MAKING MAGIC MACHINES

KRISTINA ANDERSEN
To Rosa, this is what I was doing while you slept.
Abstract

How can we design experiences that explore ideas and notions of the unknown? The aim of the work outlined here is to create short, intense, workshop-like experiences that generate strong commitments, and expose underlying personal desires as drivers for new ideas. I would like to propose a material practice, which uses open-ended making to engage in the imagination of new things. Informed by a concern or a longing, this exploration employs familiar yet mundane materials - such as candy and cardboard - through which several planes collide: the possible, the unknown, the feared and the desired. The process is aimed at allowing a broad range of knowledge to materialise, through ways that are less normative, and less constrained by commercial and technological concerns, and to emerge instead as far-fetched ideas that offer a kind of knowledge, which belongs to no one. The format has evolved over time, from relatively elaborate workshops for technology prototyping, towards the point where they are now focussed on the making of work that is about technology, rather than of technology.
Sammanfattning

Acknowledgments

You. You. I could not have done this without you, my family, my friends, my colleagues, my mentors, my people.

You stood by my shoulder at the beginning of all this, and you still do. You dragged me to faraway places and handed me the torch (my feet coloured blue with pigment as we played the game of minotaur). You walked with me up the mountain. You showed me the books. You made me tea. You let me drive the car. You handed me the broken glass and taught me when to run and when to fight.

You made me laugh when it was no laughing matter. You insisted on beauty. You went to sleep, so that I could write in the night. You travelled with me to workshops, and you stood proud when things were done. And every night we ate pizza overlooking the Bosphorus, or something like that. You made it all an adventure.

You found me, and then you found me again. You remembered. You brought the tools and the wine, and you never wavered. You trusted me to understand. You let me see everything in a new way.

You hold me up. You listen to my ideas. You let me read out loud. You know where the bodies and the treasures are buried. You stand by me, as we do this together. You journey with me.

Thank you. Thank you for the companionship, the knowledge and the love. I could not have done any of this without you.
## CONTENTS

- **Abstract**  
  - V
- **Sammanfattning**  
  - VII
- **Acknowledgments**  
  - IX

**Preface**  
1

1. **Starting Out**  
3

2. **Technology as a Magical Unknown**  
8

3. **The Missing Requirement**  
10

4. **Research Questions and Concerns**  
13
  - Associated Papers and Material  
  - 15

5. **Framework: Diffraction and Obstruction**  
17

6. **Methods for Storming**  
23

7. **Methodology**  
27

8. **Making a Magic Machine**  
30
  - Language  
  - 34
  - The Introduction  
  - 36
  - The Prompt  
  - 40
  - The Material Switch  
  - 42
  - Being Done  
  - 45
  - Description  
  - 46
  - Group Discussion  
  - 50
  - Documentation  
  - 51
  - Variation versus Structure  
  - 53

9. **Physical Outcomes**  
54
  - Complexity  
  - 55
  - Simplicity  
  - 56
  - Precision  
  - 57
  - Vagueness  
  - 58
  - Evocation  
  - 59
  - Preconception  
  - 61
  - Resilience  
  - 61
  - Limitation  
  - 63
  - Material Outcomes  
  - 63
10. Inside the Workshop Experience 65
   Contextualisation 66
   Secrecy 66
   Adjustment 67
   Emergence 68
   Exposure 69
   Friction 70
   Cohesion 72
   Rationalisation 73

11. Application and Deployment 75

12. Discussion of Emerging Elements 83
   Magic and Magical Thinking 84
   Thinking Through the Prop 85
   Leaky Objects 87
   Responsibility, Commitment and Risk 88
   Workshop as Gift Exchange 89
   Creating Design Knowledge 90

13. How to do a Magic Machine Workshop 93

14. Contribution and Conclusion 95

Postscript 101
References 103

Appendices 109
   Interviews Referenced 110
   Workshops Referenced 110
   Projects Referenced 110
   Image Credits 111
   Additional Image Documentation 112

Overview of Associated Papers 118
1: Circles and Props - Making Unknown Technology 119
2: Making Magic Machines 120
3: The Deliberate Cargocult 121
4: The Instrument as the Source of New in New Music 122
5: The Dial: Exploring Computational Strangeness 123
6: Anti-Solutionist Strategies: Seriously Silly Design Fiction 124
7: 821 words and 20 images 125

Related papers 126
Preface

Years ago, I came across a sixteenth-century recipe for lavender jelly in an archive in the Netherlands. Like many old recipes, it was just a list of ingredients and suggestions for what it might be good for. How to actually make it, would have been obvious then, but now: not so much. I spent a Christmas making lavender jelly, or rather trying to. It turns out that the addition of lemon juice is crucial. After the lavender is steeped in hot water, it is the lemon juice that turns the colour from a strange red, to what we could consider lavender blue.¹

Here is how:

1. Steep the lavender in hot water for 15 minutes to make a strong infusion.
2. Dissolve sugar and a gelling agent of your choice into the infusion making sure it does not boil.
3. Add lemon juice and watch the colour change.
4. Leave to set overnight.

Recipes are lists of words that remind us of what will be needed, and instruct us on how to go about something. They are marching orders and shopping lists, but mostly they are descriptions of time, time needed, time elapsed. Joel Ryan describes time in music like this:

_The fact is I know when. Before it happens, I know when a beat should come, I know after, when it didn’t. This knowledge is not something you can necessarily explain in words. It is something you demonstrate in playing but also listening, in enjoying music. It is the knowledge of how to make time. The proof is that with practice you get there on time, again and again._

(Ryan and Andersen 2014)

¹ This description was first published in: Andersen, K., 2017: _Making Hypothetical Technologies_, in Intersecting Art and Technology in Practice: Technne/Technique/Technology, Routledge, pp. 42-49.
It is dirty and messy in the kitchen. Every day we get up, survey the damage and start again, until the jelly is blue and no longer liquid. The knowledge of making time, of going forth, until it is right in an almost scientific notion of repeatability, of proof. Do it again, then do it again. Then, write a note to yourself, a recipe, or an instruction. First, comes the object, the notion, the timing and then the words. In Catherynne M. Valente’s book, ‘The Girl Who Fell Beneath Fairyland and Led the Revels There’, a fairy tells the girl, September:

First, you build the machine, then it tells you what it’s for. A machine is only a kind of magnet for attracting Use. That’s why we say things are Useful – because they are all full of the Use that chose them to perform itself. (Valente 2013)

This is an attempt to make sense of a similar process, which has emerged as part of my work over a long period of time. The work outlined here have mostly been conducted in settings outside of an academic context, at festivals, in classrooms and art galleries as experiences and explorations, developed iteratively over time. It is only now, after the event, that I sit down and try to understand them in a larger context.
As a student of Industrial Design in the mid 1990’s, I became deeply interested in notions of the future, or rather, the near future. It seemed as if it was right there, I experienced the design-world I was immersed in, as ‘on the threshold of revelation’, as if everything was about to change. This was the time of Philips’ Visions of the Future, MIT’s Things that Think, Thad Starner’s early experiments with VirtualBoys, and William Gibson’s Neuromancer. Concurrently, a deeply experimental turn was happening in both theatre (such as the Danish theatre, Hotel Pro Forma) and dance (such as the Belgian choreographer, Wim van de Keybus).

Together, they formed a pattern of an engaged and embodied imagination of the new. The future they proposed was not in a galaxy far away, but rather one that was explicit and inhabitable. In that sense, they were all conceptual thought experiments, but they had texture and taste; the world they suggested felt real, and it reflected directly back on my own lived experience. The lesson I took away, was that it was possible to address the world directly, to give shape to the formless, to express concerns in objects and environments.

At the same time, I was influenced by Aldo van Eyck’s books on humanist architecture, Fluxus, Situationism, and catalogues from the 1960’s like Shelter and Nomadic Furniture. From architecture, I followed the work

---

2 I use the term in reference to its use by the character Harper in Tony Kushner’s Angels of America, Part One: Millennium Approaches.
9 Aldo van Eyck, 1986, Niet om het even, wel evenwaardig; van en over Aldo van Eyck, Stichting Rotterdam-Maaskant, Rotterdam.
10 The Fluxus Reader, 1998, Editor: Ken Friedman, Academy Editions.
Fig. 01. Student work from the 1990’s.
of Future Systems\textsuperscript{14}, Diller & Scofidio\textsuperscript{15}, Coop Himmelblau\textsuperscript{16}, and Lebius Woods\textsuperscript{17}. This interest naturally spilled over into the cartoon culture of Metal Hurlant\textsuperscript{18}, Moebius\textsuperscript{19}, Enki Bilal\textsuperscript{20} and Peeters/Schuiten\textsuperscript{21}. To me, it felt as if the world was emerging in a new form, and I came out of my studies wanting to make experiences, installations and interactive objects that somehow addressed this.

After graduation, I worked for a science centre\textsuperscript{22}, experimental design companies\textsuperscript{23}, architecture offices\textsuperscript{24}, software companies\textsuperscript{25}, developing furniture\textsuperscript{26}, interfaces\textsuperscript{27}, and game concepts facilitating collaborative storytelling on mobile devices\textsuperscript{28}.

Over time, however, I found myself becoming less interested in my own personal opinions and visions and increasingly interested in creating space to investigate those of others. The process of putting this into action started in Ivrea at the Interaction Design Institute Ivrea\textsuperscript{29}, where I initiated the FARAWAY project\textsuperscript{30} together with Margot Jacobs and Laura Polazzi. We wanted to investigate the possibilities for technologies to employ

\begin{itemize}
\item[17] https://lebbeuswoods.net/, accessed 7th of June 2017.
\item[22] https://www.experimentarium.dk/, accessed 7th of June 2017.
\item[23] http://www.archilovers.com/teams/127816/idsland.html#info and http://olivierpeyricot.blogspot.nl/
\end{itemize}
non-verbal communications, to support the emotional presence between people, who are emotionally close, but physically distant. In order to do this, we decided to gather design content by conducting an experimental game of exchanging objects, inspired by Surrealist art techniques as documented in the book chapter, ‘Playing Games in the Emotional Space’ (Andersen et al 2003). I continued developing this approach in the whisper project\(^{31}\), working with Susan Kozel and Thecla Schiphorst on an installation of wearable devices that gathered and exchanged body-data.

In order to feed the design process, and to arrive at a better understanding of how such an exchange might feel, I designed a series of explorative workshop experiences, as documented in the paper, ‘Between bodies: Using experience modeling to create gestural protocols for physiological data transfer’ (Schiphorst and Andersen 2004).

Over the years that followed, I made increasing use of workshop-like formats: to influence my own design processes; to investigate and play with ideas; to support my students in designing projects; and ultimately, as a way to unlock user input and use it to express complex concepts and visions. These formats evolved over time, from relatively elaborate workshops for technology prototyping, towards the point where they are now focussed on the making of work about technology rather than of technology. This is an attempt to document and reflect upon these techniques, their origins in art and performance, and what they may be used for.

This process took place over a period of 15 years, in parallel to, and deeply influenced by, the work conducted by other designers, researchers and artists, and critical design methods such as Placebo Designs (Dunne and Raby 2002), practical methodologies like the Future Technology Workshops (Vavoula et al 2002), and techniques for inspiration and understanding of users like the Cultural Probes (Gaver et al 1999). The work is also actively informed by methods such as Body Storming (Oulasvirta et al 2003), Participatory Design (Grudin 1993), Experience Prototyping (Buchenau and Suri 2000), as well as a broad range of techniques from theatre, dance and performance, that, in turn, take inspiration from experimental theatre as exemplified by Boal (1979, 1992), the art practice of estrangement as described by Shklovsky (1917), and Dewey’s notion of experience as a process of becoming (1958).

\(^{31}\) [http://v2.nl/archive/works/whisper](http://v2.nl/archive/works/whisper), accessed 7th of June 2017.
I remain deeply indebted to my collaborators, co-authors and co-conspirators over the years, these ideas have emerged and solidified through a string of creative collaborations as illustrated by the associated papers here.

In the following chapters, I will outline my proposal as well as describe some of the background and related work.

Fig.02. Images from FARAWAY workshop.

Fig.03. Images from whisper workshops.
2. Technology as a Magical Unknown

Technology is traditionally developed in a process of gradually expanding knowledge, from which practical applications can emerge by matching technological opportunities with existing problems and market needs. However, with technological interfaces becoming more granular and complex, it becomes harder to participate in this work of imagining and providing visions for the future. As a result, new technologies and machines can become a magical unknown; we initially do not understand the scope of their functions, not only do we not know how they may subtly change our lives, but initially we may not even know what their stated purpose is.

In a paper I wrote with Audrey Samson, we described how ‘the technologies around us are moving into the microscopic range, where matter is modified on a molecular or even atomic scale, their function must increasingly be believed or assumed by the uninitiated rather than observed with the naked eye’ (Samson and Andersen 2013). The resulting, uneven, knowledge distribution was arguably always a factor of technology, but the advent of techniques such as nanotechnology and machine learning is forcing our approach from wanting to understand how a new thing works, to just wanting to understand, how it may be used.

In his article on April 11, 2017, The Dark Secret at the Heart of AI, for MIT Technology review, Will Knight writes that, ‘as the technology advances, we might soon cross some threshold beyond which using AI requires a leap of faith’ and ‘we’ve never before built machines that operate in ways their creators don’t understand (2017)’. This leaves us at a complex impasse: how can we address and design for the unknown and unknowable technological object?

As an example of a playful exploration of the issues surrounding this, James Bridle created a trap for automated cars: ‘Autonomous Trap 001, performed as a salt circle trap on Mount Parnassus, 14/3/17’32. The trap is enacted as a ritualistic act of magic, with the use of salt underlining this stance. By almost directly referencing Clarke’s notion that any ‘sufficiently advanced technology is indistinguishable from magic’ (1984), James Bridle

----

introduces the possibility that, given the above, we might be successful in addressing such technology with a new kind of counter-magic. By which power will we trap the self-driving car?

We are arriving at a point where almost all new consumer objects have a CPU (and the term *computer* to describe a device is fast becoming meaningless), the mainstream technological object has lost its established physical form (the body of a camera is no longer defined by the shape of the film and the shutter); and the feasibility of new functionality increasingly relies on our willingness to believe in, and accept yet another abstract paradigm or interface. At the same time, state-of-the-art technology has immersed us in new forms of ubiquitous interfaces and massive-scale data collection. We are, in some sense, left with our old human selves, as the remaining metric against which to design and speculate. Our hands and eyes are no more precise, and with computation systems amplifying our choices by collecting and personalising our options, we seem to be, if anything, more dependent on the whims of our own human everyday affect and emotion than before.
3. The Missing Requirement

Within the field of Human Computer Interaction, the approach to user involvement has evolved from user-testing of already designed systems, to understanding users and their context through ethnographic methods and scenarios, towards an emerging focus on developing empathy with the user’s experience of life. Wright and McCarthy state that “knowing the user” in their lived and felt life involves understanding what it feels like to be that person, what their situation is like from their own perspective’ (2008). This mirrors a similar notion in Design Research, where the role of the designer can be seen to be moving from a third-person perspective (designing for society in general) to a second-person perspective (designing with a group of people or a part of society) towards a first-person perspective (designing amongst the users in a peer-like relationship). Tomico et al describe this position as allowing ‘the designer not to be driven by his ego, but by a vision of a transcended future’, guided and owned by users and stakeholders (Tomico et al 2012).

Additionally, the understanding of the user is increasingly based on a stance, where the ‘way in which we come to understand the world, ourselves, and interaction, derives crucially from our location in a physical and social world as embodied actors’ (Harrison et al 2007), and terms such as materiality and the tactile, somatic aspect of an experience (Höök 2010), non-coercive interfaces (expression and exploration rather than compliance and efficiency) and the emotional quality of experience (Hassenzahl et al 2013) are becoming increasingly common subjects in technology and design research.

The telephone, in the form we still use as an icon, was designed to a very specific set of technical requirements. The speaker and the microphone needed to be a particular size and shape to provide resonance and be placed very near the ear and mouth, the base needed to host a dialing device, and the mode of use was itself dictated by the workings of the network (pick up, establish connection to network / wait for tone, dial number, wait for connection to be made etc.). With new technological objects less and less dependent on the physical requirements of the technology, such practical concerns no longer act as the main guide to the physical design and ultimately as an implicit instruction of use. As these objects becoming inscrutable both as technologies and designs, and their
Fig.05. Classic Telephone and iPhone 4.
use relegated to an agreed set of assumptions and Clarke’sque magic, the question arises: Can there be meaningful design explorations of such magical unknowns?

The workshop processes described in my own work are aimed at engaging non-experts in a conversation about personal technological desires and fears, to generate visions and manifestations of unknown technologies. The purpose is not to design future technological objects, but rather to gain a deeper understanding of broader cultural drifts, to channel unstable notions and desires into experimental objects and to move the design research process a step further by developing deliberate strategies for supporting user-driven visions and agendas that might provide us with an opportunity to engage and collaborate with a broader set of viewpoints and backgrounds. Such collaborations with non-experts can be seen as a type of interdisciplinarity where, according to Fuller, the point ‘is not to build on methods and insights from existing disciplines—a common, but misguided approach that mistakenly assumes combining methods makes for better knowledge. Instead, the transformative promise of interdisciplinarity lies in its capacity to interpenetrate disciplines, changing what they do by providing communicative forms and channels for re-negotiating disciplinary boundaries and generating new epistemic standards.’ (2009) or as Roland Barthes states in *Jeunes Chercheurs* (1972) ‘Interdisciplinarity consists in creating a new object that belongs to no one’.

With the traditional set of engineering requirements increasingly missing from the process through which we design new things, I would like to propose that we might engage as peers with so-called ‘users’ to create speculative and hypothetical new objects that *belong to no one* but can form the basis of both personal and shared insights and understandings.
4. Research Questions and Concerns

The aim of the work outlined here is to create short, intense workshop-like experiences that generate strong commitments and expose underlying personal desires as drivers for ideas. As such, the phenomenon under consideration is the understanding and engaging with non-experts in instinctive and emotional imagination of new things.

How can we engage with diverse groups of participants, so that they are able to effectively bring forth their intuitions and ideas into formats that are playful and low-stake? What are the nature and the purpose of such imaginations? How can we arrive at an understanding of the process that produced them? But also: How do we safeguard and scaffold the creative process of these participants? How can we ensure that the outcomes will remain objects that belong to no one\(^3\), in the sense that they are not mistaken for product ideas or design proposals, created only to be used as is in a design process? How do we capture and document the process in a manner that is user-driven and owned, and respectful to both the common creative process, and the individual concerns that the work might address?

In this process the tools available to me have been:

- Conducting workshops in order to bring forth ephemeral insights.
- Describing and interpreting these insights.
- Describing aspects of the conducted experiences as a plausible technique to bring forth such insights in other contexts.

It is important to underline again, that the outcomes, we are looking for, are artifacts that are valuable in and of themselves. They are manifestations of insights and knowledge, that may ultimately be read as design material, as well as the beginning of requirements for products. But, this is not a necessary requirement to be successful, and they are not themselves products or prototypes of products. Instead, they form an opportunity, not just look to at a subject from a different person’s perspective, but to find new ways to examine and self-examine aspects of our lives with

---

\(^3\) In the spirit of Roland Barthes essay, *Jeunes Chercheurs* (1972).
technology that may so far have escaped our attention, and might even be counter or external to a given design brief. As a result, we are not only producing design knowledge, but rather, we are attempting to engender new fields of inquiry into what forms of knowledge might be relevant to design. The value gathered is not driven by a desire to gather requirements, user scenarios and ideas for a design process of a particular technological opportunity, rather it is anchored in the ability for the workshops to allow participants to generate articulated manifestations of hopes, fears and desires, that themselves, in turn, may signal new approaches and perspectives to our everyday life with technologies. This present text sets out to enhance the understanding of how such engagements may be supported, and what knowledge they might deliver.

The specific goal is to report on a series of workshops designed to deliver complex and thought-provoking outcomes, through incorporating, and being sensitive to, techniques from performance and art.

- How can we tighten up the traditional creative workshop format so that participants are relieved from imbalances of power and knowledge, the results and documentation remains creatively in control of the participant, and the resulting objects are open for the participant to self-interpret?

- How can we free researchers and facilitators from the restrictions of result-oriented brainstorming structures, and allow them to re-interpret the context and prerequisites of their own research goals; to remain attentive to alternative framings and allow outcomes to contradict and challenge the setup of the process itself?

- How can we analyse and interpret the outcomes so that they both allow each participant to arrive at a more detailed personal insight, and can potentially inform the development of the subject at hand?

In other words, the outcomes of these workshop formats are both reflective experiences arrived at by the participants themselves during the workshop, and insights generated by the facilitator during and after the workshop. These reflect on the experience itself and might potentially inform the context of a future design development process.
In the following, I will propose that these experiences are able to: generate a high level of participation and emotional commitment to the results; create reflective experiences in and of themselves; and to produce useful indirect material for technological development processes.

**Associated Papers and Material**

This text is associated with seven publications, each describing a stage or aspect of the work conducted.


Throughout this text I will make use of examples and outcomes from a larger number of recent projects. For ease of reading I will initially focus on the instrument building workshops conducted in the contexts of the GiantSteps project, Amsterdam Dance Event, Red Bull Music Academy and the sIREN conference, the physical outcomes will be illustrated by examples from both those instrument building workshops and the Modular School project, a workshop that focuses on the imagination of small architectural interventions, while finally, the workshop experience is illustrated by examples from a workshop addressing the elderly in a city context, as described in Blythe at al in the associated paper ‘Anti-Solutionist Strategies: Seriously Silly Design Fiction’. Often the relevant workshop element forms only part of a broader project. By taking examples from a number of different projects, I am hoping to be able to show a number of specific concerns and outcomes.

Within the context of this present text, the experiences and resulting artefacts are interpreted in a personal manner with a focus on insights that reflect the technique rather than the project-specific object of study. The
overall outcome will be a reflection of the present body of work; analysis of the workshop outcomes; and finally, a set of overall concerns that may be used to further develop the strategies and techniques used here.

At the basis lies a theoretical framework of art, performance, and play theory that informs how I see the world, and in which my approach to magic, obstruction and marking takes its origin. While this is partially outlined in the associated papers, I will provide an additional high-level overview of the inspirations from these surrounding fields here.
5. Framework: Diffraction and Obstruction

Like most designers, I oscillate between reading and making. Often the objects I make can be seen as diagrams of ideas, or manifestations of the relationships between one notion and another. In a similar way I don’t read texts properly, instead the texts are like images, like scraps of colour and texture. I carry them with me, take them out, rearrange them, and reconsider them. Most snippets of texts are with me for years, worn and known. Recited quietly like curses, changing meaning over time, coming into focus and fading back into incomprehension again.

Arriving in this manner from a materialist or things-based understanding of the world, my way of reading has similarities to Karen Barad’s practices of diffractive reading: the reading of one text through another, as described in her 2003 article ‘Posthumanist Performativity’.

A diffractive methodology provides a way of attending to entanglements in reading important insights and approaches through one another.

(Karen Barad 2003)

This approach is necessary for myself to establish a theoretical framework, that resonates with my own ability to arrive at an understanding. It also allows the inclusion of emerging and dimly-held knowledge that is the main currency of my core work practice.

Diffractive reading takes its origin from Donna Haraway’s work (1992, 1997). It proposes that we may intimately diffract a text, rather than reflect upon it from a distance, as a re-focus away from traditional academic questioning. Diffraction is the, ‘mapping of interference, not of replication, reflection or reproduction. A diffraction pattern does not map where differences appear, but rather maps where the effects of difference appear’.

These effects of difference then become the focus of investigation. This allows us to pay attention to unexpected behaviours, and disturbances as they emerge and become visible. As Iris van der Tuin simply states it, ‘diffractions happen’ (van der Tuin 2016). It may be argued that diffractive questioning is the process of allowing attention and awareness of such emergent possibilities.
The original purpose of the cloud chamber was to capture and explain clouds, but its location in a lab investigating radiation allowed it to become a particle detector, a device to make visible invisibly small particles of radioactive decay. Or rather, not actually see them but at least mark their passage through the box. We see the moment as they enter the chamber leaving a trail of condensation like a high-flying jet.  

*(Ryan and Andersen 2014)*

The cloud chamber can be seen as a machine for paying attention, for allowing the awareness of the sudden visibility of an unexpected nuance. We pay attention. The phrase, ‘to pay attention’, gives an insight into itself: the attention must be *paid*, it is a resource spent and used. In this present text, I allow myself to consider my own cultural and theoretical framework as a part of a diffractive system, where the object of inquiry can form a conceptual experimental chamber, inside which, a signal may or may not resonate and be detected, as I attempt to absorb a given scientific or theoretical text.

I used to be somewhat obsessed with the Paul Klee drawing of the angel of history, Angelus Novus. Walter Benjamin writes:

> This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe, which keeps piling wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing in from Paradise; it has got caught in his wings with such a violence that the angel can no longer close them. The storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress.

*(1940)*

My initial reading of Karen Barad shed some light onto this tragic vision. She introduces the open-endedness of both the future and the past, by making a theoretical physics argument for the possibility that the past is actively determined by the present, and as a consequence what just happened can potentially change what went before (2012). This is echoed by Zizek who proposes that for each new event that we experience, our idea of what is possible is retroactively reconfigured, effectively changing the past to include the potential event that has not yet occurred (2009).
It is simply hard for us to consider a period in the past, without framing each event as a foreshadowing of what happened next. This, to me, opens up the present, as a series of moments in which we have agency, and can act, with every such act potentially altering the past, and in turn setting out new trajectories or possibilities for change. It is very much in this light, that I conduct my work.

A crucial aspect to paying attention, is time. In ‘Art as Technique’, Shklovsky insists that, ‘art exists that one may recover the sensation of life; it exists to make one feel things, to make the stone stony. The purpose of art is to impart the sensation of things as they are perceived and not as they are known. The technique of art is to make objects “unfamiliar”, to make forms difficult, to increase the difficulty and length of perception because the process of perception is an aesthetic end in itself and must be prolonged. Art is a way of experiencing the artfulness of an object: the object is not important...’ (1917). By staying longer in the zone of consideration and exploration, we are able to stay longer in the experience of art. The strategy is to obstruct and estrange the world, in order to experience it. Thus here, art is the technique of un-discovery or making the familiar unfamiliar and by staying longer in the zone of consideration and exploration, we are able to stay longer inside the experience of it. The object is only perceivable in the window between encounter and categorisation, and therefore the strategy is to extend this period through a process of obstruction and estrangement.

Choosing to approach a difficult subject in a difficult or convoluted manner is a longstanding strategy of art, where material and circumstance can be used to form such obstructions. The underlying assumption is that to free up the creative and expressive body to respond to the unanswerable, we must first busy or hurry the reasoning part of the brain, so that it will not interfere with the creative process. This is directly echoed by Rilke who, in ‘Letters to a Young Poet’, writes, ‘Be patient toward all that is unsolved in your heart and to try to love the questions themselves like locked rooms and like books that are written in a very foreign tongue’ (1903). Dewey in turn states that works of art themselves obstruct our ability to theorise about them. He calls for a restoration of the continuity of the art object itself and it’s production, between the act of experiencing art and understanding it (1958).
IMMACULATE HEART COLLEGE ART DEPARTMENT RULES

Rule 1 FIND A PLACE YOU TRUST AND THEN TRY TRUSTING IT FOR A WHILE.
Rule 2 GENERAL DUTIES OF A STUDENT: PULL EVERYTHING OUT OF YOUR TEACHER.
Rule 3 GENERAL DUTIES OF A TEACHER: PULL EVERYTHING OUT OF YOUR STUDENTS.
Rule 4 CONSIDER EVERYTHING AN EXPERIMENT.
Rule 5 BE SELF DISCIPLINED. THIS MEANS FINDING SOMEONE WISE OR SMART AND CHOOSING TO FOLLOW THEM.
Rule 6 TO BE DISCIPLINED IS TO FOLLOW IN A GOOD WAY. TO BE SELF DISCIPLINED IS TO FOLLOW IN A BETTER WAY.
Rule 7 The only rule is work.
Rule 8 IF YOU WORK IT WILL LEAD TO SOMETHING.
Rule 9 IT'S THE PEOPLE WHO DO ALL OF THE WORK ALL THE TIME WHO EVENTUALLY CATCH ON TO THINGS.
Rule 10 DON'T TRY TO CREATE AND ANALYSE AT THE SAME TIME. THEY'RE DIFFERENT PROCESSES.
Rule 11 BE HAPPY WHENEVER YOU CAN MANAGE IT.
Rule 12 ENJOY YOURSELF. IT'S LIGHTER THAN YOU THINK.
Rule 13 "WE'RE BREAKING ALL OF THE RULES. EVEN OUR OWN RULES. AND HOW DO WE DO THAT? BY LEAVING PLENTY OF ROOM FOR X QUANTITIES." JOHN CAGE
Rule 14 HELPFUL HINTS: ALWAYS BE AROUND, COME OR GO TO EVERYTHING. ALWAYS GO TO CLASSES. READ ANYTHING YOU CAN GET YOUR HANDS ON. LOOK AT MOVIES CAREFULLY OFTEN. SAVE EVERYTHING - IT MIGHT COME IN HANDY LATER.
Rule 15 THERE SHOULD BE NEW RULES NEXT WEEK.

Fig.06. Immaculate Heart College Art Department rules by Sister Corita Kent.
Whilst teaching at the Immaculate Heart College in the 1960’s, Sister Corita Kent set about writing a set of explicit rules to try and capture this approach. Here, amongst pleas to turn up for class, we see rules that call for open-ended making; and a separation of creation and analysis (rule 8); alongside a reference to John Cage (see Fig.06).

Cage’s approach to composition and art was based on games of chance, combined with very strong compositional rules, and an equally strong commitment to performance. As an example of this, the original instruction, for the piece ‘0.00’ from 1962, reads: ‘In a situation provided with maximum amplification, perform a disciplined action’. By combining complete performative openness with strong rules for how this openness should be executed, Cage effectively renders sound ‘strange’, and thus, it becomes perceivable in Shklovsky’s definition (as above). Such art experiences, particularly when they involve live actions such as performance, intervention or a happening, can be seen as closed experiences with a beginning and an end, reminiscent of Dewey’s ideas of closure, where in order for an experience to distinguish itself in the never-ending flow of events and changes, it must come to some kind of conclusion or fulfilment. John Dewey (1934) describes this demarcation of an experience in the general stream of experiences as: ‘A piece of work is finished in a way that is satisfactory; a problem receives its solution; a game is played through; a situation, whether that of eating a meal, playing a game of chess, carrying on a conversation, writing a book, or taking part in a political campaign, is so rounded out that its close is a consummation and not a cessation’.

This leads us to Caillois, who begins his book ‘Man, Play, Games’ (1961) by quoting Huzinga’s definition of play (1950): ‘Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside “ordinary” life as being “not serious,” but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.’ In the book, Caillois goes on to specify a set of core characteristics of play that we will return to in chapter 8.
In Rebecca Solnit’s book ‘A Field Guide to Getting Lost’, she writes: ‘It is the job of artists to open doors and invite in prophesies, the unknown, the unfamiliar; it’s where their work comes from, although its arrival signals the beginning of the long disciplined process of making it their own. Scientists too, as J. Robert Oppenheimer once remarked, “live always at the ‘edge of mystery’ — the boundary of the unknown.” But they transform the unknown into the known, haul it in like fishermen; artists get you out into that dark sea’ (2005). To me, this carries an echo of Whitehead’s remark that ‘a traveller, who has lost his way, should not ask, Where am I? What he really wants to know is, Where are the other places?’ (1929), and resonates through to Stuart Firestein’s book, ‘Ignorance: How it Drives Science’, in which he declares that it is the not-knowing is what drives both the arts and the sciences (2012).

So, these then are our starting points and marching orders: Approach the world in its difficulty with attention and timing, perform actions deliberately and with maximum amplification, open and close each experience as you would a book.
6. Methods for Storming

As these approaches translate into the world of design, we encounter them again as techniques to encourage creativity, in the form of methods of chance (Cage), obstruction (Shklovsky) and improvisation (Boal). As the central example of this, a brainstorm is an improvisational technique aimed at finding solutions to a problem by generating large amounts of quick and spontaneous ideas. The basic rules are to defer judgment, and to reach for quantity (Osborn 1963). Making use of brainstorms and other language-based techniques to elicit creative responses from participants, is an established and much used method in technology development, design and human computer interaction.

Workshops are present in a broad set of methodologies such as Participatory Design, Design Thinking\(^{34}\), as well as various kinds of requirement engineering and usability testing. The goals for these workshops tend to fall into three areas: looking for inspiration and context for a design project; gathering requirements from users; and letting users try out an idea, prototype or design proposal.

Participatory Design has developed to involve users, not only in the co-design of a given project alongside designers, but in the control and questioning of the framing of entire projects (Ehn 1993). Whereas Design Thinking, on the other hand, invites users to make use of the skill set of designers and as visitors to take part in aspects of the project, that would normally be the work of designers: brainstorming, ideation, prototyping and its associated wicked problems and aha moments (Buchanan 1992).

In the arts, collaboration with audiences has a long history. An example of this is the theatre work of Augusto Boal in the ‘Theatre of the Oppressed’, where a theatre group will play a scenario, and then open it up for the audience to replay the narrative with different outcomes. In this way, the world is imagined as upside down, and the audience is asked be agents of change in order to engage in the re-versioning of the play. The rules are that the protagonist has options; the antagonist can change and an ally can

\(^{34}\)‘Design thinking is a human-centred approach to innovation that draws from the designer’s toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.’ Tim Brown, IDEO from https://www.ideou.com/pages/design-thinking, accessed 7th of June 2017.
change the course of action (Boal 1992). These types of theatre tactics are deliberately designed, to address power imbalances both between protagonists and antagonists within the fictional scenario, but also between the actors and audience members within the theatrical situation itself. As such, they are used in political theatre to empower marginalised populations and their allies, by rehearsing an essentially practical technique of creative collaborative problem solving.

Strategies like these are directly related to a broad range of techniques in theatre and dance, where the work of creating the performance itself is done in open collaborations. Another relevant technique is marking in dance. When dancers mark, they ‘execute a dance phrase in a simplified, schematic or abstracted form’ (2011). In ‘How Marking in Dance Constitutes Thinking with the Body’, Kirsh describes marking, as a way to think with the body as ‘a body-in-motion can serve as a dynamic vehicle of thought for a dancer, much like trying out a musical phrase on a piano might help a composer think compositionally’. This mirrors the way props are used in theatre to embody complex narrative gestures and facilitate storytelling. Such theatrical props present as a kind of container of symbolic content (Storm 2001). In a sense they take part in the marking of narrative and in this way, can be seen as tools for interacting with the overall context of an idea (Howard et al 2002).

The open participatory performances, like those created by Boal through the 1970’s and 1980’s, are brought back into focus by Ranciere in his book ‘The Emancipated Spectator’, in which he writes of the paradox of spectatorship: ‘Viewing is the opposite of knowing: the spectator is held before an appearance in a state of ignorance about the process of production of this appearance and about the reality it conceals. Second, it is the opposite of acting: the spectator remains immobile in her seat, passive. To be a spectator is to be separated from both the capacity to know and the power to act.’ He goes on to call for a ‘theatre without spectators, where those in attendance learn from as opposed to being seduced by images; where they become active participants as opposed to passive voyeurs’ (2009).

It is clear, how such participatory performance strategies could inform a workshop or other forms for creative collaborations. The closest established design technique of this kind is that of Body Storming, where participants are asked to imagine that a product or environment already exists, and
are encouraged to explore what an interaction might look like by moving around and acting out scenarios (Oulasvirta et al 2003).

The tactic of Placebo Design is another example of letting the inspiration from art and performative practices influence the development of a design process. In 2002, I took part in a workshop conducted by Fiona Raby and Anthony Dunne, as a part of ‘Designing Desire’ at Ivrea. I remember it like this: We were asked to identify a personal fear, and then come up with designs or interventions that addressed that fear without solving it.

One researcher had the fear that his home was not really a home (but only a place where he lived), and his solution was to make a ‘home’ sign, which could be placed on a specially designed shelf. He would then be able to actively label the flat ‘home’ in the moments, when it felt homely. The sign facilitated him in paying attention to the feeling without solving the deeper life choices that was maybe driving his original concern.

Another group of researchers identified a fear of the local cleaning ladies, who generally insisted on moving things around. The design intervention was two sets of small round stickers in two colours. You would identify a number of embattled objects, mark their position in ‘your’ colour, before going to work, then using the other set of stickers to mark, where the objects had been moved to in your absence. Over time a delineation of the battleground of your home would be visible, making the two trench positions clear.

The outcomes of this workshop were light-hearted, but they also touched upon the deep alienation and displacement most of us felt living temporarily in a small Italian town. The workshop allowed these feelings to be seen and marked. We could not fix the underlying issues - they were structural and complex - but through this process, we were able to begin to grapple with our unease.

In the ‘Futures and Alternative Nows’ chapter of Moggridge’s ‘Designing Interactions’, Dunne and Raby states their aim as: ‘We’re not interested in futures, as in technical futures or scientific futures or technological futures, but more in alternative nows: how things could be right now if we had different values. It’s about the psychological approach to design; psychological need and complex need. Instead of need being purely functional, we are looking at the idea of a more emotional and psycho-
logical need (Moggridge and Atkinson 2007).’ In other words, they were not aiming for their workshop experience to be a method for designing a future product, instead they were interested in making those underlying issues and values visible.

In a similar vein, Vines et al proposed the use of ‘questionable concepts’, where sets of deliberately flawed design solutions, such as an exploding handbag to deter thieves, are introduced into workshop sessions as a kind of prop, to facilitate critique and discussion (2012). While Gerber stays closer to the theatrical tradition in her exploration of how techniques of improvisation can be adopted in design, by focussing on three instructions: be obvious; accept invitations; and fail cheerfully (2007).

My own work in this area, deeply indebted to these techniques and strategies, has focussed of bringing the openness of improvised theatre and dance into a physically focussed making process, that allows for the making of speculative and hypothetical objects, which may then function as anchoring points for conversation and discovery. As such, my approach and sensibilities are deeply formed by these storming methods, and take their starting point in a shared acknowledgement of the importance of improvisation, playfulness and embodied thought.
7. Methodology

The work described in this text and its associated papers, is overwhelmingly conducted in settings outside of an academic research context. Instead of starting with a research question per se, my inquiry started as a practical concern: When teaching design and idea-generation, I was struck at how uneven my students’ access to technical expertise was. As a result, they would often stay within their own expertise and propose technologies that were in fact already in existence (remote climate control for the home), consisted of minor improvements to existing products (the phone knows you are in a meeting and will mute itself) or the combination of two existing functions (the lamp is also a communication device).

I started using brainstorming, mood-boards and games of chance, to try and diversify these outcomes, and over time I experimented with body-storming, open-ended making, technological prototyping with electronics kits, and no-tech prototyping. In Ivrea, we made use of surrealist art games to gather information for our 2001 project FARAWAY (Andersen et al 2003), in the 2003 whisper project, we used low- and no-tech experience prototyping to model a complex system that was not yet build (Schiphorst and Andersen 2004). The first Magic Machine workshop was conducted in 2007, as part of the Amber Festival in the Museum of Modern Art, Istanbul. This initial version was repeated in 2009, at Transmediale in Berlin 35 and described in the paper, Making Magic Machines (Andersen 2013). Since then, a stable core technique has emerged, which has been used in a large set of projects and contexts.

My knowledge contribution here is this emergent technique, and the qualities of its associated body of outcomes.

At its core, it is a dual process of making explorative objects and interpreting these in a structured manner. Where the making is introverted and personal, supported by prompts, material and timing, the interpretation is supported by the shift to an extrovert performative experience. The aim of the technique is to support both these acts in order to generate outcomes with a specific set of qualities.

These qualities are hinted at in the title: they are *magic* in the sense that they are extraordinary, surprising and novel, they are *machines* in the sense that they are man-made devices and finally they are *magic machines* in the sense that they suggest objects of extraordinary ability that reflect ephemeral and personal concerns.

The workshop technique is explicitly designed to generate outcomes that touch upon the unknown, and allow glimpses of what might be. The following elements of proof are brought forward here to support my position:

a. A workshop example, alongside descriptions of the influences and concerns that informed each step of the process (see chapter 8, ‘Making a Magic Machine’).

b. Examples of outcomes in the form of artefacts, analysed in terms of scope, execution, communication and material response (see chapter 9, ‘Physical Outcomes’).

c. Examples of outcomes in the form of participant feedback, reflecting on the experience of the stages of the workshop process (see chapter 10, ‘Inside the Workshop Experience’)

and finally...

d. An overview of some of the contexts in which the technique has been used (see chapter 11, ‘Application and Deployment’).

Together with the examples of use in the associated papers, I will try to show that this technique reliably generates objects of high complexity and a situation of interpretation that is meaningful to the participants. In the following, I will describe a core version of the workshop technique; outline the considerations that went into each step, and where possible, share my references and inspirations.
Fig. 07. Workshop at Transmediale 2009.
8. Making a Magic Machine

In the following I will take example in the instrument design version of the Magic Machine workshop. The Magic Machine workshops have developed from project to project, and for each situation the format is modified slightly to account for themes, participants and context. For ease of reading, in the next three chapters I will primarily take examples from recent workshops, conducted from 2015-17.

A group of people are gathered in a simple room; they are musicians, DJs and instrument builders; they have concerns and questions about their own work; they are not sure what they are about to do. The experience takes the form of a workshop, where the participants are asked to:

- Draw the sound you want to make on your hand with a marker. Do not discuss or explain this. (Fig.08.)
- Using only the materials present in the room (cardboard, wire, string, metal, tape) build the machine or instrument that seems potentially able to make that sound. (Fig.09.)
- In the group, take turns to 'play' the instrument, explaining which gestures creates which sounds and how the object is handled and manipulated. (Fig.10.)

Fig.08. Drawing the sound you want to make (ADE 2016).
There is then a group discussion aimed at investigating how each instrument model illuminates and informs a potentially ‘real’ instrument in the form of a studio group critique.

This version is designed to encourage the imagination of an instrument, other versions support the creation of other outcomes, a number of factors, however, in the workshop remain stable:

1. **The situation:** The session is conducted with a small group of participants (about 12). The location is a relatively quiet space with a large working table, where a limited assortment of materials and tools are collected. An early version of the following steps was first published in the paper, ‘Circles and Props’ (Andersen ad Wilde 2012).

2. **Introduction.**

3. The participants are provided with a prompt. This can be a selection of words or artefacts from which: they are asked to pick one (Andersen ad Wilde 2012); or a very quick task to draw (Andersen 2014); imagine a situation (Je Eigen Gang Gaan / The Modular School); or write a short note (Blythe et al 2016).

4. The participants are asked to use the available materials to **build** the ‘machine’ that addresses the prompt.

5. Participants are then asked to **present** their ‘machine’ to the rest of the group as a performance or demonstration.

6. Each presentation is **discussed** and questioned in the group.

7. Each ‘machine’ is photographed and **documented**.

8. **Timekeeping and pace:** Throughout the process a high pace is maintained. Ten minutes into the start of the workshop, the first two steps should be completed, and the third initiated. The third step - making - takes thirty to forty five minutes depending on the group, it is closed then the machines are deemed to be **done**. The presentation and discussion stages (four and five) are dependent on the number of machines that are to be discussed, and the entire workshop generally concludes around the one- to two-hour mark.

---

36 An early version of the following steps was first published in the associated article, ‘Circles and Props’.

Fig.09. Making the machine that makes the sound (ADE 2016).
Fig.10. Presenting and playing the machine (ADE 2016).
Each workshop element is designed to encourage an aspect of the engagement or to counteract a concern. Overall the process is a way to sneak up on ourselves, to be caught unaware and unselfconscious for a moment. The aim is to elicit nuanced and imaginative responses that challenge and stretch, what we consider possible. The experience takes the participant through a rapid series of formalised conceptual shifts, each drawing on notions from theatre and performance theory, game play and psychology.

The main component is a series of estrangement switches that shift the mindset of the group away from the predictable, and toward a temporary moment of otherness. An estrangement switch is a single turn of making strange, in the manner of Shklovsky’s strategies (see above). It functions by turning expectations upside down, and can take the form of a change of material, scale or context. As a result, the object of investigation is turned strange, and can now be experienced anew.

In the following, I will describe each of the steps, in light of the underlying concern, reference or experience that formed them.

**Language**

Over time, the language used in the workshops has been modified and adjusted. Where, I would in the beginning, use words such as technology, future and design, I found that such phrasing limited participants in the following ways:

By specifying the subject at hand as technology, participants would tend to limit themselves to techniques they already considered technological; overlooking social and creative techniques; and, tending to propose ideas that were in fact already available, or at least completely possible with the current technology available.

Equally the word future, would tend to evoke a cinematic science fiction type of vision, focussing on cultural tropes such as food pills, robot butlers, jetpacks or brains in vats. Whilst entertaining, these kinds of ideas are already well rehearsed inside our culture, and do not tend to bring forth new insights.

---

The word *design* was simply abandoned as a way to remove the pressure on the participant to come up with a *good idea*. A design vision can imply a strong concept; a neat execution; and ultimately, an idea that *will be the next big thing*. This would tend to put participants under strain to perform, and prolong the hesitation period before building and making.

Instead, the word *magic* is used deliberately to introduce the notion of new, powerful and unknown. This approach is similar to that of Auger and Loizeau in their analysis of the robot as a societal and cultural reflection on our dreams and aspirations: ‘The robot can reflect the current state of technological development, our hopes for that technology and also our fears; fundamentally though after almost a century of media depictions and public demonstrations, the robot is yet to enter our homes and lives in any meaningful way’ (Auger and Loizeau 2011). By substituting the word *technology* with *magic* and *machine*, we are opening up the query to reach beyond the adjacent possible to our current technologies, with *magic* referring strongly back to Arthur C. Clarke understanding of technology (Clarke 1984). Magic, in this context, refers to the desired not-yet-understood ability of future technology and *machine* to its embodiment and physical interface to the human user. In some versions of the workshop, I use different words, like *hypothetical* or *speculative*, with certain groups of participants such words fill a similar meaning as *magic*.

Equally, the word *machine* evokes something very broad and mechanical/physical. If I am to be absolutely honest, I think the inspiration came from ‘Professor Balthazar’, a Croatian animation for children that I used to watch as a child: In each episode Professor Balthazar is confronted with a problem, thinks about it, and then has a machine produce a liquid potion that when poured onto the ground produces a machine which solves the original issue. No matter the problem, the solution is always a *machine*. The word, machine provides us with a placeholder for *a thing that does something*. Corbusier famously described buildings as *machines for living*, and following this example, we can imagine a very wide selection of human constructions and designs as *machines*. The word also echoes Auger and Loizeau in the description of the robot above: the machine is a human-made technological device, evoking both fear and longing as we project it into the future and come up with uses for it in the manner of Valente’s fairy, quoted in the introduction (2011).

The introduction functions as the drawing of a magic circle or the beginning of a game, and as such it serves a number of roles. In a theatrical sense, it declares that something playful is beginning. Caillois specifies a number of characteristics for games: They are engaged in, by choice; they are separate from the routine of life and occupy their own time and space; they are uncertain - the results cannot be predetermined, and the players’ initiative is therefore required; they are unproductive - they create no
wealth and end as they begin; they are governed by strict rules that suspend ordinary laws and behaviors; and, finally, they involve make-believe that confirms the existence of imagined realities that may be set against real life (1961). The introduction is short and practical and simply aims to mark the beginning of an experience, which is out of the ordinary in a manner similar to the games Cailliois describes. It is the first hint at the fact that the workshop will be governed by strict rules, and it provides the first step towards a shared social contract within the group.

In an interview conducted in the process of writing this text, Matt Adams from Blast Theory\(^{40}\) describes shared social contracts in the following way: ‘if you meet someone at a party, there’s a negotiation there about what kind of conversation are we going to have? What rules apply, what degree of latitude is there? It’s a curiously natural thing in some ways, in that we know how to handle these forms of social negotiation, and then it’s curiously structured in that, of course there’s a kind of power relationship, and there’s a level of information on one side that is much greater than on the other side, and you have to sort of trust like an audience member, and engage like an interlocutor’ (See interview details in the Appendices). In a similar way, the introduction in effect sets the scene for such a trust/engagement relationship between the facilitator and the participants in the workshops.

The first versions of the introduction appeared as invitation cards for the FARAWAY project (Andersen et al 2003), and as scripts for the whisper project workshops (Schiphorst and Andersen 2004). They were written as a way to make sure that we did not inadvertently tell the participants how to react. Or rather, by setting out the rules of the engagement in a very explicit way, we wanted to minimise the unspoken biasing of a very open set of rules. Careful attention was taken to make sure that the introduction used ordinary language and was inviting; yet short and determined in the wording.

Over time the introduction has become shorter and shorter, it is still delivered in a strong and confident manner, but the main quality is to close the deal on the social contract, take responsibility for what is about to unfold and then move very quickly on to the next step, the prompt.

\(^{40}\) http://www.blasttheory.co.uk/, accessed 7th of June 2017.
first draft:

welcome to the mutate experience
	his is an experience in two parts

for the first part we will ask you to put on the shirts
that we handout

you can help each other buttoning up
it is ok to talk and make noise
[as needed] 👀

please work together with your partner to explore the space

now detach yourself yourself from each other using the
velcro tabs

we are handing out additional velcro tabs
use these to find ways to attach yourself to yourself or to
others in ‘mutated’ ways

explore the space together
<15 min?>

please take a moment to fill out the cards
[hands out card 1]
[collects card 1]

we will now be handing out gsr’s for the second part. gsr
means galvanic skin response. we will help you fit these
on.

gsr’s are good for listening to the inside, through your
skin. you can listen to your affect, your reaction your
emotional state.

listen to yourself
listen to the other

please take a moment to make notes in the notebook, as you
experience.
[15 min?]
an invitation to the game of

THIS IS HOW I FEEL

You find yourself in a small town. You did not use to live here.
You arrived from somewhere else. Let’s call it
BiggerCity. You left someone behind. Let’s call that person
DistantOne.

THERE IS A BOX ON YOUR TABLE

Unwrap the box. Open the Box.
Taste a Leone. Empty the rest onto the table.

Take the weekend. Ask yourself how you are feeling. You want to
send this feeling to DistantOne. What does this feeling look like?
Can you taste it? Can you smell it?

Take this feeling and put it in the box. What would you call this
feeling. Put the name of the feeling on the outside of the box.

Leave the box on your desk on Monday morning.

~ IF ONLY ~
game .01

Fig. 14. Invitation from FARAWAY project.
The Prompt

The prompt has two important functions. First, it situates the work in a particular thematic context: in the OWL Circles, the combination of picking a desire and identifying a place on the body, primes participants towards the making of something wearable (Andersen and Wilde 2014), in the Anti-solutionist workshop the definition of a personal fear of ageing focuses the participants towards empathy and personal commitment towards this user group (Blythe et al 2016), and finally in the various instrument building workshops the drawing of a sound shortcuts the genre definitions, and provides a shorthand for the complex questions around artistic goals (Andersen and Knees 2016).

Secondly and equally important, the prompt provides us with, what the artists from Blast Theory would call a red spot experience. The red spot is an initial goal in an interactive piece that tests competence and establishes confidence, acting as an onramp to an experience. By setting a clear, achievable goal, it allows participants to begin a positive feedback loop or, if they falter, to signal the need for additional support. Matt Adams says: ‘We also came onto this red spot idea, when doing Uncle Roy All Around You in 2003, at the ICA in London for the first time. What we realised is that you just need, and this is stolen pretty much directly from game design, to set up a task early that enables you to test your competence, and gives you confidence, because you get a positive feedback loop. Positive feedback loops are so important in all forms of game design, and I have sort of half a hunch that we might have even talked about the first Tomb Raider game, where Lara Croft has sort of an assault course in the back garden of her stately home, and you go out to the assault course and try things out there before you go out on an adventure+.’

The red dot can be seen as an initial action in a performative experience that indicates whether participants are in or out. By forcing a strong initial choice, it becomes clear if a participant is committed to the process, or will require further support. It also makes it easier to step to the next stage of the experience since the first creative decision has already been made, and the haste in which this commitment was made acts as an estrangement switch in itself.

41 See details of interviews conducted in the Appendices.
The prompt provides a fast, and seemingly random, task that frames the subject of *what we are about to do*, whilst being very easy to execute. To ask a musician to draw the sound, they are looking for, with permanent marker on their own hand, is a serious *and* absurd request. It is both impossible to imagine (you might not actively know what you want) *and* impossible to execute (the drawing of sound) and the tools themselves (hand and permanent marker) are boundary crossing. In this way, they work together as a Surrealist challenge (Brotchie 2004): Do something difficult *and* do it in a difficult way.

The traditional interpretation of such a Surrealist challenge is that these two possibilities somehow cancel each other out and will ultimately form an executable task. Where the participants in the FARAWAY project (see Fig.14. above) was given a weekend to execute the first task (express how you feel in a candy box), over the years it has been my experience that the shorter the available time is, the easier it is to execute a prompt.

The imposed speed of the execution appears to free the participant up, and the material allows for very little pre-planning and post editing of the result: There is little room for hesitation and no undo. The drawing provides a number of risks (you must express something you might not know, you must draw on your skin with a permanent marker), but the forced material format and the haste allow the participant to execute the prompt as a functional *red dot* experience.

![Fig.15. Drawing the sound (ADE 2016).](image-url)
In a way the drawing was what surprised me. I improvised it, and then the sculpture is merely a translation of the drawing.

Participant M, Edinburgh 2017

The participant quote above illustrates this, but examples of this thinking can be found in many branches of the arts, such as the poem, East Coker from ‘The Four Quartets’ by T.S. Eliot, a contemporary to the Surrealists:

You say I am repeating
Something I have said before. I shall say it again,
Shall I say it again? In order to arrive there,
To arrive where you are, to get from where you are not,
You must go by a way wherein there is no ecstasy.
In order to arrive at what you do not know
You must go by a way which is the way of ignorance.
In order to possess what you do not possess
You must go by the way of dispossession.
In order to arrive at what you are not
You must go through the way in which you are not.
And what you do not know is the only thing you know
And what you own is what you do not own
And where you are is where you are not.

(1947)

Once the participant has drawn the sound, the context for the engagement is clear, and the commitment to the experience is made. The social contract is cemented, both between the facilitator and participant, and amongst the group of participants themselves.

The Material Switch

The participants are now asked to use the available materials to build the machine that addresses the prompt. This is a difficult task. The content of the prompt must be translated into an imagination of the device that produces it, and the participants are provided with a very specific selection of materials with which to build it. This shift forms an estrangement switch, and the strongly curated material selection available provides an immediate other estrangement switch.

Over the years, the selection of materials provided has been pared down from a wide range of structural possibilities (OWL), to materials with no inherent acoustic properties (GiantSteps). In the OWL Circles, we
provided a broad selection of recycled materials, while making sure that they would all be white or natural (wood or cardboard). We did this to avoid the drawing of screens or buttons to indicate technology. Conversely, we wanted to encourage a situation where the function and capabilities of each proposed object were expressed in the form itself. This echoes the classic form follows function stance from Modernist architecture, where the use of additional ornament is avoided. In this context, it is done to counteract the tendency of adding a black box technological function to an already established form.

In the various instrument building workshops, it has become clear that the materials used should not have any acoustic properties. When asking musicians to imagine machines that make sound, the overriding temptation is to build an actual acoustic instrument, and while this is interesting, it does not allow the technological/magical matter to truly inform the instrument concept. In other words, acoustic instruments seldom use technology as their base matter, and instead focus on sound modification and amplification. In most electronic music, the raw material of the sound is instead comprised of a set of digital assets, modified through software and hardware. In order for such a system to become an instrument (rather than an interface), a conceptual set of decisions must be made, forming a kind of conceptual acoustics, which might reference the form of the traditional instrument, but is in fact entirely made out of non-acoustic material. (Andersen and Torre 2017, Andersen and Gibson 2017).

In a similar way, each project theme and group of participants come to the workshop experiences with an established notion of how we do things. For this reason, the design of each workshop experience involves careful consideration of what these priors might be, and how they may be creatively obstructed. The material choices represent a chance to push against such preconceptions; in order to reach beyond the well-worn and already considered types of outcomes. In other words, by making it very hard to construct boxes, screens and buttons, participants are encouraged to consider other ways to express interfaces to their ‘machine’. Since there is no technological material present (in the form of prototyping boards etc.), the technological concept becomes focussed on what it does rather than trying to execute a novel set of functionalities from a well known, existing, technological paradigm.
By carefully curating the materials we work with, we create slightly different artistic obstructions, as appropriate for each project and participant group. Each material will have a tendency to pull the outcomes towards a particular direction. By providing limited and challenging materials, we are exaggerating this effect to such a degree that the resulting participant-made thing must be created against the given material.

The idea itself must have enough force to emerge despite the material limitations. Again this frees up the participant: Since the materials provide a strong force on the result, the pressure to skilfully produce something beautiful and well crafted is lessened, and it becomes harder to tell the difference between an experienced maker and a novice.

_I blame the supplier of the materials._

_Workshop participant, Edinburgh, 2017_

This provides participants with a creative liminal space in which to work. They are asked to respond to difficult creative tasks, and they are made to execute them quickly with suboptimal materials and tools. Instead of making the experience harder, this appears to free up a certain playfulness (as illustrated by the participant quotes above and below).

_We are both taking it very seriously_
_and at the same time, not seriously at all._

_Workshop participant, Edinburgh, 2017_

During the making process, the conversation in the group is relaxed and practical. The tools are shared, and the conversation is centred on materials and techniques. A strong observation is that there is next to no conversations about the machine being built, each participant shares space and tools, but essentially works individually in a focussed manner reminiscent of a sewing circle or a crafting bee, and this continues throughout this section of the workshop. This is an emergent, observed pattern of behaviour, and my intuition is that the initial, creative challenge, the fragility of the ideas and the difficulty of the material, conspires to temporarily mute both the internal monologue of justification, and the desire to explain and narrate the process to others.
**Being Done**

Another consistent observation is that there is a clear moment of *being done*. This appears to be an instinctual knowing, and it is very apparent to the facilitator. Occasionally a participant will start a new *machine* and then build on it until this one too, is *done*. The making process is practical and instinctive, and it is up to the participants themselves to know and signal, when they are finished building. This appears similar to the process of musical improvisation, where the musician not only *knows when* (Ryan 2015), but also intuits (in what appears as wordless communication with both fellow musicians and the audience) when a segment or piece is *done*.

*It found its final form once I had finished attaching all parts that I had imagined adding. Somehow this seemed to occur around the same time as other participants.*

*Participant L, Edinburgh 2017*

This aspect of the making process was never designed and is a surprise to me every time it occurs. Considering that the participants are building an object with very limited instruction, and a period of pre-consideration that is concluded in less than ten minutes, the emergent moment of being done is a factor in each workshop. We have also observed a certain amount of group thinking in the timing of this, once one or two participants appear to be finishing their objects, it encourages the rest of the group to follow. As a result, the group is often *done* at roughly the same time.

One way to look at this is to connect it to the skill of pattern recognition. I would like to propose that the feeling of *being done* may be related to the moment, the maker looks at the self-built thing, and recognises it as a *something*. The making process itself tends to be made up of periods of detailed and focussed attention on the skills and materials available, for instance, to attach a piece of cardboard to another piece of cardboard, and these periods are interspersed with moments of observation and consideration, where the work-in-progress is considered as a whole, and the maker may ask: Am I done? Does this object ask for more work? It is in the recognition of the emergent object as a whole, rather than a collection of material fragments, that the maker may be able to declare him, or herself, *done*.
Description

Once the group has finished building the prototypes, the facilitator picks a participant and issues an invitation: ‘Please, stand up, tell us the name of the machine, and show us how it works’. This move has not been announced before, and participants are often taken by surprise. In the case of the instrument workshops, the participant is encouraged to first show the sound (drawn on the hand or on a small piece of paper), and then play the instrument. In effect, the participants are asked to use their self-built machines as props, and to improvise an associated cognitive walkthrough.

A cognitive walkthrough is a usability inspection method or technique for identifying issues within a system, the user will be asked to think aloud, while executing a task as a way to identify usability issues (Lewis 1982). In this context, it is framed as a performative moment, or alternatively in the case of non-performers, as an elevator pitch.

The energy shift inherent in changing from an internal wordless making process to an external performative presentation, is significant and often perceived as high risk. It generates a high level of focus and attention, as Joel Ryan describes: ‘the performance itself becomes the test bed, where the unexpected curves into your plans and you are forced to reconsider everything; from your premises to the gage of wire in your cables’ (Ryan and Andersen 2014).
Fig. 17. Object under consideration (GiantSteps 2014).

Fig. 18. Object considered ‘done’ (GiantSteps 2014).
This shift of attention from contemplation to pitching, is made even more urgent by the requirement to name the self-made object. This is a well-established performative strategy in music and theatre improvisation, and even in design brainstorms. It creates a situation in which the participant is required to *rehearse* (Foverskov and Binder 2009) the use of the machine whilst describing it. In many ways, this is similar to the usability strategies of ‘paper-prototypes’ (Sefelin et al 2003) or ‘wizard of oz’ (Kelley 1983, Dahlbäck et al. 1993), where this type of inquiry could be used to investigate workflow strategies and potential cognitive and conceptual shortcomings in a proposed interface or set up.

Until this point, the workshop has remained fairly wordless, with the focus on making, and the practical challenges inherent to this. By creating a situation, where we are suddenly forced to verbalise the outcome of the making process, we are essentially creating a moment of verbal improvisation. As language floods in, the participants can be observed surprising themselves with their own words. By controlling and excluding language from the central making part of the workshop, an intuitive and improvised spoken-word event emerges, creating a set of post-hoc rationalisations and reasoning, driven by an on-the-spot interpretation of the self-built machine. I would like to argue that a considerable amount of embodied knowledge and insights have been gathered during the making process. The presentation forms an opportunity to name and identify some of these, and in effect translate them into language and begin to reason about them.

By postponing the moment, where we talk about the new object, until after it has taken some kind of temporary, physical, form, we circumvent habitual internal monologues, which might in effect mirror the habitual movement patterns described by Höök (2010). To break away from such patterns requires effort and mental strain. It could be argued that the entire workshop format is set up in order to ease and facilitate this work. The turn towards language can be seen as an opportunity to collapse embodied, emotional and intellectual reasoning into one tentative set of words delivered in a live improvised presentation.

Fig. 19. Presenting the machine (ADE 2016).

Fig. 20. Paying attention to a workshop presentation (RBMA 2015 Paris).
In that sense, the entire process can be seen as a ‘head-fake’ (Pausch 2008), an elaborate system that keeps us busy and engaged, whilst distracting us from the real work taking place. The resulting objects are experimental prototypes of technological matter, which allow analysis and meaning to be specified through physical and tactile interaction with the object itself.

**Group Discussion**

After each presentation, the facilitator and the group engage with the self-made object and ask questions, in the manner of a traditional studio critique (Schön 1984). This conversation is held in ordinary, everyday language, avoiding technical jargon and approaching the object as a given: it is, whatever the participant says it is. The conversation is held on the premise of the participant, taking the present ideas seriously, regardless of how absurd and extreme, they might be. The facilitator aims to avoid evaluation, meta-commentary and irony, aiming instead to facilitate a deepening of the concept, and if possible, a clarification of its scope.

Once the participant has presented and thereby declared the identity of the thing, the ensuing conversation is focussed on investigating it and deepening the concepts that it represents.

This is done with the following questions in mind:

- Which modes of interaction are present?
- Is it reminiscent of existing things?
- Can it be evaluated in terms of plausibility, intimacy, scale and range?
- Is the proposed functionality emerging from, or in contrast to, its physical form?
- Does it offer affordances that open up new avenues for explorations?

These questions are deliberately technical in nature, in fact they are similar to the sorts of questions one might ask of any design proposal. This shift in tone functions as the last estrangement switch. By shifting straight into a serious and technical discussion, the participants are encouraged to look at their own prototype with a different perspective. If we assume for a moment that this thing is a viable functioning technological
object, what are the exact edges of its functionality? How is it turned on and off? What material is it made from? And if this can exist, what other things might be possible?

The model object itself is created out of a quick intuition or a concern, which is then addressed through its own thingness and ultimately its intrinsic existence as a material technological object. In other words, a particular line of inquiry is investigated through the making and activating of each experimental and explorative object. These can then be evaluated and tested within an essentially theatrical experience, as if they are what they say they are.

In this manner, we build up an array of possible futures and their dystopic or idealistic possibilities. The final conversation allows the description of the object to develop, and as this happens, we pay attention to the process as it unfolds, or as Ingold states in ‘The Life of Lines’: ‘The power of the imagination lies not in mental representation nor in a capacity to construct images in advance of their material enactment, rather imagining is a movement of opening not of foreclosure and what it brings forth are not endings but beginnings’. In this way, new ideas and words are brought into the workshop context, and these words are now available for both participants and facilitator to address and speak about the original concern. This constitutes an important outcome of the process.

**Documentation**

At this point, the workshop has officially finished, and the mood changes and becomes more informal. Casual conversations are had across the room about the overall project aim, and the facilitator is available to answer questions and provide additional context, if needed. This is deliber-ately done in an casual manner, allowing participants, who feel the need for further conversation, to linger and process the experience. In some cases, follow-up interviews are made at this point, but it is often not practical to engage participants in lengthy debriefing sessions after an event.

During this final phase of the workshop, participants are invited to pose for a photo with their model, one by one. Each photo is self-staged, with the participant deciding how to best illustrate their thing and finally approving each shot. Documentation is an ongoing challenge in these workshops, it is important to find non-intrusive ways to document and
capture the often very fragile moments and insights. The main requirement here is that the making of data cannot be allowed to break the flow of the workshop experience itself. For this reason, we limit the amount of documentation during the actual workshop phrase.

By inviting the participants to essentially self-document their prototypes at the end of the workshop, we achieve a number of objectives:

- The participants are able to opt out of this phase entirely.
- By controlling the framing and style of the photographs, they can decide if they want their faces in the photograph or just their hands.
- The artistic qualities of these images add value to the documentation.
- The fact that the participants can control the form and aesthetics of the photos, underlines their role as co-creators rather than observed users.
- By creating less, but more important photographic documentation, we free ourselves from the temptation to conduct a full anthropological analysis of the workshop, which would be in conflict with the stance of users as collaborators rather than subjects under investigation.

Fig.21. Self-posed images with machines (RBMA 2015 Paris).
Variation versus Structure

\[ (-.-.-.-.) | (\ldots) \]

Fig.22. Visualisation of the basic workshop structure, with the core workshop session consisting of a number of discrete steps \(-.-.-.\) and enclosed by a clear beginning and an end. The second bracket is the documentation process.

As mentioned above, the details of the workshop experiences vary from event to event, as experience is gathered over time, but also as a result of being tailored to the subject and context at hand, participant profiles and the organisational structure around the event itself. Put simply, different projects call for different variations of the workshop experience, but most of the steps described above are adhered to. To encapsulate: The time frame is short, and the pace is high; the experience opens with an intro and a prompt, and closes with a presentation and discussion; and documentation is conducted in a separate experience at the end.

<table>
<thead>
<tr>
<th></th>
<th>OWL</th>
<th>Anti-Solution</th>
<th>JEGG Candy</th>
<th>JEGG box</th>
<th>ADE 2015/16</th>
<th>Cello</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prompt</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(body)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Making</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(city)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(play)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Discuss</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Fig.23. Different projects making use of different selections of elements.

The diagram above shows, how the different project make use of the various steps of the process. The two outliers here are the Anti-solutionist workshop (Blythe et al. 2016) and the Cello project (Andersen and Gibson 2017). These project were unusual in that they either had a more complex set of priors to handle (turning the researchers into stakeholders, contextualising to the city), or were conducted in an iterative manner with only two people (including the facilitator).
9. Physical Outcomes

The prototype objects themselves constitute one of the outcomes of the work described here, and they constitute the second category of proof, as defined in chapter 7. While the fact that any object is built is an outcome in itself, the built objects themselves can be divided into more or less successful forms. As discussed above, the workshop format has changed over time, driven by a desire to improve the quality of the material outcomes.

This can be done is through changing the availability of materials. Certain materials appear to shape and influence the outcomes strongly, whilst others encourage an additive approach rather than new forms etc.

To be specific, the following critique of the material outcomes does, in no way, serve to critique the ideas and efforts of the participants. It is, however, an explicit way to evaluate the workshop design and material selection.

In the following, I will discuss examples of material outcomes from a number of different project contexts: Amsterdam Dance Event 2015 / 2016 and Je Eigen Gang Gaan (The Modular School) 2016.

The examples form four thematic pairs:

- Scope of idea: Complexity vs. Simplicity
- Level of execution: Precision vs. Vagueness
- Ability to communicate: Evocation vs. Preconception
- Responses to available material: Resilience vs. Limitation

These categories are the ones that fit into my personal understanding as facilitator - other facilitators might be looking for other outcomes, and any categorisation is clearly flavoured by the position and stance of the interpreter.

However, these are an attempt to identify features that are generally opening rather than closing, novel rather than known, detailed and evocative rather than vague and obvious.
Project context: GiantSteps/ADE 2016. In 2016, I was invited to conduct the ‘Hypothetical Instruments’ workshop at ADE (Amsterdam Dance Event) in Amsterdam. We worked with 8 participants and the materials were: paper plates, paper and plastic cups, plastic cutlery, string and cardboard. This workshop formed part of the GiantSteps project.

The prototype shown in Fig.24. is described by the participant as both a physical representation of a conceptual sound, and a design suggestion for a modular synth that rotates during playing. As such, the prototype indicates both a way for the interface to be played, and a metaphor for how, it is working through so-called granular synthesis\(^43\). These two aspects of the model are integrated into its form and with each other. The outcome is a surprisingly mature design proposal, which holds potential for multiple levels of interpretations.

This is the first example of a successful outcome type: **Complexity**. This type is generally characterised by representing a complex idea, expressed in a manner that allows plenty of creative head-room. As a result, the object is more than the sum of its parts. It is an example of both an embodied thought and an abstraction that illustrates that thought.

---

\(^43\) Granular Synthesis is a method by which sounds are broken into grains which are then reorganised to form other sounds. [http://www.soundonsound.com/techniques/granular-synthesis](http://www.soundonsound.com/techniques/granular-synthesis), accessed on 7th of June 2017.
The object moves and changes as an explicit physical idea, but at the same time, it might be seen as a schematic representation of something immaterial, like piece of software, or a composition. I consider this a successful outcome, as the object functions as an effective site for a conversation of the subject it addresses.

Simplicity

Fig.25. Self-posed documentation image (ADE 2016).

Project context: GiantSteps/ADE 2016. See description above. The prototype, shown in Fig.25, is an instrument idea that hinges strongly on the classic idea of the tin-can telephone. Two cups are connected with wire in the traditional fashion, and a number of objects are hung on the wire between the two cups. As the objects on the wire are manipulated, the two listeners (at either end of the string) can hear the result. The prototype does not substantially change the original idea and in fact, it is a direct manifestation of a traditional Danish folk expression ‘en kurre på tråden’ (roughly translated to ‘a knot on the line’ and similar in meaning to ‘getting your wires crossed’). It illustrates a phenomena, but does not provide much scope for elaboration. In the discussion, it is hard to elevate the idea to a more complex and novel one. In fact, this is not really a explorative model, but rather a working acoustic instrument and as such the workshop materials, instead of providing a clear, creative obstruction are in fact just providing substandard acoustic possibilities. The function of the object has formed a barrier here for any further exploration. It forms a closed creative process, and the next logical step would be to discuss the final execution of it in terms of materials, execution, use etc.
This is the first example of a less successful outcome type: **Simplicity**. Closed prototypes come in various forms, some are literal illustrations of a problem or an idea; some are working objects like the acoustic example above; some are simple combinations of two well-known functionalities; or the addition of an invisible *smart* ability to a well-known object. What is common for them all, is that they are conceptually closed, and do not work well as starting points for conversations. They present, as finished objects that does exactly, what it says *on the box*, which we must simply take or leave. The physical execution of the object is essentially ready-made, and as a result, it relies entirely on the verbal description, and the object itself provides little additional knowledge.

![Precision](image)

**Fig.26. Self-posed documentation image (ADE 2015)**

Project context: GiantSteps/ADE 2015. This workshop was conducted at Amsterdam Dance Event 2015 with the same setup and structure, as the one the year after at ADE 2016.

The prototype, shown in Fig.26, is an interface for the real-time manipulation of musical events. The execution line, where musical events are effectuated, runs along the axis of the paper cups, and the zig zag lines illustrates the music, as it is heard. Below are the musical events that have not occurred yet, arranged in a manner known from professional digital audio workstations\(^44\).

The goal of the interface is to be able to control the timing of a musical event (such as a beat), while the music is playing. A particular beat or melody line can be nudged forward or held back in response to a live performative experience. By manipulating the cups, all approaching musical events can have their timings modified on a micro level.

This is an example of a successful outcome type: **Precision**. Here, we see a highly complex idea (micro-timing of musical events), expressed in a straightforward and simple manner. The idea of micro-timing of discrete musical events in real-time is at the edge of what we can imagine, yet the object itself explains the idea well and adds to our ability to enter into a detailed discussion of it, before it is anywhere close to being built.

The simple materials are used effectively to create a complex, but united shape, which conveys a precise design statement. This is an example of an idea that is fully formed and detailed, but is so complex and interesting, that it retains its ability to form the basis for a broader conversation.

**Vagueness**

Project context: GiantSteps/ADE 2015. See description above.

The prototype, shown in Fig.27, is another sound control interface. The central shape represents the mixed piece of music, made up of a number of individual channels (or strings) that can be manipulated to influence the final mix of the piece. This prototype effectively suggests a very sim-
ilar interface to the previous one, but the change it suggests, is vaguely defined and the function is unclear. Each string allows a musical channel to be changed, but the model does not provide us with many clues as to, how this will happen.

This is an example of the less successful outcome type: **Vagueness.** The model does not seem to question or elaborate on the issue at hand, instead it appears as a collection of materials that have yet to gel into anything recognisable as a new form. The idea hints at an underlying concern, but the model itself does not represent a strong enough design statement to facilitate bringing it to light. The fact, that the object is symmetrical and the same from every angle, adds to this loose quality. As a result, when addressing the idea, both the maker and the facilitator find themselves at a loss.

**Evocation**

![Candy model](image)

*Fig.28. Candy model (Je Eigen Gang Gaan / The Modular School 2016).*

Project context: JEGG 2016 / Candy. Between 2014 and 2016, a number of workshops were conducted for the project, Je Eigen Gang Gaan (The Modular School), which aimed to investigate how creative practices can contribute to vocational education. Together with the architect, Skafte Aymo-Boot, we conducted a string of workshops in order to generate architectural material for the creation of spatial interventions between the scale of furniture and buildings. To facilitate this, we used scale-models of humans and materials such as candy, matchboxes and cardboard, which
in turn encouraged specific creative strategies: subtraction, deconstruction and construction. In this example, we are making spatial objects in the scale 1:100 using only candy as material.

This small candy model (Fig.28.) is a place of safety for the 1:100 girl figure. It provides her with a place to retreat to during school, to concentrate and work, but perhaps more importantly to regroup and hide from the social pressures of the student group. The space is inviting and small, with just enough room for one. The semi-transparent material allows her to stay connected with the life of the school, whilst taking a break from things and chill out. One aspect of this space, is that it allows the girl to skip a class without leaving school, making it more likely that she will rejoin later in the day.

This is an example of a successful outcome type: **Evocation**. The model is simple and the shape is deeply influenced by the candy material, but has managed to transcend some of the iconography of the candy. The model is scale-appropriate and the placement of the model girl functions to evoke a complex narrative around safety and care. In a way that is characteristic for outcomes of this type, the model manages to tell us a story that brings the whole group along and facilitates a complex and respectful conversation.

![Fig.29. Candy model (Je Eigen Gang Gaan / The Modular School 2016).](image-url)
Preconception

Project context: JEGG 2016 / Candy. See description above. This model (Fig.29.) is addressing a similar concern to the previous example (Fig.28.), but here the model is less effective in two ways: the figure seems squeezed and uncomfortable in the space, and the model itself simply looks like a stack of the available materials.

This model is an example of one of the less successful outcome types, **Preconception.** Here it is clear that the material choice has dictated the outcome, the workshop facilitator has failed to inspire a more engaged outcome, or the participant has for some reason not engaged with the task. The idea at the base of the model is no less interesting and complex, but the model itself stays a collection of separate objects, locked within their own form and identities. For this reason, the conversation around the object might still be productive, but the model itself is not participating in or contributing to this.

Resilience

Project context: JEGG 2016 / Matchbox. In this example, we are making spatial objects in the scale 1:50 using only empty matchboxes as material. This workshop session was conducted immediately after the candy one, with the same group.

This model is a small piece of furniture designed to provide occasional seating; a plinth for presentation; or even a vantage point for standing on, to present, or just to get an overview of a room (Fig.30). It is designed as an open bookshelf, allowing objects, books and lunch boxes to be stowed, and it is on wheels to facilitate mobility in response to the changing needs of the room. It is a highly flexible object, created from the matchbox material, but not beholden to the matchbox for its structure or form.

This is an example of a successful outcome type: **Resilience.** Objects in this category have a strong identity as ideas and as designs, that becomes apparent and distinct despite the challenges of the available materials. The exercise of pushing it through a difficult material appear to allow the form to be clarified in the process. The idea is expressed without relying on the given inertia of the material, but with an understanding of what the matchbox can be made to do.
Fig. 30. Matchbox model (Je Eigen Gang Gaan / The Modular School 2016).

Fig. 31. Matchbox model (Je Eigen Gang Gaan / The Modular School 2016).
Limitation

Project context: JEGG 2016 / Matchbox. See description above. This object (Fig.31.) acts as a simple space divider, to be placed in a larger room, creating three smaller spaces in which to gather and work. The desire to do so, is a reflection of the work methods of the school, which are moving towards group collaborations and project-oriented work. Again, the idea is productive in itself, but the object does not add to the narrative in a way that evokes further exploration.

As a form, the three cupboards are placed at even distances from each other, and maintain a design that is largely derived from the existing form of three matchboxes. This is an example of a less successful outcome type: Limitation. The model does not rise above the material it is made from, and in fact it is possible that the material limitation has hindered the development of the idea.

Material Outcomes

When making evaluations as explicit, as I have above, it becomes clear that the physical outcomes of the workshops have value on a number of different planes. Some objects are valuable in terms of the form-critique detailed above; the designs are fluid and balanced; and the idea is clearly present in the execution of the model. Others serve as evocative inspirations for conversations within the group, allowing others to see possibilities and potential, in what can sometimes be a very simple construction. Others serve as simple vessels for notions and ideas, which are somewhat or completely beyond, what is represented in the model.

The critique of the designs here, is solely used to evaluate the form and execution of the workshop; the choice of materials; and, the timing and flow of the experiences.

The true purpose of the making process lies in facilitating an extended period of embodied nonverbal thinking and the intense presentation/conversation at the end. The skill and execution of the model making is only important insofar as it reassures and facilitates the making/thinking process. The true value of these objects lie in the fact that they are built as temporarily vessels for ideas.
An example of this process can be found in the feedback from a recent workshop at the sIREN conference in Edinburgh. A participant writes:

In building my model, I was surprised how important the materials were for me. I can’t explain how/why I gravitated to certain materials and not others, but once I had selected things to work with, their implicit potential directed my construction. A tension immediately arose in trying to reflect the sound image of my drawing through these materials, which took on a certain life of their own. My drawing pulled in one direction, while the materials pushed back. Toward the end of the process, I tried adding a few further components, to connect the object more specifically to what I had drawn, but these details (the rubber band, for example, and the straw blowpipe, which I removed) seemed dispensable once the object was finished.

Participant C, Edinburgh 2017

The model (as shown in Fig.32.) comes across as strangely complete. It sits as a balanced proposition. The four main elements are connected fluidly and the result is dynamic, powerful and at rest. As such, it is both complex and precise, and at the workshop brought about a long, engaged discussion. The participant goes on to say: ‘I honestly didn’t understand my object at all until you and others started commenting on it. I had thought of it as a non-sounding instrument, that reflected the internal hearing of a musician, when studying a composed musical score, but other people did see it as having acoustical properties.’
10. Inside the Workshop Experience

In order to capture the workshop experience from the inside and provide a different set of evidence, I conducted interviews with three participants from the same workshop (the initial session from the ‘Anti-Solutionist’ paper, included as one of the associated papers to this text). The interviews were conducted at the conference, ‘Research through Design’ (RtD 2017) or over Skype and each session, following Rapport’s description, can be seen as ‘a nonroutine conversation, with a purpose or design which at least one of the talking-partners has previously determined, and which need not be repeated’ (2012). The similarities to the workshop situation itself cannot be ignored, especially as Rapport goes on to describe the significant elements of the interview as: ‘the nonroutine, a purposiveness and a boundedness. The interview is, as an ideal type, a thing-of-itself, a mini-relationship, a micro-institution.’

In the following, I will continue to follow Rapport’s insights, as they relate to how we might make sense of not just these conversations, but the experience they recall. I have processed the interviews by sorting them into loosely defined stages: contextualisation, secrecy, adjustment, emergence, exposure, friction, cohesion and rationalisation, while adhering to a chronological structure in such a way, that the workshop unfolds through the quotes. As the facilitator of the session, my own recollection is part of determining this order, and as the narrative proceeds, I have labeled the material to chronicle the development from curiosity, collaboration, conflict and doubt, to insight, empathy, and closure.

Every workshop is located within its own context and circumstance, and in this particular case, the participants were researchers and academics, working on a project addressing city-scale interventions with a particular focus on the elderly. Since the workshop was done with young professionals in an inside space, I needed to add a number of additional steps to anchor their contributions into a personal (non-professional), emotional context, as well as to address the city as a site for intervention.

In order to achieve this, I asked each participant to write down their personal fear or hope for what kind of older person, they would one day be.

These cards were not shared, but instead sealed and put away in a pocket. They were then told, that the person described on the card, was the person they were designing for during this workshop session. The other additional step was to include a demo moment between making and discussion, when each participant was asked to go outside with their prototype and ‘try it out’. This was done to anchor the final conversation in the cityscape, outside the university buildings.

**Contextualisation**

_The first thing I remember doing is you setting up that kind of exercise where we imagine our future self, and write it down. [...] I put down lonely and bitter, angry old man._

*Participant M*

By asking these researchers to imagine themselves as older citizens, a vulnerability is introduced which triggers both their hopes and fears. The participants’ task is now to empathise, not in a professional manner with their project stakeholders, but by connecting the work with themselves, and their own personal concerns for their future.

**Secrecy**

_Then you said just put that in your pocket, and forget it._

*Participant M*

The future-self vision is not shared. The participants are asked to seal it into an envelope and put it away in a pocket somewhere. This way, it will function as a transgressive secret, similar to the hiding of the money in Blast Theory’s ‘A Machine to See With’, where the participant is asked to hide money on their body as an initial act of commitment\(^46\). Additionally, as everyone does this, every participant knows there is a secret kept on the body of each person, whilst not knowing the exact content. This introduces a layer of complexity to the group’s interaction with each other, encouraging them to view each participant as emotional beings rather than colleagues in a research setting.

*I like that feeling of having a secret, that the rest of the group doesn’t know.*

*Participant C*

---

\(^46\) [http://www.blasttheory.co.uk/projects/a-machine-to-see-with/](http://www.blasttheory.co.uk/projects/a-machine-to-see-with/), accessed 7th of June 2017
This initial establishment of a secret is conceptually similar to the drawing of the sound in the previously described version of the workshop. It functions as a seeding of the context, in which the rest of the experience is going to be conducted. By doing this, the participants both show commitment to the experience and create the contextual backdrop against which, they will be acting for the duration of the workshop. They are in a sense now in character. An important aspect of this, is that they are not asked to share the information on the card (again, in the same way that we do not ask the musicians to explain their music).

*I didn’t have to tell people what that was, which I would have found deeply uncomfortable, because it’s actually quite a personal question.*

Participant C

*You’re always a bit nervous that you’re going to have to share it, aren’t you? Sort of go around the room in a tedious way, and find out what everybody else put, and then you didn’t do that, so that was kind of great.*

Participant M

The keeping of the secret, can be seen here as part of the social contract that is developing within the group and in relation to the facilitator. This establishes the future vision as a secret, but is also an initial demonstration of trust and respect: I will not expose you, and I will respect your privacy.

**Adjustment**

At this point, the participants are asked to build a machine for the person, they would be in the future. As usual, a limited set of materials is available, and in this case (probably because this was a group of professional researchers), this creates some conflicts:

*Then we had the cardboard, which I loved. The thing I really struggled with, which I think I slightly veered away from what you asked us to do, because... I was responding to the materiality of it. That’s how I ended up pulling all those strips, which then started to look like kindling to me.*

Participant C

When faced with the material challenge, C first has to divest from the impulse to please the facilitator. The material itself seems to do that, since there is an obvious way for her to address the cardboard. At this moment and in this interaction, my aim is to discourage my perceived role as design authority.
You said just sort of make a machine of some kind. Then it was going and getting materials and starting. I remember you told me off, which was also interesting, because you know I wanted a pen. I wanted to do the classic thing, which was draw buttons. You said, “No, no pens allowed.” I was asking, and you’re like, “yeah, you want to draw buttons, but you can’t.”

Participant M

Here, M is demanding a return to how-we-do-things, and is looking for a pen. In this situation, my role is different, I initially refuse the request in order to assert my authority over the framing of the experience, and then later I relent:

I think actually, I think you might have actually given me a pen, and I think I used it to make a dial or something like that.

Participant M

Trying to avoid pens and button-like materials is based on a desire to avoid that the technology part of the prototype is mimed by adding a technology signifier. However, when challenged, I will bend and allow the pen, as in this case. I do this to avoid that the lack of a material becomes a focus of the work, and instead, by allowing it, the participant can move on from the position of protest.

This is also the moment, where a participant might think that they are doing it wrong. We are generally conditioned to want to please those who present us with tasks. We want to do well, and solve the challenges in a manner that will be rewarded. Typically, the participants are reassured by seeing everyone else work, and the fact that they are working under time pressure, with a limited set of materials, also helps to reassure. The task is made deliberately difficult, and this effectively means that the participant does not carry the full responsibility for the outcome.

Emergence

Through the actual making, a number of distinct models now emerge.

And then it became a handbag, because I was thinking about old ladies and their handbags, like how important my grandmother’s handbag was to her. That’s a bit of a kind of old woman cliché, but I like the idea that inside there is this kind of destructive kind of counterintuitive idea that like yeah, you could start to burn stuff down.

Participant C
I was doing like this poo detector thing because you know I was an angry and bitter old man. It just kind of connected with some things that have been happening around my neighbourhood...

Participant M

I made a thing called the Listen-in-ator... This imaginary device that would just listen in, magically. All these snippets of information that was quite random.

Participant R

At this moment, the making can be seen to gel into objects and ideas with distinct descriptions. This is partly driven by the time pressure, at this point the time is simply up, and the prototype must find its identity, as the workshop experience moves onto the next stage.

Exposure

In the case of this particular workshop, there is an additional layer of estrangement: Take the thing you built outside, and try using it in the city.

I can’t remember exactly when you introduced this idea, whether you said it at the start or whether you just kind of sprang it on us, but at some point you said, “Okay, now you’re going to go out into the city and demo it”.

Participant M

The confrontation with the real world forms an abrupt break from the closed circle of making. This step is not always required, but was added in this case to make sure that the session was somehow anchored in the city as a site, and as a central frame of reference.

Anyway, me and M, I don’t know how this happened, we ended up going out together. M had a DNA poo detector. I had this Listen-in-ator.

Participant R

That was kind of quite, you know embarrassing, I guess because it’s all very well, isn’t it being inside one of the rooms in a university and being silly with your cardboard or what have you, but then to kind of go into the city and muck around with it... I was with R, and R was completely up for it and just having fun I think.

Participant M
Here, we see two of the participants describing the experience of bringing these objects into public space. There is a new emergent collaborative aspect, necessitated by the desire to take pictures, and in effect, the participants supporting each other, constitutes the *trying out* of the prototypes.

*We decided to go across the road, to the Civic Center, which is where the councils are. M was walking around, and I was photographing him with his DNA poo-detector. He was really acting it out. Being an older person, going round the park.*

*Participant R*

*I was trying to kind of get like a picture of some poo being detected, but could not find any poo. That was a bit of a disappointment. R had made this thing, a listening device. Then she sat it up outside the council, and the council were one of the partners on the project.*

*Participant M*

*We took my device, which was literally a cardboard box with a bit of wool and a piece of paper, and took it into the confines of the council. It’s not in the council building itself, but going into the main entrance.*

*Participant R*

The two participants have now formed a team, trying to find the best opportunity to rehearse, how the object might work. The shared experience of secrecy is brought into a much starker perspective, in addition to the initial secret, the two participants are now engaging in a performative act in a public space.

**Friction**

By collaborating, M and R are now partaking in an impromptu theatrical improvisation, allowing the following situation to take place:

*I laid it out and M was asking me questions about how it was working. Then I heard somebody say, “R, is that you?” It was one of our partners for the projects, who had only obviously ever met me in situations where I was quite serious, having meetings. At that moment I had to decide that I had to follow through on what I was talking about. I maintained the imaginary that I had created, that this was an actual technical device that we were developing, and that it could listen in to all the conversations at the council. He looked very confused, and asked me a few more questions, and then scurried off upstairs, wherever. Then there*
were a series of other council workers that I knew, coming down the stairs. Kind of laughing at us, with this cardboard box out in the council, just outside their reception.

Participant R

Then this beautiful moment happened, so you know R was posing with this crazy cardboard contraption that she’d made and she had this like listening thing part of it going on, and one of the project partners walked by, and was like, “Hello, what are you doing?” She said, “I’ll tell you, we’re making a listening device to listen in on council meetings.” He kind of went like, “Oh, ha, ha, ha”, kind of thing, and then carried about his business. It was perfect really because it was kind of like “oh my god what are you people doing, and what is taxpayers money being spent on”, but it was also kind of this connection of one of the things of the project, which was communication between the council and the people.

Participant M

In this moment, the cardboard prototype meets its intended environment in an unscripted and unmediated situation. The experience changes from a lighthearted experiment to a serious moment of improvisation. By insisting on the seriousness of the proposal, the participants are finding themselves both challenging and being challenged by the structural power situation, they were originally trying to address. As such the experience can also be seen as a body storm or even a rehearsal of a critical design proposal.

I think that whole accidental interaction helped articulate, what it was that this device was trying to do. Before that it was all working with all these little bits. I don’t know why I decided, I felt like I needed to commit to it, and just see it through, just to see the reaction rather than going, “Oh, it’s just a bit of fun. We’re just playing,” or whatever. M had committed to what he was doing, it was like, this is what I need to do. I actually think, it was good for the council to see the kind of things that we were doing as well. It wasn’t just sitting in meetings and talking to people.

Participant R

This confrontation allows the model to come into its own as a design proposal; when faced with the skeptical observer, R decides to double down and commit to the concept of the model, and it can be argued that it is in this moment that the prototype finds its identity.
Cohesion

When all participants have returned to the workshop space at the university, the participants take turns presenting their models to the group.

Then we presented it back, didn’t we. I think it was a very enriching experience, because there was a conceptually rich structure behind it, and drawing together those more psychological constructs. Where you didn’t feel obliged to commit to those. You can build something that was, that you could imagine yourself into. Then just not having to worry, at first feeling, “Oh, I’ve got to make something,” then not really like it needed to be anything. The rougher it was in a way, the more story telling I would have to do around it to make it real.

Participant R

So then we came back and we sort of demoed it, we would talk about our machines. I remember being slightly nervous about this actually because you know, there were a lot of people that weren’t used to doing that kind of thing.

Participant M

As each participant describes and demo’s their cardboard machine, the situation takes the form of a design school presentation, where both participants and myself, as the facilitator, takes turns to ask questions and prod at each proposal in order to arrive at the strongest and most interesting concept. In this version of the workshop, this part of the session was recorded on video.

I thought, what was really interesting about it, was the kind of question and answer, and having to kind of perform for the video camera, for that setup. Yeah, I remember you having this very amused, but serious conversation with each person. Taking each of the ideas very seriously, and acting as if the ideas were very developed, even though sometimes clearly they weren’t. Asking follow up questions, like “oh really, and how does this aspect of it work”, and then the person who you’re asking has no clue. I didn’t have any clue anyway, but you know we’d kind of think of some answer because you’re on camera, you want to look as if you’ve got some answer I guess.

Participant M

Through the ensuing conversation and with the added pressure of being on camera, each project clarifies further, as its maker is forced to quickly arrive at a series of explanations for what it is, and how it works.
I remember C did a nice thing about an exploding handbag. I can’t remember much about it, apart from it was kind of a DIY exploding handbag. I can’t remember what her rationale for it was, but she made a nice little cardboard model of it anyway.

Participant M

You have this moment where it suddenly coheres. Afterwards, it seems incredibly obvious, like this process and you come up with this, and it’s kind of a little bit disappointing, when you explain to it. The magic of experiencing it, when you just suddenly go, “Oh, hang on. Right. It’s a handbag for arsonists.” That feels like such a big breakthrough, and that feels like suddenly, all these pieces that you’ve been trying to make work suddenly ... For me, at least, it feels like, oh. It goes from being a collection of stuff to a thing.

Participant C

This moment of cohesion constitutes an important outcome of the process. The tight set of challenges and the time pressure all leads up to this moment, where a whole set of half-articulated concerns suddenly are forced into a strong concept. It is also worth noting that more than half of the participants choose to reveal their visions of their older selves at this point. The secret has served its purpose, and it is no longer required to be kept hidden.

Rationalisation

In each of the interviews, the participants offered some level of evaluation or rationalisation for their personal experience of the workshop.

I don’t think it came into being until we were there at the council offices, in a way. That was a really important part of it. Giving it agency within that space. I was obviously drawing from a lot of research, where older people were talking to me about, “Oh, it would be great to know what the council are up to.” I was drawing on that, not in the front of my mind, but taking it over to the County Council officers, and acting it out.

Participant R

It wasn’t fully articulated, until that point I don’t think. Especially when I was confronted by somebody. That triggered something where I had to articulate it further, and make it into something that kind of sounded like it could be something.

Participant R
It was quite a mixed experience for me, well, the overall kind of part of it. I finally have realised since then that I am not a good workshop participant, because I get really moody when I'm making stuff, and then having to make stuff in a social setting is quite difficult, especially with people I don't know terribly well. Yeah. I was having to deal with that a little bit.

Participant C

I remember it being really funny. I remember it being like a laugh, and fun mainly. Not the kind of workshop, the kind of workshop that I find really frustrating and really boring is the kind where you're writing on post-it notes, and you know you end up with a wall full of post-it notes with words like “identity” on them. That’s really boring, I think, and ritualistic. This didn’t, I mean it some ways it did feel sort of ritualised, it felt like a kind of, almost like a different kind of space, in a different kind of time, and a different sort of way of being.

Participant M

It is interesting to see, how different the three experiences are described, and this highlights an important aspect of the workshop: These are not collaborations, and the outcomes remain personal and individual, instead the participants are lead through a communal experience of individual exploration. The outcomes are not democratic in the sense that they are ruled by consensus and negotiation, instead, they are driven by a temporary convergent experience that allows each participant to follow along in their own manner, and in response to a highly personal set of drivers. This desire to leave room for diversity and difference is an example of a link back to the methodological origin in the performing arts.
11. Application and Deployment

As the final set of material, defined in chapter 7, I provide an overview of the different contexts where the Magic Machine technique has been used, by myself and other researchers. I include this, to show some of the ways the technique can be used, in education, the arts and technology development.

Over the years, I have conducted the workshops at organisations such as Das Theatre (Academy of Theatre and Dance, Amsterdam University of the Arts), Piet Zwart Institute (Rotterdam), Utrecht School of the Arts, Willem de Kooning Academy (Rotterdam), Royal Conservatory of The Hague, Edinburgh University, Museum of Modern Art Istanbul and STEIM (STudio for Electro Instrumental Music, Amsterdam), and at events such as Amsterdam Dance Event, Red Bull Music Academy, CHI (Conference for Computer Human Interaction), Transmediale (Berlin), ISEA (Inter-Society for the Electronic Arts), PD (Conference for Participatory Design). A number of these events are described in the associated papers, but three examples stand out: ‘Anti-Solutionist Strategies: Seriously Silly Design Fiction’ is an example of making use of the technique as a distinct event within an existing research project\(^{47}\), ‘The Dial’ is an example of the technique forming a core methodological aspect of a large technology development project, GiantSteps\(^{48}\) and finally, ‘The Instrument as the Source of New in New Music’ shows the technique being used in a process of developing a piece of artistic technology\(^{49}\). The first example has already been discussed in detail, while the other two are described below.

The GiantSteps project is an example of the deployment of the Magic Machines workshops within a close-to-market Research and Innovation Action research project. The project was a three year collaboration between music research institutions (Universitat Pompeu Fabra, Johannes Kepler Universität), manufacturers of software and hardware for music production and performance and R&D companies (Native Instruments, Reactable, JCP-Connect), and music practitioners (STEIM, Red Bull Music Academy)

\(^{47}\) https://openlab.ncl.ac.uk/projects/myplace/, accessed 7th of June 2017
\(^{48}\) http://www.giantsteps-project.eu/#/, accessed 7th of June 2017
\(^{49}\) http://steim.org/learn/masters-program/, accessed 7th of June 2017
supported by the European Union 7th Framework Programme. The project ran from October 2013 to October 2016. During this time workshops were conducted on location at STEIM and Native Instruments, at events such as Amsterdam Dance Event (ADE) and the annual Red Bull Music Academy events (RBMA).

In the project, my role was to drive a highly user-centred cross-consortium research process, using my workshop techniques to help gain a better understanding of how musicians ‘see’ their music; how this information can be conceptualised; and how that could inform the consortium’s approach to Music Information Retrieval and interfaces for creative musical expression. This was done through executing Magic Machine workshops with expert music makers, paired with peer-interviews (Andersen and Grote 2015) and enactment of speculative future scenarios, as described in the paper ‘The Dial: Exploring Computational Strangeness’.

In contrast, the Modified Cello, as featured in the paper ‘The Instrument as the Source of New in New Music’, is a collaboration with a musician, Dan Gibson, supported by STEIM (Studio for Electro Instrumental Music). The origin of the collaboration was the musician’s desire to rebuild and re-imagine a cello as the site for the generation of musical sound, as well as for the complex modification and processing of that sound through software. The underlying concern was not simply to improve on an existing instrument or to make it suitable for electronic music, but to create structures that might fit better with the artist’s personal mental images of the music. As such, the work was focussed on improving flow, intuitive modes of expression, and unbroken periods of concentration in the experience of playing music. My role here was to conduct, what essentially amounted to, a longer on-going workshop for one, aimed at making conceptual models and placing physical manifestations of musical aspects on the body of the instrument in, what became, an iterative process of allowing a new hybrid instrument to take form.

As the Magic Machine Workshop technique has matured a number of colleagues have started using it in their own local context, such as Amsterdam University of Applied Sciences, Waag Society (Amsterdam), Institute of Imagination (London), and Northumbria University (Newcastle). In the following, I will relay some quotes from my interviews with these workshop facilitators, illustrating their experiences of using the technique.
Fig.33. Making a Magic Machine at RBMA Paris 2015 (GiantSteps).

Fig.34. Making a Magic Machine at RBMA Paris 2015 (GiantSteps).
with students, professionals, and finally as a part of a personal art practice. Each of these versions of the workshops expand and modify on mine, illustrating the central position of the facilitator, both as the focal point of the experience, but also as the creator and conductor of each Magic Machine workshop. The original technique provides framework and structure, but the results are entirely filled with the concerns and context of each facilitator, something I will return to in the next chapter.

Mark Blythe\(^{50}\), from Northumbria University, has been doing the Magic Machine workshops with his students for a number of years. He uses the technique to initiate the work on new student assignments:

> So I just kind of tried to do what you did really, and just take it all super seriously, you know in a light way. Just kind of get them to think more about how it might work, or when it might be.

The purpose here, is not to necessarily provide specific starting points to these student projects, but rather to get them started and introduced to the design process in a playful and productive manner:

> I've been doing it for the last three or four years I guess. [...] I think partly it works because if you’re going to be creative then you need to be in a state of play. You need to be relaxed, and you need to kind of like not be taking yourself uber seriously anyway. So I think the materials and all that, matters in that respect, but I also think that it matters in terms of, you know, when they think they've got a good idea, not being precious about it.

In the hands of this facilitator, the Magic Machines are foremost a technique to lower the initial stakes of creative work, the materials and time-pressure forming obstructions to help dislodge the creative blocks of a new project.

Karien Vermeulen, from the Waag in Amsterdam, makes use of the Magic Machine workshops to kick off their ‘maker camps’ with teachers and educational professionals\(^{51}\).

\(^{50}\) For more information on Mark’s work see: http://markyblythe.wixsite.com/researchfiction, accessed 7th of June 2017

TEACHER MAKER CAMP

10 RECIPES TO HELP TEACHERS (RE)DISCOVER THEIR INNER-INVENTOR & GET SKILLED IN MAKER EDUCATION

A PUBLICATION BY WAAG SOCIETY

Fig.35. Teacher Maker Camp.
The maker camps are intensive 2-3 day workshops, where school teachers are introduced to digital interaction and skills like laser cutting and 3D printing in a fabrication context. The aim here, is to provide them with an impetus to include making into their curriculum back at their own schools.

We use it to get them into making very quickly. So also the idea that it is about experimenting, this is about learning new things, it is about doing things that you’re a little bit insecure about but it’s doesn’t matter, you just dive in there and go and I think that the workshop really helps them to start working with their hands, getting out of their heads really quickly.

The maker camps are short and intense, it is crucial to get the participants to build things immediately. Since they are all teaching professionals, who might have trouble entering into a learning role, the Magic Machine workshop must be made very playful and easy to enter. This is then the underlying additional goal of the technique in this context, forcing the teacher into the experience of exploring and experimenting.

So there are constraints, they’re like hooks, that you can tap into and of course one of the things is the fact that you use the list of, what is it, motivations, desires. [...] You have to pick one really quickly and then you have to do something for it. So I think that constraint, but also it’s a mixer, if you open up ideas because you give them those basic desires and they’re a little bit scared to make it, they’re a little bit strange or a little bit funny.

As a result, the participants can present something to the group within hours of arrival at the Waag, and these fast prototypes often goes on to form part of their work over the span of the camp.

But by limiting it, actually the unity and aesthetics becomes really easy for people. [...] You limit something, but actually the engagement and the fact that they are forced to pick something, that is urgent.

Cally Gatehouse\textsuperscript{52} has been using some of the underlying strategies from the Magic Machines workshop in her own work. In this case, she has taken part of the ethos and framework, but re-imagined it to fit into a personal work process.

\textsuperscript{52} For more information on Cally’s work, see: http://callygraphy.co.uk/
I had this idea about making these digital screens to go in public spaces that were like the antithesis of the commercial advertising screens. [...] Then after the workshop [...] I was like, “Alright, fuck it. I’m just going to make it out of cardboard and these odd things and go and put it up and then photograph it. [...] I almost exactly copied your method, but just did it by myself.

In this example, she describes how she made use of the technique as an artistic strategy:

_I did one in cardboard and put it up in the underpass near work, which I walk through to and from work. In day, it’s okay, but at night, it’s really not a pleasant place to walk. It has a little eight by eight pixel screen, just eight by eight big pixels of the scrolling display... I wrote on it, “Sometimes I don’t feel very safe here.”_

This first prototype immediately created friction as it was confronted with the reality of the underpass:

_After that, this homeless guy started sleeping under there, and he started making these little shelters out of cardboard. The thing I’d made actually looks like a little birdhouse. It took on this whole new meaning afterwards. [...] At first I was just horrified, and it was like, “Oh, I should never speak of this again.” Then I was like I think this is an important story._
She continued experimenting with this kind of rapid execution and placing objects in public space:

*I thought, right. I’ll make one about being drunk in public. I bought a White Lightning bottle and cut it down... In the dark, it’s really beautiful. It’s like this little blue beacon, but during the daytime, it’s kind of scruffy. Oh, and I left the price tag on the thing. It’s really scruffy, actually, and you can see all the wires inside. It was like that night and day, drunk and sober. I took that around my neighborhood and found some spots where I thought you might do some public drinking and photographed it there.*

Throughout this version, the performative aspect of the documentation is key to the process. This makes it related to the artistically driven process in the cello project, mentioned above:

*I feel like even with the bottle thing, the way I was making the object really came from something I learned from your workshop. They’re not designed, actually... They’re kind of purposely outside of my design skill set. Even the type, I just used, what the really simple screens are capable of doing. It’s almost like a way of not designing, but then I feel like the... this is another thing I found from your workshop. The performance of the documentation I think is a really... for me, that’s where the research really starts. Yeah. That’s what I’ve been doing.*

Here, the workshop techniques has been deconstructed to such an extent that, what remains visible, is an artistic stance and a personal dialogue within an artistic process. As such, it almost forms a full circle back to parts of the theoretical framework that inspired me in the first place, while at the same time being completely personal and new, in another persons framework and context. The project mentioned above is published in the paper, Feral Screens: Queering Urban Networked Publics53.

---

12. Discussion of Emerging Elements

The workshops reported here, can be seen as an attempt to facilitate a lived experience of engaging directly with an essentially imaginary object. We build these tentative and hypothetical objects as non-functional models out of everyday materials, and each outcome reveals insights and concerns, but as importantly, the process temporarily frees us from considering practical and technical limitations for design.

In the resulting model object, several planes collide: that of the possible, the unknown, the feared and the desired. The model is informed by concern and longing; but built from candy and cardboard and other difficult materials, often chosen for their trickiness and lack of permanence. The result is a physical entity, a prop that temporarily embodies a continuity error: It should not be here. It is as out of context and alien as a ballpoint pen, carelessly left behind in a period-drama shoot. While it is here, it allows us to engage with its potentiality, to mark the space around it, and to rehearse living with its tentative context. It is important to note, that such models are not predictions of future technologies in any other way, than the notion of future/unknown serves as a prompt to force a reflection upon the present.

Each sketch is temporary and serves only as a stepping stone toward the next one, the object in itself loses value as soon as the following step has been made. But, as we stand up and handle it, the model makes itself available to us in a temporary performative space, as we consider what it is, and how it may embody the unknown. In this process a number of underlying concerns emerge:

- Magic and Magical Thinking
- Thinking Through the Prop
- Objects that Leak
- Responsibility, Commitment and Risk
- Workshop as Gift Exchange
- Creating Design Knowledge
Magic and Magical Thinking

The notion of magic merits further scrutiny. Malinowsky defines magic as a pragmatic collection of ineffective techniques (1960); while Alan Moore calls magic the art of changing the world with words (Parkin 2013). Both of these definitions cast light onto the workshop process where, by focusing on an immediate emotional concern, we are opening up a temporary space, in which we may indeed be able to change the world with words, and propose effects and capabilities that may not bear out (yet). At the same time, the current mainstream technological object defy our understanding, and can increasingly be addressed as a magic device itself. This approach to technology as a *magical unknown* (which might very well be addressed through cursing, tokenism and ceremony), is not that far from currently emergent practises of air-gapping⁵⁴, caging⁵⁵, and physical key verification⁵⁶. As such, this language allows us to reference large and complex cultural norms, whilst remaining nonspecific as to how a given future technology might actually work.

In ‘River of Shadows’, Rebecca Solnit describes the shift, from a worldview where nature provides a context for magic and wonder, to a more modern view of supernatural technologies. ‘In the beginning electricity seemed spiritual, a form of the life force: it is electricity that brought Frankenstein’s fictional monster to life in the teens of the nineteenth century, and a spiritualist machine of the 1840s that was supposed to generate a soul was electrical. Telegraphy was sometimes thought to magically transmit objects rather than signals, and in 1878 the San Francisco Chronicle published a story about a man getting evening calls from the dead on that new electrical invention, the telephone, whose disembodied voices still seemed uncanny...’ (2004)

Here, we see the how a new technology creates a knowledge gap, that is then filled with notions of magic and its associated phenomenon, *magical thinking*. Magical thinking can be described as a basic misinterpretation of the causal relationships between objects and emotions, or word and actions. According to Frazer, this depends on two laws: The law of similarity,

---

⁵⁴ [https://www.wired.com/2014/12/hacker-lexicon-air-gap/](https://www.wired.com/2014/12/hacker-lexicon-air-gap/) accessed 7th of June 2017
where the effect resembles its cause; and the law of contagion, where things, which were once in physical contact, maintain a connection even after physical contact has been broken. The basic premise is that like affects like, or that one can impart characteristics of one object to another (1911). If an unknown object acts or looks like a known one, it may have similar characteristics, or even carry some of the original object’s essence. Even if the magical object does not actually look like the target, it can be contaminated with the target through physical contact of some kind; and it can maintain such a connection, and through that, some element of influence or power.

In the workshops, it is clear that the notions of magic and technology become tangled and complex, but for our purpose here, this is not necessarily problematic. By employing the sleight of hand, the curse, the untruth and the exaggeration, we are able to provide a large amount of head-room for the technological visions that emerge. They can do anything you can imagine, which points right back to the key question: What can you imagine?

**Thinking Through the Prop**

The outcomes from the workshops can be seen as props, animated and investigated through the live presentation at the end. The prop allows us to fantasise and guess about its functionality and use. Certain features will be accidental; dictated by the material available and the short time in which it was built; but as the maker stands up to explain and play, all features (intended and unintended) work together to inspire and inform the presentation. In that moment of heightened alertness, the prop itself instructs us, as to how it should be handled and used.

This process makes use of mechanics similar to pretend play: The ability to represent one object as two things at once; the ability to see one object as representing another; and the ability to represent mental representations (Lillard 1993).

The child knows, that the stick in his hand is a stick and yet at the same time, within the game it is also a sword. We can hold these two realities at once; they are both in true simultaneously. This is reminiscent of Callois’ game spaces, where we erect a metaphorical tent in time, in which experimentation can take place.
Fig. 37. Thinking through the Prop (ADE 2016).

Fig. 38. Thinking through the Prop (ADE 2016).
Leaky Objects

This work essentially postulates, that embodied making processes support a nonverbal form of thinking. As an object takes form in front of us, we develop intuitions about its capabilities and behavior (see fig. 32). In this sense, the building process is a dialogue between, the intentions of the maker and the limitations of the material, and the object itself. Each small modification opens up new possibilities for the ongoing building process. If we consider this in the context of Hayes’ naive physics (1978), we can say that it is through the process of making that we begin to comprehend the objects, we are building. Montessori used blindfolds for the process of reviewing materials, stating that the eye can interfere with what the hand knows (Lillard 2008), and the idea of representing and developing thoughts through the manipulation of physical objects has had a strong place in education since Froebel’s early ideas of the kindergarten (Brosterman 1997).

It is in this sense, we can suggest that the workshop outcomes are leaky. They are initially created as simple models in response to a particular situation and a set of prompts, but as they appear during the workshop, it seems as if, they both absorb and leak knowledge and complexity. In the presentation and discussion, a clear multi-directional connection appears between the words, the material, the model and the maker. It is this bringing-forth, that allows an almost poiesis-like process of calling something into existence that was not there before.

In an associated manner, Roger-Pol Droit describes things as ‘folded propositions. Or the folds of ancient and vanished phrases. Or the solid residue of extinct words’. He asks ‘How are things?’ and he describes them like this: ‘The freezer is a machine of secrets. It belongs to the family of thing-enigmas, which perplex us and which we approach with hesitation: the sense of a surface, of volume of a door, of an interior which can be accessed. All of which tells us next to nothing. Things of this kind are self-enclosed, keeping their counsel. Boxes containing mysteries. We become used to them, we draw our own conclusions, but we never really discover how they work.’ (2003)

The machines built in the workshops are more forthcoming. Since they don’t actually work, they must express themselves through their makers. As a result, they leak knowledge, power, context; they are handled
roughly by the process, sometimes starting out as one kind of thing, and ending up as another, through conversation and discussion\(^57\). At the end of the workshop, any concerns present in the room must find ways of expressing themselves through the machine, and the machine in turn must take on an identity of its own. It now exists in a world, where previously it didn’t. It is a physical manifestation of a technological fantasy.

**Responsibility, Commitment and Risk**

As in any kind of performance, the first seconds and minutes of the workshop experience are critical. This is when the story starts, the players assemble, and from this moment the relationship between the participants and facilitator is central. This is not a lab based experiment, it is more akin to a performance, which is not necessarily replicable in a scientific sense; however, it is repeatable, like a play or a ritual.

Over the years, I have changed to become a person who can facilitate this. This change took the form of a series of decisions: to make my voice clearer; to take responsibility for other’s experiences; to commit to a certain amount of *fronting* at moments of doubt; to have some trust that things work out; and to make strong decisions about procedure. Most people who teach, or who speak publicly, have been through a similar change. Anne Nigten once described it to me as ‘bicycling in the air’, and I sometimes think of it as leaping from ice floe to ice floe in winter.

The facilitator role is to initially persuade the participants to take part. Once they are committed, the relationship relaxes. Then, during the presentations at the end, a certain authority is needed again. At that moment, the facilitator must instantly become an expert on a handful of newly built *Magical Machines*, and the job is now to midwife them through the last part of their emergence. How does one pull that off? How does that happen? Where does that come from? It is counter-intuitive, but I think that fear is key, being (slightly) afraid and doing it anyway, is a powerful position to act from, and the adrenaline surge of the introvert doing an extrovert’s job should not be underestimated. These are high stakes and the commitment to power through, is one aspect of what makes a facilitator an interesting

---

\(^57\) A finished technological object leaks context in a similar way, as expressed in: Karey Helms. 2017. Leaky Objects: Implicit Information, Unintentional Communication. In Proceedings of DIS ’17. ACM. Both interpretations spring from conversations with Kia Höök at KTH.
sparring partner for participants, who might also have overcome a similar perception of peril, and are performing at a high stake themselves.

The facilitator spends time with each model in a conversation that is as serious or as playful as each participant wants. Wallace et al. describes a similar aspect of the probe process as one of bi-directional reciprocity, where the reciprocity brings conversation: ‘For us this sense of the conversation is critical; we are not just asking someone a question and gaining an answer, we are asking someone to reflect, share, surprise and reveal things to us in a cycle of atypical gestures. Within this simple premise are rich layers.’ (2013) Such attention to care and concern is recognisable in the Magic Machine workshops too.

The workshop is effectively used as a temporary safe space, and the role of the facilitator is not only to safeguard that space and take care of ethical concerns like consent; but also to take responsibility for the way the work is handled, recorded and photographed. The documentation is done very explicitly at the end of the workshop, and the process involves sharing and evaluating photos immediately with the participants. The goal is to make the documentation process an intrinsic part of the workshop experience itself, to allow the participants to be authors of the outcomes, rather than subjects for observation.

**Workshop as Gift Exchange**

Through the process of writing, I have begun to wonder, if we can see these workshops as a gift exchange, in the spirit of Mauss’ classic book, ‘The Gift’ (1954). In such a framework, the invitation to the workshop itself might represent a thrown gauntlet or a wager, and the agreement to participate as acceptance of the challenge. Lewis Hyde (1983) proposes the origin of gift-economies in the sharing of food, citing the Trobriand Islander protocol of referring to a gift as ‘some food we could not eat’, even though the gift is not actually food. In our case, the gift is a moment of attention, a opportunity for expression, and the willing participation itself. If, the initial workshop prompt can be seen as a gift offering; perhaps then, the follow-through by the participant, becomes the clinching gift58, which cements an alliance or a truce, and confirms an agreement to engage in an exchange. The workshop outcomes are then valuable only

---

58 As described by Mauss (1954).
within this exchange: as it is executed and closed, the physical outcomes fade back into non-value again. The prototype itself has fulfilled its purpose. What remains, is a knowledge object, anchored in the residual imagery, memories and recordings. What Mauss might call, ‘knowledge hoarded for the joy of having it.’

In this manner, we have an invitation, matched with an acceptance at the start of the workshop. The workshop itself, is focussed on the making of a thing that is temporarily greater than the sum of its parts. This object is essentially the product of a meeting between two realms: the participant’s experience and frame of mind; and the artificial environment of the workshop, as upheld by the facilitator. The outcomes of the workshop resides in both realms, and therefore does not belong to any of them\(^59\). Instead it is a boundary object, existing in the overspill in between the two spaces.

Ultimately, it can be taken back in both directions, having lost its magic, but containing a knowledge, which has its origin both in a personal concern and a concern from the other realm. If we accept this framing, this process might constitute an underlying outcome of the Magic Machine workshop technique.

**Creating Design Knowledge**

What is the nature of the design knowledge generated here? The process is focussed on redistributing and reframing a given design inquiry, with the aim not to solve and control a problem, but rather to address and suggest strategies for coping with a concern. The outcomes are driven by properties rather than form, with a strong constant being the embodied experience and everyday interaction with an extraordinary object. While the ultimate results are driven by conversation and language, the main component of the process should be understood in the sense of Dewey’s *experience* (1958), where we work with ideas, not just in the form of description, where only language can become knowledge and meaning, but rather as a *process of becoming* that allow us to create patterns through embodied experiences. I would like to suggest that Design Research in this context lies in the generation of material, which then becomes the basis for discourse, allowing meaning to be ascertained *after the fact* of its creation.

\(^{59}\) In the spirit of Roland Barthes essay Jeunes Chercheurs (1972).
This stance is in line with the so-called new materialism, which counters the idea that nature is solely reflected in language, and that language is the basis for our concept of reality (Barad 2003). For design knowledge, this could mean creating knowledge that does not borrow its structure and representation from other fields. Rather insights are drawn from within, and is intrinsically of design, in the sense that design itself, its materiality and imagery contributes knowledge that can be written about and described, but which does not necessarily originate solely from language and discourse.

This is the central concern that rises from these workshop experiences, the desire to make first; to wordlessly go about the construction of things that are then suddenly there. After their emergence, we can talk about them, argue and debate, probe and prod, until we know what they are for.
Fig. 39. Workshop Materials.
13. How to do a Magic Machine Workshop

In the following, I will outline a basic recipe for the execution of a Magic Machine workshop. It consists of a set of considerations, ingredient lists, and points of attention. It can be used to form a starting point for making the workshop fit into a particular context or set of concerns.

Consider your Context.
The goal is to create an open-ended exploratory experience for participants that might not otherwise engage in such activities. Consider your context, your location, and your intended participants. What will engage and intrigue them? What kind of language would they use? What are the underlying concerns that you would like them to consider? Use these considerations to create an appropriate set of prompts. As inspiration, consider the following examples:

a. Index cards and charcoal (See Edinburgh 2017)
b. Permanent markers (See ADE 2016)
c. Index cards and envelopes (See Anti-Solutionist workshop)
d. Cards printed with the ‘Basic Human Desires’ (See OWL workshop)

Consider your Location.
Ideally, the workshop is conducted in a quiet space with a large central table and good light. Less will do, the workshops have in the past been conducted in bars and corridors, but the ability to create a concentrated environment is important. The ideal number of participants is between 8 and 12, depending on the space and the age profile.

Choose a Set of Materials.
Pick a set of materials that reflects your context, but remains mundane and everyday. Avoid coloured materials, readymade shapes (such as boxes) and drawing materials. A basic set of materials and tools could be:

- flattened corrugated cardboard and box cutters,
- disposable cups, paper plates and plastic forks,
- masking tape and hot glue,
- a roll of twine and scissors,
- paper clips and pins,
- a roll of metal wire and wire cutters.
Execution and Flow.

1. Introduction.

2. The participants are provided with a prompt activity.

3. The participants are asked to use the available materials to build the ‘machine’ that addresses the prompt.

4. Participants are then asked to present their ‘machine’ to the rest of the group as a performance or demonstration.

5. Each presentation is discussed and questioned in the group.

6. Each ‘machine’ is photographed and documented.

Timing and Pace.
Go through the workshop at a high pace: The first two steps should be done in less than ten minutes, and the making will take 30 to 45 minutes depending on the group. Pay attention to the group, and modify your timing according to the mood. The entire workshop is normally concluded in 1-2 hours. If you want to conduct documentation or interviews at the end, allow for more time.

Documentation.
At the end of the session, ask participants to pose with the object. Do not video the entire workshop, it can limit and change the way participants interact. If recording the final presentations, seek explicit and informed consent and make sure equipment is obvious and obtrusive.

Some dos and dont’s.

• Be careful not to over-brief participants.
• Be mindful of the time and keep the initial steps brief.
• Conduct the workshop in such a way that all participants are heard and seen.
• Respect a participant’s desire to not be recorded or photographed. Make explicit and deliberate documentation after the event.
• Be available to debrief any participants, who may have questions and concerns after the workshop.
14. Contribution and Conclusion

The drive for this writing process, has been to investigate and examine a set of workshop experiences, to see if broader elements of knowledge can be detected. The aim of this particular text has been to find ways to express such knowledge objects and investigate, how such claims might be substantiated and contextualised.

Looking back, it is clear that, while the Magic Machine technique generates of a certain kind of material, it is limited in terms of what it can be used for. The workshops are challenging to facilitate, the initial on-ramp experience requires strong commitment, and it is hard to maintain a truly open structure of the live experience, as both facilitator and participants become invested in the success of the outcomes. The outcomes themselves are difficult to evaluate, they are broad in scope, and might not answer the concern, the facilitator (more or less unconsciously) arrived with. The insights can be intangible and hard to capture, and the act of turning them into data can even sometimes be at odds with the premise of the workshop experience itself.

It is also clear that the shift, from language-based ideation methods to a making-based one, is only helpful with groups of participants that are not already primarily thinking through the making of objects. For a trained designer or architect, the Magic Machine workshop is really just ‘another day at the office’, and the creative relief of making does not materialise here. For such groups, the restricted material choices and the performative presentations will sometimes work, but the main audience for these experiences are participants, who do not already use making as a method for sketching ideas. The workshops are also not helpful in evaluating a mature design proposal, and they are rarely effective on their own as methods of requirement engineering. Instead, they can critique underlying assumptions, shift elements of control back to participants, and evaluate the framework and vision of a given design query.

The material, brought forward here, is selected to illustrate a subtle communal narrative from a number of projects and experiences. It manifests as a technique, constructed from a series of restrictions and concerns, created in order to allow a certain kind of creative experience to take place. There are many other ways to engender such experiences, starting
with the creative artistic methods that form my early inspirations. The outcome here is just one potential point of departure for such a process.

The main lesson I take away, is a deep acknowledgement of how each experience shapes our understanding of the ones that came before. This happens *en miniature* in each individual workshop. As the Magic Machine gains its form and purpose through the process of making and discussion, it seems inconceivable that it could have ever been anything else.

At the Ringve Music Museum in Trondheim\(^60\), which holds an extensive collection of musical instruments, they have established a method for deciding when to stop allowing a particular instrument to be played. As a musical instrument ages and becomes more fragile, a full risk/gain analysis must be performed for each performance. At the moment, a particular instrument is deemed too fragile to play, a special event is planned. This event will be the last performance of the instrument, and it will be played by the best musician available. The performance will be documented and recorded, and in effect the event acts as a funeral of a kind. The instrument will no longer be an instrument, instead it will be an untouchable object in a museum (de Bruyn 2014). The event is a wake for a thing, that will now just be an object.

I would like to propose that we may also need the opposite rite, to mark the moment when an idea or a notion, becomes a thing, finds its form and purpose. Looking back from this vantage point, the Magic Machine workshops may be my attempt to force and rehearse such a reckoning. The self-made model is allowed to host an emergent, but temporarily *thing-ness*, and we in turn are allowed to take a moment to consider it.

As it stands, the Magic Machines workshop can be seen as a research strategy or technique. It is an addition to the existing family of methodologies, not meant to replace, or even critique, user studies or requirement engineering. Instead, it is aimed at providing an additional opportunity to set the scene for an inquiry or concern. In this very basic form, it is a two-hour experience, a co-acted performance or a game with a beginning and an end. At its base, lies a Coleridge-esque *willing suspension of disbelief*\(^61\), and the

---

\(^60\) [http://ringve.no/en/](http://ringve.no/en/), accessed 7th of June 2017

\(^61\) ‘That willing suspension of disbelief for the moment, which constitutes poetic faith.’ Samuel Coleridge, *Biographia Literaria*, 1817, Chapter XIV.
rapid construction of a temporary social agreement. Within this agree-
ment, we may consider complex, difficult and naive things; and propose
solutions that, while they may not solve anything as such, touch upon no-
tions of dread and desire. This allows us to temporarily engage in subjects,
we might not otherwise address; subjects that are either too difficult, or
too banal, to be addressed by the traditional design brief as we know it.

By invoking magic as a motif, we allow ourselves license to temporarily
suspend the disenchantment of the world, as described by Weber (1917),
and instead engage with enchantment as the manner in which, we can take
the metaphor of magic seriously - not as Malinowski’s pragmatic collection
of ineffective techniques (1960), but - as an opportunity to temporarily
wield immense power and consider its implications. This power shift is
another key aspect here: the temporary social contract of the workshop
requires that each participant is taking part on the basis of a re-alignment
of authority. As the cartoonist Chris Ware puts it, ‘When we were weak, we
wanted to be strong; and when we were very weak, we wanted to be very
strong.’ For such power imbalances nothing less than magic and super-
hero powers will do, and the workshops are executed in this spirit.

I have attempted to ground my work in a designerly kind of evidence, in the
knowing acknowledgement that such evidence will always be subjective and
interpreted. The question this raises is, interpreted by whom? My solution
is to leave the interpretation to the group within the workshop experience,
and thereby make the validation personal and distributed amongst the
participants. In this text, I have performed a set of tentative design evalua-
tion of the most common outcome types. These are done solely to evaluate
the outcome of the workshop structure itself, not in terms of each model’s
thematic content, but in terms of its ability to convey openness and flexibil-
ity, to act as a vessel for the participants’ interpretation.

My knowledge contribution is to offer the Magic Machines as a distinct
technique into the existing family of design methods. It’s aim is to generate
short, intense bursts of expression with participants from a broad range of
backgrounds and expertise. Rather than gather feedback or requirements,
it expresses underlying emotional content and notions through an

---

This quote comes from the Superpowers episode of the This American Life pod-
cast. https://www.thisamericanlife.org/radio-archives/episode/178/superpowers,
accessed 7th of June 2017.

---
embodied process of making. Instead of developing ideas through conversation and language, the main move here lies in the making of non-functional objects, through a series of artistic distractions and obstructions. Strict timekeeping and obstructive material choices allow a converse freedom of expression, and liberate participants from existing technological concerns and limitations. While the making takes a central position in the process, the made object is not important in itself, but rather, it forms the container through which a vision or idea might be relayed.

The proposed designs are often fantastical and technically impossible, made to work only by the inclusion of hitherto unknown technologies or magic, and understood in the sense of a non-scientific expression of extraordinary ability. The results are visions of what-may-be, and as such they do not necessarily foreshadow a far-flung future, as much as they reflect back upon our fears and desires for the present and the near-future. They present an opportunity to reflect on our everyday lives through the imagination of impossible things.

The method generates a consistently high quality of outcomes (see the Appendices), in the sense that the resulting imaginations have:

a. Strong personal identification and commitment from their creators.
b. Distinct and unusual ideas.
c. High levels of engagement in the post-making discussion.
d. Expressing desire rather than rhetoric and jargon.

Outcomes are gathered in a number of ways and in different modalities:

b. Open-ended imaginations in the form of recorded interview material (see Andersen, K. and Knees, P., 2016, May. The Dial: Exploring Computational Strangeness.)
c. Design material as it relates to textures, shapes, functionality etc. (see Je Eigen Gang Gaan / Modular School, pending publication)
d. Documented stages of design processes (see Andersen, K., Gibson. D., The instrument as the source of new in new music)
The findings supporting the proposal of this technique are:

a. Making-before-talking can buy the participant time for contemplation and a different way of engaging in embodied wordless thinking, facilitating an arriving-at-an-understanding, that can be felt, before it can be expressed.

b. The action of presenting through a physical representation, allows the participant to let that thing embody and support an emerging idea.

c. The rush of public speaking may force participants to improvise towards narratives, and develop them on the spot.

d. These made-up-on-the-spot ideas are the result of a combination of the physical reality of the model itself, and the contemplation that occurred, while it was made, released in a live performative moment.

e. The final conversation is enacted as an urgent conversation, entirely aimed at refining the idea towards its most radical potential. This unlocking or unpacking of an idea is loosely based on the format of the design critique.

Fig.40. Result from the matchbox workshop.
Barad’s description of the now as an ongoing re-creation of past/future, suggests that we are all continuously becoming. I would like to suggest that we are not so much *thinking with our hands*, as we are changing ourselves: becoming the person who built that thing. As we handle an object for the first time, the thoughts that are acted out, are created in a complex collaboration between the object itself, the situation, and a performative moment. As this moment begins to act through us and experience emerges, we may in turn be changed into owners of new thought.

Basing his argument on Sartre, Rapport describes imagination as characterised by a ‘going-beyond: going-beyond a given situation, a set of circumstances, a status quo, going-beyond the conditions that produced it’. It is this *going-beyond* that allows us to stay ‘continually in the process of forming and designing’ (1999), conducted between what Butler calls ‘the limits of what I might become and the limits of what I might risk knowing’ (2001). In the book, ‘Giving an Account of Oneself’, she states that we are required to ‘risk ourselves precisely at moments of unknown-ness, when what forms us diverges from what lies before us, when our willingness to become undone in relation to others constitutes our chance of becoming human’ (2005).

My contribution here, is a basic set of instructions that we can use to invite each other into an experience of risk and change, allowing us to question, elaborate and take into account, a more complex understanding of our worlds. These techniques do not predict the future or result in new product designs. Instead, they are an exercise the continuous imagining ourselves and the world, as we and it might be.
Postscript

Let’s return for a moment to the lavender jelly recipe, I described in the beginning. Recipes do two things for us; they are notes we write to ourselves, to remember the details of how to do something; but they are also ways for us to share that knowledge: we can cook a new thing using a recipe. As a child, I had ‘Home Economics’ at school, and one day I found myself having to ask the teacher, ‘How much salt do I put in the potatoes?’ She answered, ‘Everyone knows that’, and left it at that. (I improvised, it turned out ok). Every recipe has an unspoken context, a set of rules that are invisible to the author, because everyone knows that. Much of what I have written about here, falls into this category. We work together and build something, and the result is sometimes surprising: Everyone knows that.

In this text, I have tried to stop for a moment and pay closer attention. I have tried to describe the things, I know. Much of it is self-evident, if the reader is from a similar kind of place as me, while still, many more things remain unseen, under-described and unsaid. My privilege and education, my cultural background and sensibilities, all prevent me from seeing certain things. Nevertheless, I have tried to write a recipe, one that works as a reminder to myself, but also one that might work for someone else. I do not claim to know, how your result might turn out, your own context and preferences, your own blind spot, will ultimately prevail.

The recipe for the Magic Machine is not a guarantee for a predefined set of outcomes. It is a beginning of a process, in which we pay closer attention to the workshops we do, modify and tweak, to adjust to where we are, and what we are trying to do. It is a call for taking our responsibility as workshop facilitators, to conduct workshops that are safe, inclusive and non-normative, or as non-normative as we can manage, but also an acknowledgement that yes, we influence the outcome, we judge what object to photograph, we want things to turn out well, to be useful. The materials, we choose drag the outcomes in certain directions: the bottlecap wants to be a button, and the box will fight to remain square. Like shopping trolleys with a bad wheel, they drag to the left. This is only a problem if you do not pay attention, if you do not see it.
Dourish points out that: ‘ethnography is not only “about” the culture under study, but equally, implicitly or explicitly, “about” the cultural perspective from which it is written and that of the audience to whom it is presented (2006).’ He goes on to reference Clifford Geertz’s description of culture as ““stories that people tell themselves about themselves,” and, by the same token, by telling an ethnographic story about some Other, the ethnographer also tells a story about ourselves’ (ibid). William Gibson expresses a similar stance when he writes: ‘We can’t see our own culture very well, because we see with it.’

I would like to suggest that the workshops we do, in a similar manner, reflect back the questions we asked, the materials we provided, and the people we recruited. Instead of ignoring or trying to mitigate this cultural fault line, we may make active use of it to create stronger and more explicit frameworks for workshopping, and to pay attention to the process as it unfolds across that fault line. Ultimately, our work may then shift from being academic and designerly justifications, and instead emerge as complex and multifaceted stories that we tell each other, stories about how things are, and what they might become.

---

References


Andersen, K., Gibson. D., 2017. The Instrument as the Source of New in New Music, In Design Issues, volume 33, issue 3, MIT, USA. 37-55. DOI: http://dx.doi.org/10.1162/DESI_a_00450


Appendices

The appendices consist of the following material:

Interviews Referenced
Workshops Referenced
Projects Referenced
Image Credits

Additional Image Documentation
- Outcomes from Anti-Solutionist workshop 2015
- Outcomes from ADE 2015
- Outcomes from ADE 2016
- Outcomes from JEGG 2015 / Candy
- Outcomes from JEGG 2015 / Matchboxes
- Outcomes from sIREN, Edinburgh May 2017

Overview of Associated Papers
- Paper 1: Circles and Props - Making Unknown Technology
- Paper 2: Making Magic Machines
- Paper 3: The Deliberate Cargocult
- Paper 4: The Instrument as the Source of New in New Music
- Paper 5: The Dial: Exploring Computational Strangeness
- Paper 6: Anti-Solutionist Strategies: Seriously Silly Design Fiction
- Paper 7: 821 words and 20 images

Related Papers
Interviews Referenced
Mark Blythe, interviewed by Kristina Andersen over Skype, 28th March 2017.
Matt Brennan, email conversation with Kristina Andersen, 13th June 2017.
Cleveland Johnson, email conversation with Kristina Andersen, 4th June 2017.
Karien Vermeulen, interviewed by Kristina Andersen over Skype, 5th April 2017.
Simon Waters, email conversation with Kristina Andersen, 10th June 2017.

Workshops Referenced
Amsterdam Dance Event 2016, Playground workshop, Amsterdam, October 2016.
Amsterdam Dance Event 2015, Playground workshop, October 2015.
Anti-solutionist workshop, 2015, Newcastle, February 2015.

Projects Referenced
Je Eigen Gang Gaan (The Modular School), 2015-2016, research project, Amsterdam, NL.
GiantSteps, 2013-2016, EU funded research project, Europe.
The Modified Cello, 2014, research project, STEIM, Amsterdam, NL.
Image Credits

Fig.01. Kristina Andersen
Fig.02. Kristina Andersen
Fig.03. Kristina Andersen
Fig.04. James Bridle http://jamesbridle.com/works/autonomous-trap-001
Fig.05. Kristina Andersen
Fig.06. Corita Kent
Fig.07. Kristina Andersen
Fig.08. Lyndsey Housden
Fig.09. Lyndsey Housden
Fig.10. Lyndsey Housden
Fig.11. https://en.wikipedia.org/wiki/Professor_Balthazar#cite_note-Nacional-1
Fig.12. The Internet Archive Book Images on Flickr.
Fig.13. Kristina Andersen
Fig.14. Kristina Andersen
Fig.15. Lyndsey Housden
Fig.16. Lyndsey Housden
Fig.17. Kristina Andersen
Fig.18. Kristina Andersen
Fig.19. Lyndsey Housden
Fig.20. Dan Wilton / Red Bull Music Academy
Fig.21. Dan Wilton / Red Bull Music Academy
Fig.22. Kristina Andersen
Fig.23. Kristina Andersen
Fig.24. Lyndsey Housden
Fig.25. Lyndsey Housden
Fig.26. Kristina Andersen
Fig.27. Kristina Andersen
Fig.28. Kristina Andersen
Fig.29. Kristina Andersen
Fig.30. Kristina Andersen
Fig.31. Kristina Andersen
Fig.32. Kristina Andersen
Fig.33. Dan Wilton / Red Bull Music Academy
Fig.34. Dan Wilton / Red Bull Music Academy
Fig.35. Waag Society
Fig.36. Cally Gatehouse
Fig.37. Lyndsey Housden
Fig.38. Lyndsey Housden
Fig.39. Kristina Andersen
Fig.40. Kristina Andersen
Additional Image Documentation

Outcomes from Anti-Solutionist workshop 2015
Photography: Rachel Clarke
Additional Image Documentation

Outcomes from ADE 2015
Photography: Kristina Andersen
Additional Image Documentation

Outcomes from ADE 2016
Photography: Lyndsey Housden
Additional Image Documentation

Outcomes from JEGG 2015 / Candy
Photography: Kristina Andersen
Additional Image Documentation

Outcomes from JEGG 2015 / Matchboxes
Photography: Kristina Andersen
Additional Image Documentation

Outcomes from sIREN, Edinburgh May 2017.
Photography: Kristina Andersen & Simon Waters
Overview of Associated Papers

I submit seven published papers for consideration. The papers are selected with the aim to create a certain amount of narrative flow between them. They span 5 years, and have each been written as documentation and dissemination of an ongoing inquiry spanning a number of individual, discrete projects. The first three papers describe the workshop technique, as it is developed over a number of projects; the next three papers are related to projects, where the Magic Machine ideas are forming (part of) the methodology used; and the final paper is a short art publication that contextualises the creative environment, much of this work was conducted within.

Paper 1: Circles and Props - Making Unknown Technology
Paper 2: Making Magic Machines
Paper 3: The Deliberate Cargocult
Paper 4: The Instrument as the Source of New in New Music
Paper 5: The Dial: Exploring Computational Strangeness
Paper 6: Anti-Solutionist Strategies: Seriously Silly Design Fiction
Paper 7: 821 words and 20 images
Paper 1: Circles and Props - Making Unknown Technology


This article was originally written as a paper for ISEA 2011 in Istanbul. It is a write-up of a workshop, conducted in Sydney as invited artists at the Participatory Design Conference 2010. The collaboration with Danielle Wilde is based on the meeting of our individual long-standing practices, and emerged as a shared project centered around worn devices. In the article, we describe the workshop set-up as a series of strict conceptual shifts: Introduction, Desire, Body Transfer, Material, Thinking with your hands, Being done, Description and finally Debrief. The text itself is descriptive and forms an extended set of notes, allowing us to begin analysing our own backgrounds, in Fluxus, Situationist art, and conceptual design practices (Kristina); and movement and performance (Danielle), as they fed into our collaboration. The text was written collaboratively in a shared live document, and we consider ourselves equally responsible for the resulting text.

Important notions:

Desire as driver
Creative obstruction
Knowing when
Paper 2: Making Magic Machines


This paper based on a set of earlier workshops conducted with a group of children at the 2009 Transmediale. It is the first published write-up of a long established practice of workshopping with and about technology - the first version of this particular format was executed at the 2007 Amber Festival in the Museum of Modern Art, Istanbul. The paper describes an attempt to use a fine art sculptural process to access unspoken desires and fears of the new and unknown: an exploratory children’s workshops aimed at uncovering new technological objects and needs, using craft and embodied making. The workshop uses the notion of magic and machine as substitute for technology to allow a broader range of response. I wrote the text in order to describes the process and begin the process of finding guidelines for using this type of workshop format.

Important notions:
- Early description of the Magic Machine idea
- Fear and desire as related to technology
- Initial formalisation of workshop format
Paper 3: The Deliberate Cargocult


This paper is a continuation of the ‘Making Magic Machines’ paper above. It outlines a series of workshop-like projects and discusses the underlying mechanisms that drive them. The three projects address the overall aim of creating hypothetical or speculative experiences, but they have different time dimensions: Making New Instruments deals with current or even old technology and the goal of the experience is finding the right technological solution for an immediate artistic purpose, Tassophonics addresses a near-future technology that is already surrounded by fear and misunderstandings, and The Placebo Apothecary is giving form to a completely fantastical vision of a future that may or may not happen. All of them are concerned with creating frameworks that allow the user to fill personal meaning into a ready-made object (the cup), a self-made prototype (the instrument) or a purely conceptual object (the medicine). I wrote the text to continue the process of teasing out the underlying methods of my practice. As such it forms a early form of the methods I am proposing.

Important notions:

- Visions rather than problems
- Imaginary future technologies
- Making speculative objects
This is the first paper describing the use of a modified version of the Magic Machine technique in a project context, a collaboration with musician, Dan Gibson. It was written in response to an iterative experimental instrument building process. The paper is an example of a practical application of non-functioning prototypes and fragile making, as sketched out in previous papers. The focus on the cello as a site for the work, and its inherent importance to the musician, forms the framework in which the exploration can take place. The paper itself is a combination of artist notes and reflections written by Dan, and a more structured description and framework written by me.

Important notions:
- User as agenda setter
- Performance as the moment of proof
- Enacting change
This short paper is a poster describing an unexpected insight from the EU-funded, Giantsteps project: that we might be able to make use of the artistic strategy of obstruction in the way we return search queries in a technical interface. This text is the 5th attempt of publication after a long and difficult process of finding a home for such an idea. The fundamental interdisciplinary quality of the work, made it hard to place in a computer science setting (Where is the data?), and hard to place in HCI (The algorithm theory aspect makes it ‘not a good fit’). We finally removed most of the Computer Science aspects, and the resulting paper is mostly based on the HCI perspective. The making aspect is different here, but it is included to show another potential use for some of the more fundamental notions of the Magic Machine idea.

Important notions:

- Artistic obstruction in algorithmic systems
- Peer interviews as database
- Technological ideas deriving from artistic processes
In this paper, the Magic Machine workshops forms the methodological backbone of how we interact with researchers and stakeholders. In the text, we describe two examples of Magic Machine workshops, where participants are encouraged to reject realistic premises for possible technological interventions and instead create absurd propositions from lo-fi materials. We argue that such practices may help researchers resist the impulse towards solutionism and suggest that attention to representation during the ideation process is a key strategy for this. This is a collaboration text between all the authors. I designed and executed the workshops described in the text, and I am responsible for some of the methodological aspects.

Important notions:

- Making use of the technique in a larger urban project
- Prototypes as anti-solutions
This text was written for an art publication, curated by the Dutch art collective, iii, and ultimately distributed as a part of a live performance, and as an appendix to Neural Magazine. It takes the form of 20 images with fig. texts, inspired by the Pictorial discussion that was taking place at the time at DIS 2014 and NordiCHI 2012. The images are all from my own personal practise and the archive of Michel Waisvisz (which I remain responsible for). They are all in black and white, making their age hard to determine. This allows them to be seen as one continuous stream, even as they range from 1974 to 2014. The fig. texts were written in instinctive response to the images, but not as descriptions or explanations of them. Instead the images and the texts exists side by side, and cast light upon each other. The texts take their origins in a recorded and transcribed conversation between Joel Ryan and myself, which was then continued as a back and forth email conversation. Our aim was to take the opportunity to try and address the bigger subjects informing our work in an non-academic manner. We consider ourselves equally responsible for the text. It is included here to provide an art and performance context for the work described here.

Important notions:

- Live performance
- Theatre as experiment
- The psychic as a sensitive reader
Related papers

The following list is a selection from my publications with a brief description of my role in the writing of each paper. The are included here for context.


Note: Text is co-written within the group, with Tom Jenkins taking the lead.


Note: Collaboration based on material from the Michel Waisvisz archive.


Note: Outcome from GiantSteps project.


Note: Collaboration based on material from the Michel Waisvisz archive.


Note: Semi-academic text aimed at describing personal practice.

Note: Outcome from GiantSteps project.
I am responsible for user engagement aspects in the text.


Note: Collaboration based on material from the Michel Waisvisz archive.


Note: Text is co-written within the group, with Tom Jenkins taking the lead.


Note: Outcome from GiantSteps project. Shared responsibility of text.


Note: Outcome from GiantSteps project. Shared responsibility of text.

Note: The work is also described in the ‘Deliberate Cargo Cult’ paper. Shared responsibility of text.


Note: This book will be re-published in time to be launched at CHI2018. I will update our chapter with a postscript.


Note: Collaboration paper. I was responsible for the design, execution and analysis of the experimental design work and the workshops.


Note: Playful interactions with clothes and sound.