

# Storyforming

Experiments in  
creating discursive  
engagements  
between people,  
things, and  
environments

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Doctoral Thesis



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# 1. Introduction

**You keep standing for a good while looking at the colours of the tower changing. And finally all the windows turn red again. There is someone out there that thinks like you, after all.**

(Dahl, 2007, p.204)

Throughout modern history, design has been successful in increasing the production and consumption of goods by creating new types of needs and, in a way, manufacturing desire (Forty, 1986). Today, modern life itself — and the artefacts in it — is cast in a worldview largely based on consumption and in which meaningful events are sought through fleeting product experiences (Chapman, 2005). When the often short-lived object-user enchantment comes to an end, fully functioning objects are often discarded, making for an ever growing mountain of waste. When producing new things, it is therefore simply not enough to consider only technical aspects of manufacturing and use, such as energy efficiency, choice of materials, recycling, and transportation, without also considering what kind of practices an artefacts will reinforce and what roles it will play in everyday life. Behavioural change has been pointed out by many scholars within the humanities as a key aspect of ecological sustainability, and here the design of artefacts constitutes a key element — not only by affording certain actions at a given moment but through addressing our deeper aspirations and re-configuring our life narratives. I will use the terms ‘narrative’ and ‘story’ to a great extent in this thesis and, when using them, I do not confine myself to an interpretation connected to written or spoken words, but employ a wider definition of the narrative as a rhetorical mode of discourse including artefacts\* (Buchanan, 1985).

We construct our reality in the form of material structures that surrounds us. These artefacts are a reflection of ourselves; we have created them and we understand ourselves through them. The artificial world can be seen as

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\* I will elaborate some more on this in the following chapter.

the stage on which we enact our daily life. We connect brief events to compose meaning and create a larger whole — an everyday story. There are many fragments that we might leave out of this story; even though they constitute large parts of our time awake, they seem to fade away quickly. Other occurrences become more central. We remember them longer, they constitute key events in how we build identity, construct meaning, and set out goals. By reinforcing certain practices and inhibiting others, artefacts are connected to this process, constantly part of an on-going negotiation of meaning (Massumi, 1987). As designers, we have the possibility of influencing experiences by the shaping of objects and services — reflecting in the process on what should be made visible and what should be hidden. How are our deeper aspirations and dreams manifested in our material culture?

The theme of this dissertation has evolved from projects starting not long before I began the journey of doing PhD work. At the same time as I was involved in my first research project, *Aware*, looking at energy use from a design perspective, I was working on the realisation of a large scale, interactive light installation called *Colour by Numbers*. This project was installed in a 72-metre high, unused tower previously used for telecom development in the south of Stockholm. With the installation, you can use a phone to call the tower and change the colours of the top ten floors, allowing for millions of combinations visible over a larger area in all four cardinal directions. In addition to this, you can also see the installation over the Internet through a real-time camera. The light installation became a success, receiving thousands of phone calls over the first days. It figured extensively both in traditional mass media and on blogs around the world. In time, it became a central actor in one bestselling crime

novel (quoted above) and in one prize-winning youth novel. As of this writing, seven years after its inauguration, *Colour by Numbers* still averages 24 calls per day. Did we know that the installation would be so successful beforehand? Of course, we had our hopes, but the reception has exceeded those. The way *Colour by Numbers* gained popularity intrigued me — people used it in creative ways that neither my collaborators nor I had anticipated. It became like a platform allowing all kinds of communications and expressions to arise. It took part in people's lives and manifested itself as a symbol for the area. If the technology somehow malfunctioned, we were quickly informed by people in the surrounding neighbourhood who expressed concern that the installation was not working properly.

At roughly the same time, I started working in the research project *Aware*. This project was a follow-up project at the Interactive Institute focusing on energy issues in relation to design. Its predecessor, *Static!*, had produced a series of design experiments that had received a lot of attention both within research and in the general media (Mazé, 2010). The *Static!* project explored the aesthetics of energy as material in design and by reflection in use and the *Aware* project continued in this direction.

Within the discourse of sustainable human-computer interaction (HCI), knowledge and information as primary driving forces for saving electricity started to gain increased interest. Different kinds of information devices like electricity displays, apps, and websites, started to slowly emerge through research contexts and on the market. In the *Aware* project, we were also interested in this. The idea of providing information as a form of democratic process seemed at the time both interesting and challenging. We designed

an electricity display called the *Energy Aware Clock* in an attempt to challenge the way this type of information could be communicated to electricity customers — all within the framework of the design programme. Informed by a field study, literature, and previous design experiences, we turned our attention to the gender coding of places in the household and the aesthetics associated with these, as well as in what ways the use of electricity reflected daily activities. In the design of the *Energy Aware Clock*, these themes of explorations were implemented in different ways. For example, materials and the clock metaphor were used to encourage a more central placement. In a subsequent contextual study, nine *Energy Aware Clocks* were installed into the homes of nine demographically similar households for a three-month study. The receptions were very different: while one household found the clock too visible, moving it to the laundry room, another embraced, explored, and discussed it, connecting certain electrical patterns to certain activities. For them, the display helped form a new kind of daily narrative where electricity use was more visible.

These experiences, in combination with the growing engagement around *Colour by Numbers*, made me gradually more and more interested in how one could design artefacts that afford the occurrence of certain events into a meaningful and engaging story. I had a feeling, though at the time not so articulated, that this could be an interesting design strategy within the field of design and sustainability.

The objective of this thesis is to introduce, investigate, and critically reflect on a new design programme that I call *Storyforming* — exploring ways to design meaningful narratives through artefacts. The ambition is not to answer a single research question or to criticise already existing

approaches but instead to consider an alternative way to approach design.

The design experiments that are included in this thesis were not set up with the intention of exploring *Storyforming*, since this programme has evolved out of previous programme-experiment dialectics (Brandt et al., 2011). Instead, the experiments have revolved around several different topics within sustainability and design, where *Storyforming* has evolved as a gradually more visible design space. The examples are selected from a larger set to examine different aspects that can potentially be related to *Storyforming*.

In addition to describing the design experiments, this work also reports on design interventions in the home, in the workplace, and in public, in which some of the artefacts introduced into the everyday life of participants affected their social interactions. Also, a larger participatory workshop with stakeholders has been conducted around some concepts that functioned as conversation pieces.

The thesis is laid out in five main chapters. In the following chapter, called *Context*, I will give a short background to what role design has played in society historically and contrast this to today's culture of mass consumption. I will look at how artefacts create meaning and why they become meaningful in relation to some theoretical concepts. I will also look more closely at what role objects play in everyday life. The next chapter, called *Process*, will go through design research in a general way, and elaborate on the design and design research practice. This chapter also includes a description of the programmatic research approach and a personal account of how I came in contact with it. A short summary of the publications that are included is then followed by *Experiments*.

This chapter contains descriptions of all the design experiments seen through the perspective of *Storyforming*, which is also the title of the subsequent chapter. Here I present the new programme and some properties that stand out more distinctly based on experiences from the already existing design experiments. The implications for this work are then elaborated on in *Concluding Remarks*.

## **2. Context**

**Today we live in a world of objects designed for rapid consumption, objects requiring a minimum of effort and attention to use them, but also objects that leave no lasting impression on our memories — a throw-away world that requires no effort but, at the same time, produces no real quality.**

**(Manzini, 1992, p. 239)**

Already in 1964, in the book *One-Dimensional Man*, the philosopher Herbert Marcuse sharply criticised consumerism, claiming that it is a form of social control (Marcuse, 1964). By constructing concepts of freedom where happiness is symbolised by the consumption of objects, Marcuse suggests that people act irrationally by working more than they need to fulfil very basic needs. New products are constantly produced, calling for the disposal of the older ones, thus fuelling the economy and encouraging people to work more in order to afford more. This leads to a physiologically destructive behaviour that also leaves us ignorant of the environmental damage that consumerism causes. Another danger with this is that when society provides everyone, or at least a majority, with everything needed and desired, all types of critique are absorbed by the existing structure. New radical movements become more like trends that quickly get commercialised and rendered harmless. After some time, we start seeing everything in the same way and it becomes hard to imagine a different society; we become one-dimensional in our thinking.

Society today, still largely influenced by modernistic ideals first proposed during the industrial revolution, operates under a linear perception of time instead of the cyclical conception that came earlier; speed, function, and efficiency are highly idealised and signs of high status. These types of norms have just recently started to become more questioned but are deeply embedded everywhere in society. Bruno Latour makes parallels to Walter Benjamin's metaphor of the 'angel of history' to comment on modernism:

I don't wish to embrace Walter Benjamin's tired 'Angel of History' trope, but there is something right in the position he attributed to the angel:

it looks backward and not ahead. 'Where we see the appearance of a chain of events, he sees one single catastrophe, which unceasingly piles rubble on top of rubble and hurls it before his feet.' But contrary to Benjamin's interpretation, the Modern who, like the angel, is flying backward is actually not seeing the destruction; He is generating it in his flight since it occurs behind His back! It is only recently, by a sudden conversion, a metanoia of sorts, that He has suddenly realized how much catastrophe His development has left behind him. The ecological crisis is nothing but the sudden turning around of someone who had actually never before looked into the future, so busy was He extricating Himself from a horrible past. There is something Oedipal in this hero fleeing His past so fiercely that He cannot realize — except too late — that it is precisely His flight that has created the destruction He was trying to avoid in the first place (Latour, 2010, p. 485).

The success of technological innovation during the industrial revolution led to the belief that it would bring the forces of nature and culture under control, liberating us from misery and toil and by dominating nature, producing liberation and enrichment (Borgmann, 1987). Although this is true to some extent that technological inventions and ingenuities have liberated us in many ways, this development has also created many problems — the ecological crisis stands out as a clear example of this. Still, with this catastrophe approaching quickly, the modernist (and post-modernist) machine, embodied in endless artefacts, steams onwards mediating certain actions

and inhibiting others. It is not simply a question of everyday moral decisions:

The landscape as well as the city are both highly structured, and our existence furnished with many different kinds of devices and technological systems. These are what instruct people in contemporary societies ‘how to live’

(de Vries, 1999, pp. 15-16).

New technological innovations, life cycle analyses, shifting from products to services, and an increase in recycling are all necessary and important actions needed to curb the effects imposed on the environment caused by consumerism. But they are just symptoms of the larger problem — the high level of consumption itself. Products are not just result of their primary function; they are constantly replaced for their values as signs. Mainstream industrial design has rightfully been accused of dealing almost exclusively with packaging of technology into archaic product typologies with mostly short-lived relationships with the user. Material possessions have become increasingly important as signifiers of status in a rapidly changing culture that is based on a constant evolution of new products. Today, communal values that used to fulfil many basic needs have been exchanged for an individual search for new relations with countless designed experiences.

This epoch-making societal transition has cast us within an abstract version of reality in which empathy and meaning are sought from toasters, mobile phones, and other fabricated experiences. Today, empathy is consumed not so much from each other, but through fleeting embraces with designed objects (Chapman, 2005, p.18).

Adrian Forty points out in his book *Objects of Desire* that, historically, design has been very effective in increasing production and consumption by creating new types of needs and, in a way, manufacturing desire (Forty, 1986). As an example of this, one can look at the development of electrical appliances. Although becoming increasingly popular, electricity was in the beginning of the 20<sup>th</sup> century mainly used for lighting and little else in the household. This led to very uneven power consumption with peaks in the mornings and evenings and almost zero consumption during the daytime. In order to meet demand, the electricity companies had to sustain the same high capacity at all hours, which was not very cost effective. A lot of effort went in to looking for ways to increase consumption during the daytime, and one successful attempt to achieve this was the introduction of electrical appliances. Peter Behrens, a German artist and architect, and considered by many to be the prototypical industrial designer, was hired by AEG — a company that primarily produced electricity but was beginning to enter the consumer market — to design and market their electrical appliances. This turned out to be highly successful. By combining branding and design, the demand for electric kitchen appliances increased tremendously. Common household objects like dishwashers, electric stoves, toasters, kettles, and irons were developed, designed in different styles, and marketed as signs of a modern lifestyle where household chores would be easy and fun to do. Household appliances were said to free up time, making the housewife more of a supervisor of labour than the one actually doing the work. In hindsight, studies have shown that the increased standards of washing and cleaning actually have resulted in women doing more cleaning today than ever before (Ilstedt Hjeltn, 2004).

After the modernist era came pop design that rejected the modernist obsession with functionality and durability. Putting the consumer in focus, it became more important for things to be nice than functional. In the seventies, pop design paved the way for postmodern design, completely rejecting the modernist ideals of form following function. Objects no longer merely fulfilled functions but became icons of lifestyle and social status.

As we can see, new technology and the design of artefacts and cultural norms have created a logic of life that to a large extent is organised around economic growth and high consumption, something that we know is not sustainable. Despite the fact that this is not news, there is a clear discrepancy between knowing and doing (DiSalvo et al., 2013). No matter how hard one tries to act on this knowledge, it is challenging because daily life itself, and the artefacts in it, push in the opposite direction. To change this, there is no easy solution, no silver bullet, but rather, many complex challenges that need to be addressed and questioned. This needs to be done in order to build new knowledge on how to make artefacts that reflect and support sustainable ways of living. This is the context in which this thesis operates. In the following pages, we will go through some key concepts used to acknowledge and reflect on this process.

# 1. Notions of Meaning and Meaningfulness in Design

Our life is greatly affected by technology. Inventions like the telephone, the washing machine, the freezer and fridge, the car, and much more have affected our existence and the way we define ourselves. And not only ourselves, but how we look at others as well: time and distance, our concept of cleanliness, gender, and much more change over time in relation to technological innovations. What came first and what affects the other? Do we shape these technological inventions as we see fit or do they shape us in ways that we do not entirely control? Electricity, the Internet, and even language are man-made constructions that shape how we interpret our surroundings. Previous inventions become parts of mental frameworks that are used when trying to understand something new. Inventions are often anchored in materiality; they are cast into forms and have their identities over time manifested in product topologies. The telephone and the car with their own iconic silhouettes are good examples of this. These artefacts mean something to us, but they can also be meaningful in a more existential way (Hallnäs & Redström, 2002). How do we differentiate between the *meaning* — as material mass-communication — and the more existential *meaningfulness* and how have these two concepts been approached in design?

## Meaning

How objects are assigned meaning has been approached within several different research fields. I will go through some of the more established traditions here and how they relate to design research.

## *Semiotics*

The way meanings are embodied in artefacts has found popular use in design practice through semiotics — the phenomena of signs. Traditionally concerned only with the classification of sign systems, contemporary product semiotics also incorporate how meanings are communicated through signs. Semiotics builds on the idea that an object can be read just like a text that conveys a number of semantic messages. Semioticians do not mean that the object carries meaning like water in a bucket; instead meaning is constructed in the present when the object is ‘read’. The interpretation of the object is always dependent on the context and the background (Ilstedt Hjelm, 2002). For example, different cultures might interpret certain signs completely differently and thus certain products might not be received the same in these cultures.

When designers work with products, they often use terms like signs, functions, meanings, or styles — all part of product semantics. It is said that the designer inscribes messages into the object, which are then read upon interaction with it. Of course, as just stated, the interpretation of the message can vary and the user can choose to use, or abuse, the object in different ways. Product semiotics has been used within industrial design as a way to practise ‘good design’. Rune Monö’s book *Design for Product Understanding*, which attempts to develop a language of form for product designers, has been used extensively in design education in Sweden (Monö, 1997). When creating a new artefact, one may deliberately cut and paste, merge, and make references to the common material knowledge existing in the internal cognitive models of people. This is not only a conscious strategy for designers, but constitutes a common pattern of how new inventions develop their own shapes out of the already known to gradually evolve

into an identity of their own. As an example, the last horse-carriage and the first car looked similar — the car was just a carriage with the horses removed (Ilstedt Hjelm, 2004).

Another powerful tool for designers connected to meaning is the concept of the product ‘myth’, coined by the literary theorist, philosopher, linguist, and semiotician Roland Barthes. Barthes described myths as the dominating ideologies of our time (Barthes, 1973). The myths have become so dominant, so normalised, that they seem to be completely natural and normal. They are viewed as ‘truths’. Like metaphors, myths help us to make sense of our experience within a culture. Forty states: ‘Unlike the more or less ephemeral media, design has the capacity to cast myths into enduring, solid, and tangible form, so that they seem to be reality itself’ (Forty, 1986).

### *Some Notions of Meaning from Cognitive Psychology*

Barthes and other semioticians are not the only ones to have approached the subject of meaning through our way of classifying and categorising objects in social and cultural learning. Cognitive scientist Donald Norman calls this type of classifications ‘cultural constraints’, which form behavioural boundaries that help us navigate the unknown (Norman, 1999). According to Norman, there are three forms of constraints: physical, logical, and cultural. Logical and cultural constraints are weaker than physical ones in the sense that they can be refused or simply ignored. They take a longer time to adopt, but once adopted also take a long time to go away. For example, pink for girls and blue for boys would be a cultural constraint according to Norman, while knowing how to insert a credit card into the narrow slot on an ATM is a logical constraint. Things like gates and fences are physical constraints.

Also, in the ‘good design’ tradition, the term affordance is commonly used in HCI discourse and denotes the quality of an object that allows an individual to perform an action. Made popular by Norman, the term has its origin in perceptual psychology where it was coined by James Gibson (Gibson, 1977). Gibson’s original definitions cover how an animal makes sense of its environment by means of its actionable properties, that is, the possible actions that exist between an actor and the world. Norman, on the other hand, originally used the term to denote how objects direct actions, for example, how a door handle can be designed to show users where to put their hands (Norman, 1990). According to this, the affordance is more a property of the object. It can be seen as the offered ‘action space’ that is directly perceived by the user. Norman later suggested using the term ‘perceived’ affordance instead to denote what he meant, which does not need to be the same as ‘real’ affordance (Norman, 1999). A perceived affordance is what the user interprets to be doable rather than what is actually possible.

### *Actor-Networks and Scripts*

Another perspective on users inspired by semiotics is Actor-Network Theory (ANT) developed by Madeleine Akrich and Bruno Latour (Akrich, 1992). ANT is an attempt to explain how material-semiotic networks tie together to act as a larger whole. The clusters of different actors that constitute this whole can be both material and semiotic, both human and non-human. These networks are rarely static but exist in a constant state of making and re-making. The relations within these networks are constantly performed and negotiated since they would otherwise dissolve. In this way, meanings get inscribed into — and are played out in interaction with — artefacts. Akrich likens this way of inscription

to film scripts where the vision of the designer is written into the object as programmes of use creating frameworks of action where users are obliged to act in relation to other actors within different networks (ibid.). Technical objects ‘define a framework of action together with the actors and the space in which they are supposed to act’ as Akrich puts it (ibid., p. 208). Scripting is most evident when objects are designed to configure users in a very specific way. One example of this is a particular design of public toilets where the flush button was hidden behind the raised toilet seat. To carry out the culturally embedded practice of flushing the toilet, users were required to first put the seat back down — a practice that is less universal (Ingram et al., 2007). Another example of scripting is Langdon Winner’s famous example of a set of bridges over a road that leads to a beach in New York. The bridges were built so low that only cars and not buses could pass under them. Winner argues that artefacts have politics in this way, since the bridges only let people that could afford a car, primarily white people, have easy access to the beach (Winner, 1988). Of course, the user can always reject the action-narrative inscribed into an object, be it toilet-flushing or bridges, and this is part of the negotiations that manifest the networks of actors and make them evolve.

### **Meaningfulness**

I have up till now talked about the meaning of artefacts through semiotic as well as cognitive terms to describe how meaning is mediated through artefacts, inscribed by the designer, and read and interpreted by the user. Semiotics and cognitive psychology do well in describing how meaning is expressed through form, but in this frame of reference, the possibility of items also having an agency of their own falls

out of focus. Artefacts do not exist in a vacuum. They are more than just ‘signs’ or the ‘intentions of designers’ — they have their own materiality or intentionality (Ihde, 1990) that create practices beyond what is ‘spoken’ through the language of semiotics. Next, we will look at a few theoretical concepts that better enable us to approach the topic of meaningful experiences through design.

### *Intentionality*

We have relationships to objects as things and not merely as signs, and they shape everyday practices through their material properties — objects do more than we tell them to do (Verbeek & Kockelkoren, 1998). For example, the shape of a table also shapes the way we interact; a round table versus a square alters the distance to other guests, influencing hierarchies and conversations during dinner. Writing a text with a mobile phone produces a different text than writing with a pen or a computer, and traversing a city by foot, bike, bus, subway, or car dramatically alters the experience and our view of the city itself. Judy Attfield (2000) writes of this matter:

The rediscovery of ‘things’ by design theoreticians confirms the turn away from the immateriality encouraged by theories of representation that reduce all meaning to language. (p. 7)

Another example of object intentionality is Martin Heidegger’s notion of readiness-to-hand, which also goes beyond the linguistic aspects between people and things. According to Heidegger, an object can be either present-at-hand or ready-to-hand (Heidegger, 1978). When using a hammer, our attention is not directed towards the hammer but at the nail. The

hammer withdraws from our consciousness and so becomes ready-to-hand, shaping our relationship with the world. If the hammer breaks, it no longer enables the hammering of the nail and our attention is directed towards the hammer itself — it becomes present-at-hand. This kind of engagement, the practice of hammering that the hammer provides and numerous other more complex tasks that technology enables, has also been described as the mediating property of objects. They in a way create layers of realities that only reveal themselves when something malfunctions — going from ready-to-hand to present-at-hand. The energy system serves as a good example of this, invisible and ready-to-hand when functioning, only rising to a cognitive level of consciousness when not functioning properly like in a power outage — ironically, in a way only present when absent.

### *Focal things*

This type of hidden technology, or the lack of engaging capacity, has been labelled the ‘device paradigm’ by the philosopher Albert Borgmann (Borgmann, 1987). Technological products can be seen as consisting of two main elements according to Borgmann: the ‘machinery’ and the ‘commodity’ that it delivers when functioning. The energy system, or the heating system as Borgmann uses as an example, is a device like this. The machinery is hidden away inside walls, behind covers and painted in white — the warmth that it generates is the commodity. We are surrounded by artefacts functioning like this: from basic infrastructure like telephony, the Internet, water, and electric systems to cars, elevators, computers, washing-machines, and much more. These objects have hidden machinery that delivers a commodity with the press of a button. One could say that we have

become ‘button-pressers’ of sorts, ‘controllers’ of appliances and processes instead of being an embodied part of the underlying processes (Dreyfus, 1991). In pre-technological times, things were different. For example, looking at heating, there was no heating system but a wood-burning fireplace, a focal point of the household. By using wood for making fire, the process of cutting down trees, chopping the wood into pieces, and carrying it into the house for cooking and heating gave a much more direct relationship to energy use and what certain activities required energy-wise, like cooking and heating. But the stove was more than just engaging in its maintenance — it was a focal centre in the household, something to gather around for warmth and cooking, for light, and for social interaction. Borgmann pleads for more contemporary artefacts containing this focal ability, where engagement is encouraged instead of consumption, as in the case of devices. Critics of Borgmann have pointed out that these ideas are similar to older traditions within the philosophy of technology, claiming that technology alienates humans from what they ‘really are’ or what reality ‘really is’ (Verbeek, 2002). It is highly questionable if such a reality ever existed and with many communication technologies, people experience them as also giving quality to their lives in a deeper way than by just delivering a commodity, for example, by bringing them closer to friends and relatives (ibid.). Martin Avila provides an example of this kind of difference in perspectives with a painting by the street artist Banksy (Avila, 2012). Placed in a serene country landscape is a CCTV mast, a sign of human presence. Are we being watched? Who is watching? We see this technology as an intrusion clearly contrasting the ‘natural’ scenery. But as Avila points out, there are also other traces of human presence:

There are also tracks, traces which have been naturalized throughout the years. Perhaps, even more importantly, we assume that the tracks were made by a vehicle such as a cart lead by horses [...] If this is the case, how has our human relationship with horses developed, to the point that we perceive the tracks in the image as natural rather than artificial? To what extent does the cart become naturalized in this human-nonhuman relationship? We could ask ourselves, why do we accept the imprints left on the ground and not the CCTV mast? (p. 18)

Clearly, looking at the design of artefacts through the bifurcation of devices delivering commodities or focal things encouraging engagement risks over-simplifying the implications of technology and how it shapes human practice. Still, from a design perspective, the image of the device and the focal thing can still be valuable when reflecting on how to design contemporary artefacts (Fallman, 2009). Here, this distinction is interesting to reflect on when approaching feelings of meaningfulness. We are unlikely to have any deeper relation to artefacts that we cannot see or access and these artefacts are unlikely to appear in any daily narratives except for when they break down. Drawing inspiration from the concept of focal things is interesting in that it has potential to enrich life and create well-being by creating everyday experiences that are engaging.

According to the medical sociologist Aaron Antonovsky, famous for his work on factors that support human health and well-being or ‘salutogenesis’ — the study of the origin of health — a sense of coherence is the most central

factor in how people handle stress in everyday life (Antonovsky, 1987). Coherence depends on three components: comprehensibility, manageability, and meaningfulness, where the latter element is the most important. The design of meaningful and engaging experiences therefore has direct implications for human health and the extent to which one feels that life makes sense emotionally. When emotionally engaged, we feel as though that part of life is worth investing energy in and that it is worthy of commitment and engagement.

### *Narratives as Artefacts*

The use of stories as a way to organise life experiences has been studied within the field of psychology. Narrative psychology is a viewpoint within psychology that is concerned with how people deal with experiences by constructing stories and listening to the stories of others. According to this field, human activity and our experiences are filled with meaning and stories rather than logical arguments. Whereas cognitive and perceptive psychology focus on the mind as an ‘information processor’, narrative psychology is concerned with how people deal with experiences by constructing stories and listening to the stories of others as part of a social experience — seeing the mind as the creator of meanings. Drawing on this from a design perspective, even though design is a language with its different ‘symbols’ and ‘grammar’, one should consider not only what makes up this language but also what kind of narratives this language is used to create. In his book *Acts of Meaning*, the psychologist Jerome Bruner elaborates on narratives as the primary mode of how we organise experiences (Bruner, 1990). Questioning the overly mechanistic view of human perception following the cognitive revolution in the 1950’s, Bruner’s work

focuses on the ‘making of meaning’ as a more active way of understanding one’s surroundings. The world is not just passively ‘taken in’ and interpreted but actively constructed as a way of understanding it (ibid). As was touched upon in the introduction, it has been shown that experiences that do not get structured narratively suffer loss in memory (Mandler, 1984). In our memories, experiences are systematically altered to fit our canonical representations of the social world (Bruner, 1990). When something happens that is out of the ordinary — that is, different from the existing practices of how things are expected to be done — a person who experiences this will most likely explain it through telling a story that contain reasons and in which the exception is given meaning (ibid.). Drawing on this, it is clear that stories, as human constructions, are a powerful artefact that turns consecutive events into something with meaning. The elements that allow meaningful stories to arise are knowable and reproducible, which also makes them designable.

The idea of creating objects that can ‘stage or dramatise’ is not novel. In the project *Design Noir*, Anthony Dunne and Fiona Raby do exactly this, letting the user become both a protagonist and co-producer of a narrative experience (Dunne & Raby, 2001). They compare product design to the ‘Hollywood blockbuster’ and turn their attention to its opposite, the ‘Film Noir’ genre of cinema marked by a mood of pessimism and menace, calling it ‘Design Noir’. By making products that create dilemmas rather than solving them, the user is invited to a psychological adventure (ibid.) Here Dunne and Raby challenge the status quo of mainstream product design, presenting an alternative to engage the user’s imagination through design. This is an interesting example of how one may introduce alternative experiences

that can constitute meaningful building blocks in someone's lifeworld (Hallnäs & Redström, 2002).

In the book *Emotionally Durable Design*, Jonathan Chapman devotes a chapter to 'sustaining narratives' stressing the importance of narratives as a way to increase the durability of relationships established between users and products (Chapman, 2005). The main question asked is why users discard products while they are still working. The same questions of how to create attachment and prolong product lifespan are addressed by Verbeek, who seeks more 'engaging objects' (Verbeek & Kockelkoren, 1998, p. 40) and by Manzini (quoted in the beginning of the chapter) (Manzini, 1992, p. 239). Based on this, it is clear that there is a great potential for designers and design researchers to explore sustainable and intellectually rewarding narratives in opposition to the dominant 'Hollywood blockbuster' of consumerism. The artefact as a central and present actor in forming meaningful stories together with users thus deserves further inquiry to study how this can be approached through the design process and in what ways these types of stories can emerge through the use of artefacts.

## 2. Design and Everyday Life

To understand what people are and what they might become, one must understand what goes on between people and things. (Csikszentmihalyi, 1981, p. 1)

As soon as one acknowledges the way design influences the way we think in everyday situations, looking upon the regime of industrial design as a mass medium, the utilisation of the persuasive powers of artefacts becomes a tempting instrument to wield. In the field of persuasive technology, broadly defined as the study of how technology can be used to influence people's attitudes or behaviours (IJsselsteijn et al., 2006), researchers have directed their efforts primarily at looking at how interactive computer technology can affect user behaviour through use. According to B.J. Fogg, founder of the field, behavioural change requires a trigger, motivation, and the ability to change (Fogg, 2002). A computational device can then be used to apply, for example, a factor of reduction (making some easier to do), conditioning (learning through rewards or punishment), tailoring (providing relevant information at the right moment), and tunnelling (guiding the user through a process), to name some suggested ways to change behaviour. Through the production of new consumer goods, or in this instance more specifically through computer and mobile devices, websites, and applications, users can potentially be persuaded to change their behaviours in different ways. From a wider design perspective, previously mentioned concepts within sociology, cognitive psychology, and design — scripts, affordances, constraints, and semiotics — can also be seen as instruments with similar powers.

Unfortunately for these kinds of approaches, human-artefact behaviour does not only exist within a single instance that then can be repeated to constitute the larger whole. Connected to ideas around ‘motivation’ and the ‘ability for change’ are other kinds of factors that to a large extent also influence the outcome of a behaviour.

Considering that products and places are important not only for their own sake but for the practices they enable, the importance of artefacts required to accomplish what people perceive to be ordinary ways of life becomes more clear — artefacts and practices are closely connected (Ingram et al., 2007). Importantly, practices are not fixed states of affairs. Even though they might contain habits that are repeated in certain manners, like showering daily or eating dinner at a certain time, they are part of a dynamic process where habit and practitioners evolve (Shove, 2012). From the perspective of practice theory, objects and people can be said to be ‘carriers’ of practice. Artefacts act as ‘knots of socially sanctioned knowledge’ that define a social order and direct how activities are carried out (Preda, 1999, p. 347). These activities can become practices revolving around objects, provisional relations that form complex compositions between humans and artefacts. Constantly negotiated and undergoing change, they form *assemblages*, a concept introduced by Gilles Deleuze and Félix Guattari (Deleuze & Guattari, 1987). According to them, an assemblage is a spatio-temporal composition of humans and/or nonhumans, in which there are ‘vitalities at play’ that make it unpredictable. As a result of this, material things can be said to be part of an on-going struggle to create order and meaning out of a constant stream of experiences. We live in an artificial world, arranged in such a way that it can resonate meaning and purpose back to us, at least in our

daily doings. Practices therefore make things important, but not all things, as touched upon earlier. Devices that deliver commodities rarely bestow strong attachments and the same holds true for objects trapped in the postmodern platonic enchantment, where there is little or no attachment to the actual thing but instead to the product as an icon, a symbol, and a sign (Verbeek & Kockelkoren, 1998).

Theory related to design can provide us with an understanding of design as a cultural phenomenon and contribute to our understanding of how people make sense of designed objects, although many artificial objects often constitute ‘a silent and unnoticed part of our physical surroundings’ (Attfield, 2000, p. 14) that we do not even reflect on. When designing new products that are bought, these designs are also included in an already existing ecology of artefacts, integrated with existing objects and practices within a culture of everyday life (ibid.). When brought into homes, there might be conflicts over use, ownership, and placement of objects, as well as anxieties to be dealt with regarding the disruptions new products might bring to established routines and rituals. In the case of the household, this has been accounted for through domestication theory (Silverstone & Hirsch, 1992), describing how members of a household try to make sense of and use a new artefact. According to this theory, objects and their functions are never finally decided, but are constantly re-negotiated in order to maintain control and balance within the household as the object goes through different phases of domestication.

In the book *The Meaning of Things: Domestic Symbols and the Self*, Mihaly Csikszentmihaly and Eugene Rochberg-Halton study the significance of material belongings in contemporary urban life and how ‘people carve meaning out of

their domestic environment' (Csikszentmihalyi, 1981, p. 308). People find signification in objects that are 'plausible, concrete symbols of the foremost goals, the most salient actions and events in that person's life' (Csikszentmihalyi, 1991, p. 30). As an empirical basis for their observations, Csikszentmihaly and Rochberg-Halton arranged a number of interviews in households:

In one interview a woman showed us with pride a plastic statuette of the Venus de Milo. It was a tacky specimen, with thick seams and blurred features. With some hesitancy the interviewer asked the woman why the statue was so special to her? She answered with great enthusiasm that the statue had been given to her by a Tupperware regional sales manager as a prize for the quantity of merchandise she had sold. Whenever she looked at the Venus replica, she didn't see the cheap goddess, but an image of herself as a capable, successful businessperson. (Csikszentmihalyi, 1991, p. 28)

Seeing a cherished object connects the past, the now, and the future in a sensible way and produces a feeling of order in the mind. As illustrated with the above example, not all artefacts perceived as meaningful need to be of high aesthetic value, nor do they always have to be of a nostalgic value, evoking memories of past experiences and relationships. The study indicated that younger generations instead prefer objects with a high activity potential.

What a person experiences with an object, and what the actual interaction means to that person create the perceived value of the object. The meaning of our private lives

can therefore be said to be built in conjunction with these artefacts. While Csikszentmihaly and Rochberg-Halton focus on households, I believe this holds true for the attribution of meaningfulness in a larger context, something I explore further in this work.

### **3. Process**

**What interests me is the way in which, by drawing lines, arranging words, or distributing surfaces, one also designs divisions of communal space. It is the way in which, by assembling words or forms, people define not merely various forms of art, but certain configurations of what can be seen and what can be thought, certain forms of inhabiting the material world.**

**(Ranciere, 2007, p. 91)**

Building on experimental design research, this thesis sets out, within a general discourse of sustainability and design, to critically examine the implications of affording meaningful narratives in everyday life through design. Through a series of design experiments, I investigate this design space, along with the multitude of possible outcomes, in order to better understand what this area of exploration can lead to.

In order to clarify how this research is conducted, I will in this chapter elaborate on this type of research in general and the design and design research practice in particular, positioning this in relation to the field of interaction design from which within I operate. From there, I will move on to a description of the programmatic research approach and how it is conducted both on a general level and through examples from my own experiences participating in these kind of programmes at the Interactive Institute. Being part of this research context, critically exploring the area of energy and design from different angles, the process of the emergence of a new research programme is laid out to prepare the reader for the following chapter, which contains descriptions of the experiments. Before describing the experiments, there will also be a short summary of the publications included in the thesis and in what they have contributed to the formulation of the new programme.

### Design-led Research

Design-oriented research is a science of the artificial, focusing on what should be and how to achieve it (Simon, 1996). This is in contrast to the positivist natural sciences that study how things are and what already exists (ibid.). In a science for design, the concern is how designers can change existing regularities and overcome contingencies that cause recur-

ring problems to make a difference in present and future societies (Krippendorff, 2004). Design thinkers hail from a variety of backgrounds but strive towards the same goal — to add to, or change, the real world (Nelson & Stolterman, 2003). In design-oriented research, the knowledge that stems from studying a design artefact in use or from the process of bringing it into being is the main contribution while the artefact in itself is more of a means than an end (Frayling, 1993). Still, the research artefacts are important results since they express things that might not have been clearly articulated or focused on but are up for other researcher to reflect and react on.

The resulting design experiments should therefore be seen as a form of materialised discussion and ways to map out and understand a design space. As stated by Alex Seago and Anthony Dunne, this type of design is to be seen as ‘a form of socio-aesthetic research towards the integration of aesthetic experience and everyday life through the development of conceptual products rather than working prototypes or models which attempt to simulate a final product designed for mass production’ (Seago & Dunne, 1999, p. 14). The artefacts are used to uncover unknown aspects of a topic and to disclose tensions between the designer’s various intentions, as well as to provoke a reaction in the recipient of the object. The suggestions result in scenarios that can be tested and discussed by stakeholders such as users, policy- and decision-makers, producers, and designers. This type of inductive approach has the potential to create new knowledge and understanding of what further questions to ask. It is often referred to as research through design, or simply *RTD* (Frayling, 1993). According to art historian and writer Christopher Frayling, one can, by using design to support critical reflection, gain valuable knowledge about how to design future systems of products,

places, and services (ibid., cf. A Schön, 1983). The physical results create a basis for more nuanced discussions about what we desire and demonstrate alternative possibilities to what already exists. Design artefacts act as mediators or agents of key ideas explored, rather than as mere instruments of utility. After all, design is about creating something new and not just recreating what already is. When creating something new, you always make implicit or explicit decisions that are rooted in ethics and not just in logic. For example, socio-technological concepts such as the sustainable society are related to how we wish our society to look in the future. The function of the artefact in this research context is to be a tool for thought to raise awareness and understanding of different issues and concerns.

# 1. Practice

It is now easier to imagine the end of the world than to imagine the end of capitalism.

(Jameson, 1994, p. xii)

By practice I mean an activity, the on-going pursuit of a craft or profession with a customary set of routines, contrasted to theory but not isolated from it. In the following sections, I will start out with some notes on general design practice and then contrast this to the practice of critical design, the practice of interaction design and how this work positions itself within these three practices.

Contemporary and mainstream design, as an activity, profession, and outcome seems to be ill-equipped to deal with societal issues of pressing importance (Fuad-Luke, 2005). The general public confirms this, perceiving designers as mere stylists for a rampant consumer economy (ibid.). Design is thought to deal with only the surface of products and sometimes the word is even used to describe a certain type of aesthetics as an extra product value — expressions like ‘buy this *designed* kitchen aid’ is not uncommon. Perhaps this is a good example of how closely design is linked to the mass production of goods and the manufacturing of desire (Forty, 1986). Design culture is being stuck in a cage of aesthetic convention as Stuart Walker eloquently puts it (Walker, 2002).

Throughout the history of contemporary design there have been efforts in challenging this regime. Already in the 1960’s, the anti-design movement contested design as being ‘blindly “in service” to values set by historical convention or hegemonic ideologies, espousing instead a political and

ethical agenda as proper to design' (Mazé & Redström, 2007).

Since design was supposed to be about how things ought to be (Simon, 1996), we should engage in devising such desirable realities for ourselves. A critique of society could therefore also be a critique of artefacts in its widest sense, meaning everything constructed by the human race, tangible or intangible.

### Critical Practice

Critical practice can allow new ways of thinking and practising design. Designers need not only engage in solving problems but can also take a holistic perspective questioning the reason for a problem, for whom it is a problem, and why it is a problem. Asking questions like this tends to produce results that critically rethink the parameters of the problem itself, allowing inquiries into existing conventions and norms.

Critical design, most well-known in the field of product and interaction design by the work of Anthony Dunne and Fiona Raby, aims to ask questions rather than find answers and to make complex issues more tangible and therefore more easily debated. In recent years, there has been increased attention on what critical design should be critical of (Mazé, 2009) and there have been voices raised questioning the political accountability of the field. It has been accused of having a perspective entrenched in first-world privileges, often failing to acknowledge issues of class, race, and gender (Prado & Oliveira, 2014). Others have questioned its potential as a research approach, arguing its unclear methods are difficult to adopt within HCI research (Bardzell et al.). Despite this critique, critical design has shown potential in drawing attention to the social, cultural, and ethical implications of design, aspects that are usually difficult to see (Dunne & Raby, 2001). As objects find

their forms, they become naturalised, cast as tangible myths (Barthes, 1973), and as such they become difficult to break out of, arguably even for the critical field itself. Latour uses the term 'black box' to describe a sealed network of people and things: 'A black box contains that which no longer needs to be considered, those things whose contents have become a matter of indifference.' (Callon, 1991, p. 285). To open up the black box and visualise the elements, Latour implies that something in the system needs to happen or break down. Critical design could be seen as an approach to make this happen (Ehrnberger et al., 2013).

One way of making 'it happen' is through design interventions. All design practice could be said to intervene into the world one way or another, intentionally or unintentionally. The commercial product, the exhibition, and the everyday bricolage are all forms of interventions. These interventions can be done with different intentions, for example, a research intention. Also here, the work of Anthony Dunne and Fiona Raby provides a well-known example. In their book *Design Noir*, they describe the Placebo project where conceptual design artefacts were placed in households (Dunne & Raby, 2001). The objects were designed to 'elicit the secret life of electronic objects', deliberately made to be open, vaguely familiar but still with an unknown use. The participants had to host the artefacts in their homes and then describe how they interpreted and made use of them. The designs were open-ended, meaning that the objects did not clearly solve a well-defined problem. By producing working design prototypes that can be tested in real settings, the discrepancy between design intentions and actual use allows for a deeper, more refined articulation of socio-technical relations that can be difficult to understand by mere observation. By perturbing existing ecologies, the 'design probe' provokes and exposes relations that

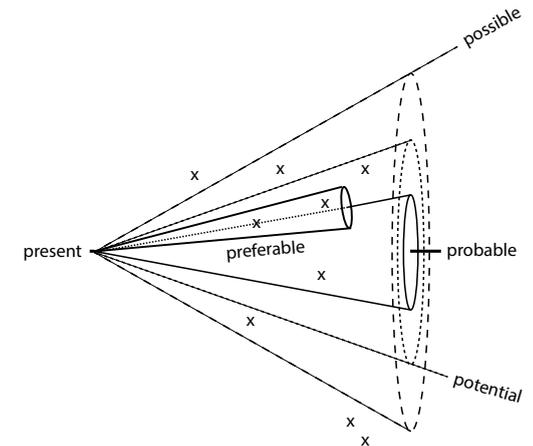
would otherwise remain hidden. The open and provocative aspect of an artefact can therefore be intentional on the part of the designer as a way of understanding use, meaning-making, and how material newcomers might be incorporated into the already present ecology of things in the household (Routarinne & Redström, 2007).

In this thesis the design experiments are situated in different contexts, levels of uncertainty, and critical examination — something that is meant to create a tension, further spanning the design space of exploration. A multitude of approaches and contexts can here be a strength in that they permit a more nuanced and better understanding of the space explored, allowing for a multiplicity of different views and standpoints. To name just one example of differentiation, the sketch, the exhibition, and the study all have different points of entry, inquiry, and evaluation. Just as light rays take different, sometimes intersecting paths depending on the entry point and angle in to a prism, existing information can be divided into multiple readings — perspectives — that overlap each other depending on the point of entry. Originally describing a physical phenomena of how light spreads in different angles when, for example, passing through a prism, feminist technoscience studies scholar Donna Haraway uses this as a metaphor to describe critical practice for knowledge making (Haraway, 1996). This is different from general notions of reflexivity, which Haraway argues do not go far enough to attend to effects that are relationally produced. Diffraction, on the other hand, allows multiplicity and differences and enables critique, thus clarifying which differences matter, how they matter, and for whom (ibid.).

The design theorist Håkan Edeholt proposes a blending of reflective practice (Schön, 1983) with Haraway's concept

of diffraction, a merging of reflection in the now and how things ought to be (Edeholt, 2004). This runs along the same lines as ideas proposed by Christopher Frayling, mentioned above. By using design to support critical reflection, it is possible to gain valuable knowledge about how to design future systems of products, places, and services (Frayling, 1993).

Critically exploring, through experimental artefacts (x), a design space of possible futures ranging from the probable, the potential and the possible. This also enables for speculation of what the preferable future should be like and how design can contribute to this.



In this way, the materialisation of concepts and theories becomes an integrated part of the designed object, allowing for a form of internal evolution of theory and knowledge as opposed to external construction (Mazé & Redström, 2007). Also, tacit knowledge embodied in discursive artefacts, artefacts used as materialised arguments in an on-going conversation (Buchanan, 1985; B. M. Tharp & Tharp, 2009), can create a basis for more nuanced discussions and reflections leading to a clearer understanding of and valuable insights into some of the numerous small and large design decisions that were not as clearly articulated at the time of conception. Standing in 'the swamp' of everyday practice, immersed in confusing but critical situations where experience, trial and error, and intuition come into play, it is unlikely that all design decisions can be articulated and reflected upon right from the beginning (Schön, 1995).

## Interaction Design

This thesis can be viewed as being a part of the field of interaction design (Moggridge, 2006). Historically, interaction design can be said to have emerged from two different intellectual strands: human-computer interaction (HCI) and the discipline of design. HCI, originating from experimental psychology and computer science, has traditionally focused on the usability and usefulness of digital products and services in predominately work-oriented situations. The focus has mostly been on the performance of the individual user. The design-oriented tradition on the other side is a combination of disciplines like graphic design, industrial design, and architecture, which increasingly incorporate digital and interactive materials into their practices. In addition to this, participatory design (Ehn & Kyng, 1991), with its strong focus on the user, can also be seen as an important influence on the field of interaction design. Even though there is a convergence of these research fields, there exist differences in the intellectual traditions that still influence interaction design as a practice. These dissimilarities mainly revolve around how the practice of design and design research is approached, the types of questions that are asked, and the types of outcome. In other words, the differences can be said to be in the degree of interest in aesthetic and ethical qualities, defining and re-defining the goal (and the question) throughout the process versus a more pre-defined goal, and the variation in importance ascribed to making ideas explicit throughout the process (Löwgren, 2010).

The definition of interaction design is still not entirely settled, although the focus on digital materials is largely agreed upon. On the other hand, there are those that disagree also here:

There is a common misunderstanding that interaction design is concerned fundamentally with the digital medium. It is true that the new digital products have helped designers focus on interaction and the experience of human beings as they use products. However, the concepts of interaction have deep roots in twentieth-century design thinking and have only recently emerged from the shadow of our preoccupation with ‘visual symbols’ and ‘things’. As they have become a growing focus of attention in the design community, the implications have emerged with force, changing many features of design practice and design education. This is arguably the centre of design research in the United States today, taking a variety of forms but always turning toward questions of action. How do we plan an action, how do we create the concrete form of experience, and how do we evaluate the consequences of action? (Buchanan, 2001, p. 11)

In this line of thinking, interaction design would be about the shaping of all kinds of products, services, and environments with a special focus on use rather than form only. ‘Like many other design fields, interaction design also has an interest in form but its main focus is on behaviour’ (Cooper et al., 2007, p. 610).

A more pragmatic argument for the coupling of interaction design and digital materials has also been suggested, emphasising the connection to the production of digital software, electronics, and the telecommunication

industry (Löwgren, 2010). As the fields of interaction design and industrial design converge, the borders certainly become blurrier. It is my impression that the majority of practicing interaction designers, at least in Sweden, work predominantly with screen-based types of design, such as user interface design in mobile applications and websites.

In relation to these traditions, I hope that the work described in this thesis might provide some interesting examples of how interaction design can encompass both different scales, from hand held devices to architectural installations, and different contexts ranging from the private to the public, and different extents through the use of digital technology as a design material. When claiming that the research in this thesis is practice-led, the 'practice' is interaction design done in a research context and with a critical design inquiry.

## 2. Programme

Moving on from a more general discussion about design research and the contexts of critical design and design research practice, we will now look closer at the research methodology.

Conducting my PhD work to a large extent at the Interactive Institute, an experimental IT and design research institute in Sweden, I have had the opportunity to become part of a research context where there has been an on-going development of a research methodology that strives to engage and cultivate design as part of the research encounter (Brandt et al., 2011, p. 9). At this time, Interactive Institute housed several artistically driven studios where I participated in some exhibition productions as a freelancing interaction designer. Prior to this, I had also conducted my master's thesis in this environment. Later, being employed as an interaction designer in the *Aware* project conducted at the research studio *Power\**, I was also immersed in an on-going discourse around how design research could offer new perspectives on energy use in everyday life (Redström, 2010). This research constitutes the starting point for what is presented in this thesis. But before giving a more detailed background of the circumstances of this, I will give a more general description of the methodological approach of an experimental design research programme.

Successful in acknowledging 'designerly' ways of working in order to produce new knowledge, the practice-based approach of experimental design research proposed by Johan Redström and colleagues has gained popularity in recent years.

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\* Later renamed to *Energy Design*.

They suggest the use of design programmes to act as a foundation and a frame for carrying out series of experiments, acting as examples, that allows for critical dissemination of what could be done and how (Binder & Redström, 2006; Brandt et al., 2011; Koskinen et al., 2008). The programme is provisional and acts as a hypothetical worldview, a leitmotif that is relevant to the overarching research question. The experiments, by themselves, act as exploratory probes testing what the programme can entail, while the combination of programme and experiments address the underlying research question (Brandt et al., 2011). In their book *Xlab*, Eva Brandt and colleagues (2011) state:

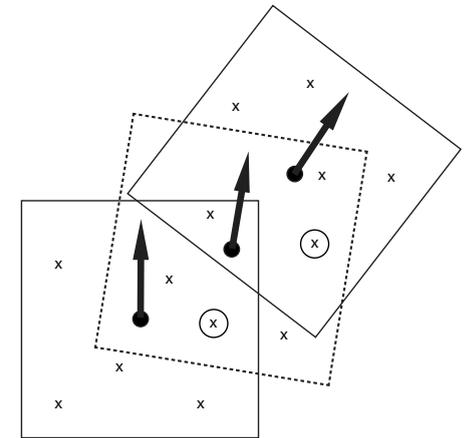
We interpret the program through experiments. Through the way we set up the experiment, we present a certain perspective on the program. Using the metaphor of a design space opened up by the program, we might say that we use the experiment to explore this space, positioning us somewhere to be able to say ‘this is what the design space looks like over here’. (p. 35)

Thus, the programme is dependent on the experiments to materialise and make tangible this hypothetical world-view and the experiments are dependent on the programme to set out frames and direction for a directed form of material exploration.

A programme can be instigated, for example, as a reaction to certain key objects made in the tradition of the ecology of existing product typologies, or it can be formed based on an earlier design experiment stemming from another programme. In this way, new programmes can be formulated as a reaction to design experiments from older programmes

as a form of internal progression or external elaboration on the ideas of other design researchers. These new programmes offer different perspectives — design spaces — where old design experiments can be seen in a new light. The new programme, a reaction to a previous design experiment, can be formulated in a way that better encompasses what is important versus what was achievable with the old programme (ibid.). This has been the case for my own research process and I will explain this in more detail below.

The progression of a series of design programmes (large squares), where the experiments (x) lead to the formulation of a new programme that is formulated as a reaction to some key experiments conducted in the older programme (circled “x”es). The new programme, as a reaction to the previous design experiments, can better encompass what is important than what was achievable with the old programme.



### Initial Design Research Programmes

I will now look closer at the initial design research programmes that this work sets out from and build on. This will continue with an account for the emergence of a new programme constituting the central part of this thesis.

#### *The Static! project*

As mentioned in the introduction, this thesis takes its departure from two different design experiences set within both research and practice. Focusing here on the research practice, we will start off from the *Energy Aware Clock*, one of originally six design experiments conducted within the

research project *Aware*, carried out between 2006–2008. Even though this was my first contact with the field of energy and design and my first research project, this was not the first project at the Interactive Institute in this area of research. In 2004, the *Static!* project had initiated the investigation of energy and design (Mazé, 2010). The project received a lot of attention and recognition both from the research community and public media and paved the way for the development of a research studio and several consecutive projects within the same area. *Static!* was set up as a programmatic inquiry with the goal of developing a deeper understanding of energy as a design material, focusing on its expressive and aesthetic potential ‘thus locating issues related to energy use at the centre of the design process in terms of both form and material’ (Mazé & Redström, 2008, p. 59). The programme was formulated as:

Aesthetics of energy as material in design: working with energy not only from a technical but also from an aesthetic point of view. (ibid. p.59)

Reflective use: treating use not only in terms of utility and ease-of-use but also in terms of critical reflection through the objects at hand. (ibid. p.59)

With this formulation, the programme focused both on exploring how designers can engage with energy as a material rather than an ‘abstract and invisible technology’ and it also focused on the deployment of design to the users in order to express issues of energy use as everyday things (Redström, 2010. p.17).

The formulation of the research programme is significant in directing the process of experimentation. In *Static!*, the programme was formulated quite openly with the inten-

tion of being suggestive in nature to drive the programme forward and to be able to open up potential and inspire the programme’s participants. This form of openness is quite different from alternative types of framing, for example, through a question like ‘How can we make people more aware of their energy use?’ (ibid., p. 22). Whereas this formulation is directed more towards an instrumental understanding of design to come up with solutions, the one that was used for *Static!* is more directed towards the use of design as a way to think outside an existing regime.

The *Static!* project had great success in developing a rich set of design examples that, through their appearance, instigated many interesting discussions and reflections on our relation to energy in everyday life. To exemplify how well the



The Power Aware Cord pulsates and glows as electricity runs through it.

project managed to propagate these questions even outside the research context, both the *Flower Lamp*, developed in collaboration with the Swedish design group *Front*, and the *Power Aware Cord* serves as good examples; they were in different years independently nominated by *Time Magazine*

for the award 'Invention of the Year'. The materiality of these discursive artefacts of course are much more accessible and easy to react to by the public than a traditional research paper which also serves as yet another good example of the persuasive influence of design.

The discursive artefacts from the project were not done as quick mock-ups to show proof of concept; on the contrary, much time and effort were put into making the examples as realistic as possible, resembling real commercial products.



The Flower Lamp opens up and closes in relation to how much electricity is being drawn off the grid.

Many of them were also fully functional. This grade of realism very often made people believe that they indeed were actual products that could be bought, something that often resulted in heated debates around these 'products'. When it comes to cultural expressions such as books and movies, critical awareness among the public seems to be much higher than when it comes to reflecting on material culture; it appears to be more taken as a given.

### *The Aware project*

After *Static!* came the *Aware* project that in many ways continued on the same path as its predecessor, operating within the same programme, but through its experiments

exploring other realms in a design space of possible material expressions. The project was initiated with a qualitative data collection phase consisting of a set of stakeholder interviews in the domestic context. The goal was to get an understanding of energy use as a socio-cultural phenomenon in the home for both the ethnologist and the designers who worked side-by-side in this process. One important reason for this setup was to give the designers first-hand experience of the home environment to bring into the design process that was initiated alongside the interview phase. To reflect the openness of the design programme, the questions put together for the interview guide not only reflected on the use of energy but also on concepts such as beauty, well-being, and everyday life, questions that could still implicitly yield answers related to the topic of energy and design. Nine interviews were conducted with informants of varying ages, family situations, and kinds of housing. The interviews lasted for around two hours and were followed by a tour of the home with discussion and photographing. The interviews were then transcribed and analysed using methods such as meaning concentration (Kvale, 1997) and affinity diagrams to inform both the design process and later reflections and interpretations on the experiments. Within the design programme, it is not just the programme that determines the outcome. Just as the programme creates a frame for experimentation, the experiment itself creates a frame for the design work. When we work with a particular experiment, apart from our individual ideas about the design programme itself, our lived-world experiences as designers and other matters also influence the design outcome (Brandt et al., 2011).

Out of around thirty conceptual ideas that were generated, six were collectively chosen for further refinement and prototyping (Broms et al., 2011). Of these six, three are accounted for