Fourth Controversy: Beyond Design by Drawing – Design by Drawing Together

So far in the thesis, I inquired into the nature of designing without a product by deploying three uncertainties that are visible in literature and practice. I examined the uncertainty on whether designing is a matter of problem solving or of advancing collectives. I explored the uncertainty on whether we can talk about design thinking and objective knowledge or about design taste making and sensitive knowledge. I examined the uncertainty on whether there are rational design processes and methods or whether we can only see design practice and methods-in-practice. Yet the project is not complete unless I examine what is argued to be the central acts of designing. When we observe designers designing, what is it that they are doing concretely?

In the field of designing products, it is commonly accepted that the central act of designing is drawing. So central is drawing to designing that many authors described the process as ‘design by drawing’ (Jones 1980). In contrast to craftsmen, who create a product by making incremental changes to the actual product, draftsmen create a product by drawing representations of it and by making changes to those representations (Lawson 2004, Cross 2011). By drawing, draftsmen obtain a ‘greater perceptual span’ (Jones 1980) of the design situations they work on. Design by drawing gives draftsmen an immense freedom to explore possible solutions and investigate implications of those possible solutions at a much faster and cheaper rate than working on the product itself (Jones 1980, Lawson 2006). For Schön and Wiggins (1992: 135), design by drawing is a “kind of experimentation that consists in a reflective ‘conversation’ with materials of a design situation”. The act of drawing is seen as being composed of many different actions, such as making plans, drawing sketches, building prototypes and mock-ups, preparing diagrams and developing computer models (Schön 1983, Orlikowski 2004, Yoo et al. 2006, Ewenstein and Whyte 2009).
Much attention has been given in the literature to the drawings, prototypes, diagrams, computer models, architects, and other draftsmen produce. These drawings are seen as valuable communication tools among designers, as well as between designers and their collaborators (Yoo et al. 2006). These drawings and models have fascinated researchers also as they are seen as the physical materialization of design knowledge and design thinking (Bechky 2003, Lawson 2004, Cross 2011). From this perspective, Lawson (2004: 33) wrote that “drawings may be seen as a kind of window into the designer’s mind and consequently into the designer’s knowledge system and method of mental representation”. Each type of drawings, from diagrams, calculation drawings, to propositional drawings, illustrates different aspects of what the designer knows at that moment about the product, from the more specific knowledge summarized in diagrams to the more general, abstract knowledge explored in propositional drawings. Design drawings and models have been also conceptualized as epistemic objects (Knorr Cetina 2001, Ewenstein and Whyte 2009), which stimulate learning by engaging the designers in a ‘conversation’ (Schön 1983), a ‘dialog’ (Cross 2011) about what is missing in the drawing and what still needs to be done.

Design by drawing has been and will remain of great importance and value in designing products. However, finding its place and role in designing without a product remains difficult to this date. Latour (2008) pointed out to this challenge in his address at the Networks of Design meeting of the Design History Society in Falmouth, UK. The challenge lies in that designing products and designing without a product are built around two different narratives about the nature of our relationship with the world. These two narratives have been visible across the chapters of this thesis. One is the narrative of the designer as draftsman, experimenter, problem solver, decision maker whose work space is composed of what Latour (2008) called ‘matters of fact’, in other words matters that are undisputed, institutionalized, stable as natural facts are thought to be, such as cognitive knowledge, objective methods, tools for representing, simulating, manipulating and communicating and close-ended products. This narrative is one of control, mastery, detachment, evaluation and progress.

The other narrative is that of the designer as a craftsman, a caretaker, who engages in designing as ‘a way of life, an end in itself’ (Jones 1980), as a traveler who appreciates the collective journey more than arriving at a destination. This designer’s work space is composed of what Latour (2008) coined as ‘matters of concern’, in other words matters that are emergent, that can always be different, that are controversial and negotiated (Buchanan
1995), such as sensitive knowledge, taste, methods-in-practice, open-ended assemblages. This narrative is one of care, empathy, attachment, valuation and advancement.

When we look at the Amsterdam Museum, we do not see a stable object, a matter of fact, an institution-made-of-one which can be indisputably defined, sketched and changed. What we see is an institution-made-of-many, an unfolding assemblage of things: of art, histories, personal stories, online communities, museum employees, members of the public, financial bodies, web designers and so on (Maris et al. 2013). Such an unfolding assemblage is difficult, if not impossible to represent in a drawing or a mock-up as it contains too many evolving elements. Any representation would only be an awkward stabilization, a freezing in time of the assemblage, which would be of little use to the designers a few days later, when all these elements would be other than they are (Buchanan 1995). The manager of the e-culture department recognized this challenge in her work:

“I am also involved in other things and all the projects are connected with each other. And that is the difference with this kind of designing, that it is so complex that you can no longer design it at the drawing table.”

The situation is further complicated as each of the actors in the assemblage has his or her own definition of what the museum as an online and offline meeting place could be. Recall the museum employee in Chapter 3, on the first controversy, who described the difficulty of initiating change in the museum. She explained how this redesign project is a matter of everybody’s concern. And everybody has an opinion about why the museum should change or not and ideas for how it should be done. In such design situations, compromises for a design proposal – as could be visible in a final sketch - are difficult to reach. Debates and negotiations are the rule.

The aim of this chapter is to explore another uncertainty about the nature of designing without a product: is designing without a product a matter of drawing and making objects work, or is it a matter of drawing things together, and making the emerging assemblage of humans and things work? In section 2, I examine the traces left behind as researchers and the designers in this study tried to come to grips with the different ways in which designers relate to the world. I elaborate further on the distinction between matters of fact and matters of concern. I illustrate how designing without a product is engulfed in matters of concern, seen in the ways
in which different designers relate to the objects of their work. In section 3, I follow the traces left behind as researchers and the designers in this study tried to understand the nature of the acts of designing. I elaborate what designing by drawing things together means and illustrate how it is performed in practice at the Amsterdam Museum. In section 4, I discuss how the move from matters of fact to matters of concern and from design by drawing to design by drawing things together makes us consider consequence in designing from a different perspective, not as a side effect of designing but as the driving force behind designing. I end this chapter with the conclusions drawn from exploring this uncertainty.

Designers’ different ways of relating to the world

The world viewed as a collection of matters of fact

Throughout design studies and histories of design, what is predominantly presented as the main object of design is the product, be it material such as chairs and houses or immaterial such as actions and services (Buchanan 1995). No matter what we take as the starting point of designing as an activity, be it the work of the caveman who invented and developed new tools, or the pre-industrial craftsman who made the objects he worked and lived with, or the designer of the industrial revolution who focused on developing the form and function of mass-produced goods, the same concern with the material is visible. Even to this date, the predominant image of the designer is that of someone who ‘initiates change in [existing] man-made things’ (Jones 1980) or imagines and conceives entirely new products that serve human needs. Industrial designers conceive of the products we use in our daily life, architects imagine the houses and offices we live and work in, fashion designers create the clothes we wear and graphic designers develop the images we look at and read.

We live no doubtly in a material world. Designers have been so far very successful in creating the products we need and want for our safety, comfort and entertainment. Everything, ranging from pencils to air-conditioning systems, cities, parks and human organs, is and can be designed today (Buchanan and Margolin 1995, Latour 2008). The largest part of design studies have been conducted in the field of product design, focusing on the work of engineers (Bucciarelli 1994), architects (Lawson 2004, 2006), graphic designers (Murray 1993) automobile design (Cross 2011), industrial designers (Lloyd and Snelders 2003), fashion
designers (Breward 2003) and so on. Product design has fascinated many researchers as it is seen as quintessential to modern life and its requirements. A number of reasons for this fascination are visible across the literature.

First, through product design, designers are able to enhance human productivity by offering products that facilitate work, communication and decision making such as computers or enterprise software packages (Kasper 1996, Scott and Kaindl 2000). Second, through product design, designers are able to advance human knowledge by providing products that stimulate learning and exploration such as books, games, space exploration technology or laboratory equipment (Kim 1989, Rieber 1996). Third, through products design, designers are able to make human life pleasant and comfortable by offering products such as air-conditioned office buildings, spacious houses, advanced kitchen appliances (Norman 1988), or products that entertain us such as TV sets or music players (Håkansson et al. 2005). Fourth, through product design, designers are able to sustain human life by engineering food, developing products that keep us alive such as heart monitors, or products that help us reproduce such as IVF technology (Orel 1995, Gosden 1999).

Reading the literature on product design, we obtain a view of the world as composed of matters of fact (Latour 2004, 2005, 2008). Matters of fact are those objects that are undisputed, well defined, objective and unintentional. Matters of fact have the same qualities as natural facts: they exist out there, governed by laws of nature. Knowing their inputs is enough in knowing their outputs. Once they are designed and implemented, they are expected to be used as intended and to generate the required outcomes (see Orlikowski 2004, for a similar characterization). For example, objects such as houses, knives, chairs or decision support systems are so common in our lives that nobody would dispute their functions: a house is for living, it should contain walls, windows, doors and a roof. A decision support system is to be used in challenging organizational settings, it needs to combine analytical techniques with the possibilities to store and retrieve data needed in decision making and it needs to allow easy interaction between participants. The argument goes that a well-designed house will provide its inhabitants with a pleasant space for living. A well-designed decision support system will facilitate organizational decision making.

Buchanan (1992, 1995) made a similar argument when he argues that in design studies, the object of design is presented as being determinate. Many design theorists have approached
designing from the same perspective as they approached science. In these studies, designing, like science, is portrayed as having a determinate subject matter which is given to the designer, in the same way as nature is given to the scientist. The designer is portrayed as a rational individual, who approaches the world matter of factly and solves design problems other people bring to him. The knowledge designers have and employ in their practice is treated similarly as a matter of fact, as laws of nature, as generalizable principles and theories across the field of designing. The design process itself is outlined as a structured, albeit iterative process, with clearly defined tasks being performed in a given order (Markus 1969, Maver 1970). The same structure of designing is arguably applied across the field, from designing chairs and vacuum cleaners to designing a university curriculum.

Buchanan (1995) extended the argument to illustrate how in these studies the perceived determinacy of the object of design is extended to the practice of designing too. In his words: “(t)here is a tendency to see determinacy in existing products and project that determinacy back into the activity and discipline of designing (Buchanan 1995: 26). Therefore, in designing, the designer tries to analyze and understand the nature of the problems he encounters or are presented to him by his clients, explores possible solutions by means of drawings, simulations and calculations and synthesizes the solution that is most optimal to solve the problem (see Simon 1969, Hevner et al. 2004, Lawson 2006, Dorst 2010). I addressed these approaches to designing in more detail in the previous chapters, when I talked about structured and unstructured design problems, cognitive theories of design thinking and rational design methods.

The products of the design activity, such as drawings, prototypes and 3D models are seen as equally determinate matters of fact, as tools used in designing. Lawson (2004) discussed different categories of drawings, employed for different purposes, such as diagrams for summarizing known information about the product, presentation and instruction drawings used as tools in communication with the client or other stakeholders, or proposition drawings used in exploring, detailing and outlining the product. Cross (2011: 12) discussed design sketches, models and mock-ups as a designer’s tools to think with. These objects are presented as external to the designer, employed to store ideas, materialize thinking and “support the ‘dialog’ that the designer has between problem and solution.” Similarly, Yoo et al. (2006: 219) described Frank Gehry’s use of drawings, scale models and 3D representational technologies as “tools for thinking and exploring ideas”. The latter means,
the 3D representational technologies, were further examined as tools to calculate costs, explore scale, and “communicate the complex geometry of a design to contractors and fabricators in a form that improves control of cost and constructability” (Yoo et al. 2006: 219). The final drawings represent the product to be designed as a closed, agreed upon compromise reached between the different stakeholders about what the product should be and look like.

**The world as a collection of matters of concern**

A number of studies of designers at work offer us a series of hints that the designers’ world is not so much composed of matters of fact, as much as of matters of concern. Bucciarelli (1988, 1994), in his ethnographic study of engineers, described how engineers work within ‘object worlds’, in other words, within different domains of knowledge, actions and material artifacts. In the design practice, the same artifact presents itself in different ways to different engineers working in different object worlds. Bucciarelli (1994: 71) argued that “the object of design, at all stages in the design, is a constructed and contested object in the sense that more than one explanation of its behavior, more than one account, or harder still, more than one analysis of its behavior is possible and meaningful.”

Ewenstein and Whyte (2009), in their study of architects, addressed the nature of the object of design by examining its representations in drawings and models. The authors illustrated how the architects in their study engaged with drawings not as stable tools to be used in designing, but as epistemic objects, as objects which are always in flux, contested and negotiated. Working with epistemic objects becomes an exploration in which the designed and the designers develop together, with the designed acquiring more concrete form, and the designer acquiring new insights, knowledge and experience (cf. Nickelson and Binder 2008, Yaneva 2009). Kimbell (2011), in her study of service design, illustrated how designers understood services neither as an activity of economic exchange nor as an economic category. Rather, they understood and related to services as contested “socio-material configurations involving people, processes, technologies and many different kinds of objects” (Kimbell 2011: 41).

On Design as Liberal Art: The Art of Advancements

Heidegger made a distinction between Gegenstand – fixed, close-ended products or objects, and Ding – emergent, open-ended gatherings or things. In design, matters of concern are those things which take different forms throughout the design process, that are open-ended, emergent in practice, that are highly contested and negotiated, a complex assembly of contradictory issues, for which different and equally valid arguments can be brought in. Matters of concern cannot be stabilized as matters of fact as they are always negotiated; they can always be other than they are.

Buchanan (1992, 1995) made the same argument when writing that the subject matter of design is fundamentally indeterminate. A subject matter of design that is indeterminate has no limits or definitive conditions; it is universal in scope. Design can be conducted in any domain of human activities, from products to services, to systems and signs. A designer would approach a task at hand based on this own philosophy or working hypothesis about the nature of the man-made world. Alternative hypothesis are possible and different designs are not excluded. Buchanan (1995: 25) explained indeterminacy in a similar way as Latour, following Heidegger, explains matters of concern, namely as contested matters, “matters that admit of alternative solutions”. In Buchanan’s (1995: 25) words:

“Designers deal with matters of choice, with things that may be other than they are. […] The essential nature of design calls for both the process and the results of the designing to be open to debate and disagreement. Designers deal with possible worlds and with opinions about what the parts and the whole of the human environment should be.”

The design space of the Amsterdam Museum is a collection of matters of concern through and through. The object of design, the museum as an online and offline meeting place, takes different forms in different work situations. For the members of the e-culture department, the museum as an online and offline meeting place takes the form of the online community that needs to be carefully hosted and maintained. For members of the financial department, the museum as an online and offline meeting place takes the form of fund raising activities that need to be carefully planned to encourage the public to contribute financially to the museum. For curators, the museum as an online and offline meeting place takes the form of exhibitions that need to be carefully designed to encourage the public’s engagement while at the same time maintain the museum’s reputation as a cultural institution.
Let me elaborate on this matter of concern, of how to design an engaging exhibition, by giving the example of the preparations for the exhibition ‘Johan and I’ on the fans’ encounter with the Dutch football player Johan Cruijff. This was the first exhibition organized in the Amsterdam Museum that engaged the members of the new online community The Heart. It was also the first exhibition of its kind, built exclusively with public stories. The idea was to create an exhibition about Johan Cruijff as an embodiment of the spirit of Amsterdam: of someone who is dynamic, entrepreneurial and inspirational to generations of people.

However, no sooner did the project start that this most friendly plan turned into a mine field, both internally and externally. In creating this exhibition, the Amsterdam Museum collaborated with Terza, an event organizing company. Both the Amsterdam Museum and Terza agreed that the best way to collect the fans’ stories was to engage the museum’s online community The Heart. Yet, both parties had different interests in the project and as such had different ideas on how to approach this task. The people working at Terza wanted to create publicity and news value for the exhibition and for Cruijff. As such, in their eyes, the best stories should be taken out of the community and saved for the exhibition.

The museum employees wanted to encourage participation and exchange of experiences by offering people a topic that is close to their daily lives, their encounter with their football legend. They considered that the best stories should remain on the site, to attract attention and to bind people together in this shared interest. A large part of the negotiations between the people at Terza and the museum employees were centered on how to encourage people to send in their stories while at the same time not giving away those stories that would give the exhibition news value. A museum employee explained the discussions carried out between them and the people working at Terza:

“Tzara was afraid that if we make all the stories visible to everybody on the community, there won’t be any news value when we open the exhibition, that the press would not be interested or less interested, or maybe the audience will be less interested in coming to the museum. I think that is an old-fashioned way of thinking because our experiences with the website is that there is no such thing… people get more involved by reading stories, they get triggered to donate their own story or put somebody else in contact with the story. It stimulates participation and the news value…well, the stuff
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we are going to do with those stories and how we are going to translate those stories into an exhibition, that’s something that will create some news value.”

Even if after long discussions, the museum employees agreed to save the best stories for the exhibition, the debate was not resolved in terms of what do to with the stories once they are collected. The difficulty of settling this debate laid in the fact that preparing an exhibition centered on stories contributed by the public was very different from preparing an exhibition centered on objects the museum already has in its collection. They require two different ways of working, which are difficult to combine. As one curator explained:

“Normally you start with an idea and then you search for objects in your collection. Then those objects form the basis of what you want to tell. Your concern is how you are going to combine these objects to form a sort of red line through your exhibition. Now we are looking for stories outside the museum, and public photos and other aspects. We still have to figure out what the results will be in two months of search for stories. Maybe it will be disappointing and then we have to be creative, see what we are going to do. Normally you do a lot of thinking first and then you act. Now we act and then we are going to think and then act again. So that’s different.”

This debate extended outside the museum between people working at Terza and museum employees, and inside the museum between different employees. The people working at Terza wanted that the authors of the best stories be further interviewed. The museum employees would then select the best, most interesting material and present it in a coherent, attractive exhibition. Some museum employees engaged in the project wanted to invite the authors of the stories to organize the exhibition and tell the story of their collective encounter with Cruijff in their own ways. Separate interviews would then be transformed into spontaneous discussions that take place between authors during the preparation of the exhibition, which could further be used as exhibition material.

Other museum employees disagreed with both plans. In their views, allowing football fans to curate an exhibition in the museum is nothing more than institutional suicide. They were afraid that the public would present only the positive side of their encounter with Cruijff, which would support Terza’s wish for publicity. They argued that it is not the museum’s task to support public figures, offering them a publicity medium. The museum needs to work with
the stories, to combine them into an objective representation of all these encounters, “otherwise we can just use the website and say ‘well, these are the stories’ and it’s the end of the project”, as one curator explained.

The ‘Johan and I’ exhibition that opened at the Amsterdam Museum had a different form than any parties involved in preparing it anticipated at the beginning of the project. The exhibition presented a timeline of all the encounters between football fans and Cruyff. Some fans became so engaged in the project that they donated objects for the exhibition, such as a football with Cruyff’s signature and t-shirts worn by him in various games. The exhibition continued to grow both online with people still posting stories of their encounter with Cruyff after the exhibition was opened, and offline with fans visiting the exhibition continuing to talk about their legend. And in terms of news value, the exhibition did attract media attention, yet its publicity was overshadowed by another, bigger exhibition that the Amsterdam Museum opened around the same time, namely the Golden Age of Amsterdam.

What these and other similar discussions in the museum illustrate is that the matters designers in this project deal with are not matters of fact, but matters of great concern. They are delicate matters which need to be treated with caution because any decision taken could have a great impact on how the museum relates to the public – as visitors, donators or participants, and how the rest of the world relates to the museum – as a cultural institution or a publicity medium for public figures. These are matters that are not well defined, not agreed upon and as such they can most often ignite vivid discussions on how to approach them.

In building exhibitions together with the public, there are no grand theories that have been tested in another museum and that can be applied here too. There are no approved methods that can be applied in designing for participation that can guarantee success. Recall the uncertainty the museum director expressed in Chapter 4, on the second controversy when he explained that they “work like pioneers”, many times feeling that they are “reinventing the wheel” as successful approaches employed by other museums do not always work in the specific context of the Amsterdam Museum.

When dealing with matters of concern, designers cannot master them, as they would master matters of fact. They cannot predict them, calculate them and stabilize them in concrete representations to be implemented later and by somebody else. Designers cannot limit their
attention only to aesthetics either, choosing as it were the most beautiful way of building an exhibition. Such a choice would be arbitrary at best.

Yet, they are still expected to come up with some programs of action (Latour 1994, Nickelson and Binder 2008) based on their experience and sensible knowledge that would indicate what could be done to take the matters of concern a step further. As empirical evidence illustrates, developing such programs of action is not so much a matter of drawing, as much as a matter of drawing things together.

**The acts of designing**

**Design by drawing**

Drawing and designing are so strongly entrenched together that many of us tend to understand the terms as synonymous. Many authors writing about drawing in design equate the two terms by appealing to the etymology of the notion of ‘designing’, to mean ‘to draw’. Flusser (1995: 50) argues that etymologically the meaning of ‘design’ comes from the Latin *signum*, which means “to ‘draw a sign’”. Orlikowski (2004: 91) writes that the meaning of the word “designing” comes from the Latin *de-* + *signer*, which means “to denote, signify or show by a distinctive mark”. Orlikowski (2004: 91) summarizes this equation of the two terms by arguing that “(t)o design, thus, is to make representations of the world.”

Design by drawing, in Orlikowski’s words, by making representations of the world, is the common way in which designing is understood in the literature, particularly in the literature focused on designing products. Design by drawing is the central act of designing in such fields as engineering, architecture, product design, fashion or interior design. A number of advantages support its extensive use across fields of designing. One advantage of design by drawing is that designers have a ‘greater perceptual span’, namely that designers ‘can see and manipulate the design as a whole’ (Jones 1980: 22). By means of drawing, designers are able to retain their ability to attend to many aspects of design at once and to work with ‘parallel lines of thought’ (Lawson 2006) without being limited by partial knowledge or by the costs of making drastic changes in the product itself. This stimulates design creativity and encourages
experimentation (Cross 2007) to a level that was unthinkable to a craftsman who created new products by making changes to the existing ones.

Another advantage is that by drawing, designers can reduce the complexity of the design situation to a manageable form. Cross (2011: 12) acknowledged that designing is too complex to be carried out “by purely internal mental processes; the designer needs to interact with an external representation” to make his ideas concrete. Lawson (2004: 52) argued that by drawing, designers are able to temporarily ‘freeze some features’, while exploring others in more detail. Cross (2011: 12) further argued that “sketching provides a temporary, external store for tentative ideas, and supports the ‘dialog’ that the designer has between problem and solution.”

Many studies were focused on understanding how designers engage in the act of drawing and with what effects. Schön (1983), Schön (1992) and Schön and Wiggins (1992) talked about design by drawing as a means for reflection-in-action. They argued that through drawing, the designer engages in a ‘conversation with the materials of the design situation’. In these conversations, it is argued, the designed – in its represented state as a drawing - ‘speaks back’ to the designer by indicating what is missing in its current representation and what needs to be done to fill in this gap (cf. Ewenstein and Whyte 2009). The reflection-in-action implies a consideration of intended and unintended implications of a design decision. Through cycles of seeing-moving-seeing and appreciative judgments (Vickers 1965), the designer reflects on the design so far, examines the implications of the moves s/he makes and as a better informed designer is able to take the necessary action to complete the design (Schön and Wiggins 1992).

Other contemporary designers describe their use of drawing as a means of discovering new insights and exploring ideas. The British architect Richard MacCorman (cited in Lawson 2004: 53) argued that by sketching, he engages in ‘a process of criticism and discovery’: “I haven’t got an imagination that can tell me what I’ve got without drawing it…I use drawing as a process of criticism and discovery.” For the Spanish architect Santiago Calatrava, drawing is a journey of exploration in which each drawing builds on previous ones, as ideas take shape. Calatrava argued, cited in Cross (2011: 14), that through drawing:
“You are discovering the layers of your project… I mean to start with you see the thing in your mind and it doesn’t exist on paper and then you start making simple sketches and organizing things and then you start doing layer after layer…it is very much a dialog.”

Other studies have examined drawing as a designer’s means for design reasoning. From this perspective, the drawings designers produce in their work are seen as a record of design thinking and knowledge (Rowe 1987, Herbert 1993, Goel 1995, Lawson 2004). Goldschmidt (1991) talked about the ‘dialectics of sketching’ in which designers, while drawing, engage in a dialog between ‘seeing that’ – a reflective criticism and ‘seeing as’ – an analogical reasoning through which the sketch is reinterpreted in light of generating new alternatives (Schön and Wiggins 1992). Do and Gross (1996) analyzed what they called ‘the acts of design reasoning’ visible in drawing, such as attention: focusing and selection, perception – filtering, recognition and processing, refinement – evaluation and memory – finding references and drawing analogies (cf. Larkin and Simon 1987). Lawson (2004: 53) focused on the cognitive aspects of drawing and argued that “drawing is also the designer’s way of making, recording and testing hypotheses”. Designers engage in testing hypotheses by continuously asking ‘what if’: what if we move the doors to the left, what if we make the handle smaller, and so on. Sketching allows designers to express these hypotheses and test them by asking questions, making moves and evaluating consequences of those moves. The final drawings present details of the aesthetics of the object to be built as well as the principles, rules and the knowledge needed by manufacturers to make a working, functioning object (Lawson 2004, Cross 2007).

While notwithstanding the great contributions such studies brought to our understanding of how designers engage in drawing products, we cannot fail to observe a number of limitations in light of designing without a product. First, drawings are a means of artificially stabilizing an otherwise fluid world. In sketching, designers take as a starting point the product requirements expressed by the client and work towards a solution that would satisfy those requirements. Jones (1980) brought this critique of stabilization when he argued that in the future, designers have few, if any, fixed points of departure. Requirements change all the time as new needs arise. Any stabilization would limit the possibilities of innovation ‘at the scale of life’ (Jones 1980). In designing without a product, Jones (1980: 33) argues, “to design is no
longer to increase the stability of the man-made world: it is to alter, for good or ill, things that
determine the course of its development."

Second, design by drawing focuses attention on just one element, a house, a car, a phone,
from the extensive assemblage in which we live in. In the designers’ drawings, no indication
is given about how that object is part and parcel of a ‘total situation’ (Jones 1980). From the
drawings, we know how an object would work internally, how it would perform once built
(Bucciarelli 1994, Lawson 2004), yet we know little of how it would work once it enters this
assemblage. Third, it supports a view of designing in steps, a process in which designers draw
first with the designed being realized later. It offers no place to consider designing as
travelling, as designing over time, in which designers are always one step behind the
designed. Last, it puts forward an image of designing as a detached practice, interested in
matters of fact: in offering solutions to design problems, in building and testing hypotheses, in
creating close-ended products. Drawings are external to the designer, are his/her means to
simplify design situations and take decisions about their future function and form of products.

**Design by drawing things together**

In conceptualizing designing as drawing things together, I look for a deeper meaning of
drawing, one that builds on the narrative of empathy, care and attachment. In the previous
chapters, we have seen how the designers at the Amsterdam Museum are part and parcel of
their design situation. Their design actions go towards initiating change in their own
entanglements with the public, the museum collection, public stories and online communities.
They do not work with a representation of the object to be designed, the museum as an online
and offline meeting place. Rather, they work with the designed itself, with emerging
exhibitions, online communities, neighborhood activities, and so on (Maris et al. 2012).

Following Latour (2008) and Oosterling (2009), who at their turn follow Heidegger and
Sloterdijk, I conceptualize design not as dessin but as dasein. In other words, design is not
about making drawings of the world, as much as about being in the world. The notion of
dasein underlines the idea of existence as dependency, engagement, empathy and care. We
observed this engagement and feelings of empathy and care between designers at the
Amsterdam Museum and the object of their work. It follows that if design is dasein, namely
being in the world, then designing is not a matter of drawing and working with representations of the world. Rather, designing is a matter of drawing things together and working with the world itself, of which designers are a part too (Jones 1980).

To clarify the notion of ‘drawing things together’, I turn to the meaning of to draw as “to pull something across a space” or “to move somewhere slowly or smoothly” (Macmillan English Dictionary 2002). To draw things together therefore is about bringing things together, about setting things in motion. Designing by drawing things together would build on this explanation as an activity in which different people and the objects they work with are brought together and set in motion in creating a new emerging arrangement, a new entanglement, a new assemblage. In contrast to design by drawing which stabilizes the world in representations, design by drawing things together is about destabilizing, about moving things around, opening things up and setting them in motion towards a desired goal.

We have seen in the previous chapter how in designing for the online community The Heart, the museum employees and web designers drew together different functionalities Mediamatic had in its collection, different topics for online discussions, different stories and pictures posted by different members. Museum employees further brought in objects from the museum collection through their daily blog posts about the ‘Object of the day’. They brought in money from public and private funds and set their colleagues and volunteers in motion to participate too in the community alongside the public. We have seen above how the ‘Johan and I’ exhibition was being created by drawing together different members of the public, fans of Johan Cruijff, different stories, pictures and objects, different organizations and their employees, different methods of preparing exhibitions and information technologies that mediate storytelling.

In order to fully understand designing by drawing things together, we need to make a drastic move. We need to de-materialize the practice of designing of its matters of fact and re-materialize it with matters of concern. This move is achieved by foregrounding and making explicit all the discussions, uncertainties and negotiations that previously went into the stabilization of matters of concern into matters of fact (Latour 2008). This move is vital because it helps us not to fall into the trap of objectification and stabilization that previous researchers did fall in when they talked about the product of designing as a stable entity, about design drawings as tools for communication and calculation, about designing as a linear
process, about design methods as producing results and about design knowledge as cognitive knowledge.

The result of drawing together matters of fact cannot be anything else than a matter of fact itself. We have seen in Chapter 3 that simply integrating an existing online community into the practice of the Amsterdam Museum cannot automatically make the museum an online and offline meeting place. The Amsterdam Museum would simply be a museum with an online community. And this is not interesting because it tells us nothing of the dilemmas of incorporating an online community in the museum practice in the first place, about the trouble of creating a sustainable online interactive place or about how the museum needs to change internally to accommodate the online community as part of its practice.

The outcome of drawing together matters of concern is a matter of concern itself. Developing an online community for the Amsterdam Museum and implementing it in the museum’s practice is riddled with debates about how to create interactive spaces and how to integrate the two spheres into an online and offline meeting place. And this is very interesting because it tells us a lot about all the work that needs to be done to welcome people online and offline, all the uncertainties museum employees have of whether people would participate, and if they do participate what that would mean for the ways in which the museum functions, prepares exhibitions, and for the role the museum has in the local community and the national and international museum world.

Designing by drawing things together therefore, is a matter of destabilizing existing practices, of raising actors from their comfortable seats, of setting them in motion and bringing them together in a new arrangement. What that new arrangement would be, how it would look like and how it would work, is still uncertain. Designers embrace this uncertainty as an inherent part of their work (Cross 2011). We have seen in the previous chapter how in designing for the emergent online community The Heart, web designers and museum employees considered it necessary to redefine their roles from clients and contractors to design partners. That meant that web designers were no longer in control of their own design processes, that museum employees would take matters into their own hands and that they would share the responsibility for the well-being of the community (which was unthinkable under the previous service level agreement). Such a destabilization of the practice of developing online communities brought with it many discussions and negotiations about how the new roles
could be defined and what they would entail. That the outcome of these negotiations is uncertain, and that the designers embrace this uncertainty as an inherent part of their work was clear in the words of the e-culture department manager we read in the previous chapter:

“That’s really different; we change the formal aspects of the collaboration. And we try, because it’s new so there is not really a practice already, together we travel and make the rules, new rules, we do that on the go, while we are working.”

Similarly, at the Amsterdam Museum, museum employees are expected to engage with the public in a more personal manner than before. For instance, on the online community, they are required to post content and respond to the members’ comments using their own names rather than hiding under the museum logo. They are no longer sending information, but are communicating with the public. That means that their knowledge can be challenged. This plan has unsettled many museum employees who were used to talk to the public as experts, on behalf of the museum. Now they and their ideas are exposed. They are required to be more open to different perspectives and more flexible in the topics that are discussed online, because they are no longer the only discussion starters. Redefining the employees’ roles turned out to be a larger challenge for the museum than at first anticipated. As an employee explained:

“I think that most of my colleagues like it, but it’s also a bit more frightening because it’s much more personal than if you have a formal role and you know what you can and cannot do. Having formal roles is also easier for the museum because you know exactly what the co-workers will do and what they will not do. So this personal interaction is a much more mature way of working together and working with the public but it’s difficult to implement in the museum. It’s not easy to do.”

**Making a product work; making an assemblage work**

In design by drawing, the aim is to create the form and function of a material product which will be built, sold and used (preferably as intended by the designer). Central to design by drawing is the material, the product. The draftsmen are very careful that the product they draw will be feasible, pleasant and easy to use and that it will perform well internally. Consequence
is calculated in terms of performance. Unintended consequences, while acknowledged that they could appear, are preferably minimized through usability tests. This is a laudable practice in designing products or work schedules where control is encouraged. When we go to the train station, we want the ticket machine to perform the tasks we asked it and to give us the ticket with all the needed information printed on it. If the machine does anything that we do not ask, we panic. We want the train driver to drive the train according to the schedule and stop in the stations indicated in the itinerary. If he takes detours, we get annoyed. We want the train to run without problems. If it breaks, we get angry. The examples are endless.

In designing by drawing things together, the aim is to create an assemblage of people and the things they work and live with, in which alternative possibilities for actions are desired and even encouraged. This is central in the Amsterdam Museum project. On the online community, the web designers and museum employees try to facilitate different ways in which interested members can contribute, get in contact with each other and share stories about Amsterdam. Offline, in the museum, they try to create different possibilities for people to participate, be it in exhibitions by contributing stories, in neighborhood events by talking to the museum employees or in crowd funding activities by donating money. Consequence matters for the museum employees and that is visible in the uncertainties they have: would people participate, would they like to participate, would sharing stories bring them closer to their city, would exhibitions with public stories make our museum more open towards the local community?

As consequence matters, the designers’ interest shifts from what would make a product work to what would make the emerging assemblage work. Creating alternative possibilities for action implies that many things need to be left open, that it becomes a matter of facilitating instead of dictating. Examples abound, such as allowing the public to participate online and offline as they seem comfortable doing: by posting stories, volunteering in the museum, donating money or simply visiting. Things are left open also in the collaboration between museum employees and web designers, for instance, they do not set in advance how many hours a web designer or a museum employee will spend on hosting the online community. Things are left open in preparing exhibitions too, in that an exhibition is planned based on expected contributions from the public instead of an existing collection of objects that can be brought in at any time.
On Design as Liberal Art: The Art of Advancements

Yet, leaving things open does not mean that there is no plan and that everything goes. On the contrary, throughout all the design meetings that were organized, all the debates and discussions that took place, it became clear that the designers at the Amsterdam Museum have a well-developed dream of what they want to achieve. They have a program of action (Latour 1994, Nickelson and Binder 2008) that includes their desired goals, their intentions as well as their beliefs of what would make the emerging assemblage - the museum as an online and offline meeting place work. Following Buchanan (1992: 8), I referred to this program of action in the Introduction of the thesis as “the plan, project or working hypotheses”. The elements of this program of action, or its working hypotheses, emerged across the chapters of this thesis. They represent the mini-theories of design that the designers engaged in the Amsterdam Museum project developed and negotiated together in practice. As for the museum employees and their collaborators designing is like travelling, this program of action can be seen as an itinerary for designing, for drawing things together and making them work. In Table 1 below, the elements of this program of action, of the design itinerary are outlined.

Table 1: The program of action and its working hypotheses in the Amsterdam Museum project.

<table>
<thead>
<tr>
<th>Points of departure</th>
<th>Things needed for the journey</th>
<th>Desired destinations</th>
<th>Mini-theories, stories told during the journey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create an environment where people feel at ease to share</td>
<td>Equality: working like partners</td>
<td>A participative museum practice</td>
<td>If you treat people like equal partners, they will not be afraid to bring their contributions and to participate.</td>
</tr>
<tr>
<td>Allow objects to load with stories and to unfold</td>
<td>Objects are always also epistemic objects: dynamic objects tie us together</td>
<td>An authentic museum practice</td>
<td>If you encourage the public to add their stories to the objects in the collection, the museum will unfold into an authentic storyteller.</td>
</tr>
<tr>
<td>Allow people to chose their own courses of actions and their own objects to tell their story</td>
<td>Trust and empathy: being a host</td>
<td>A self-organizing museum practice</td>
<td>If you facilitate that people can create their own projects online and offline, they will feel more confident to self-organize and be creative.</td>
</tr>
<tr>
<td>Keep possibilities open and understand that things can always be different</td>
<td>Embracing uncertainty: working like pioneers</td>
<td>A serendipitous museum practice</td>
<td>If you are not afraid to stop controlling and telling people what to do, beautiful things can happen.</td>
</tr>
</tbody>
</table>
These working hypotheses have guided the design work of the museum employees and their collaborators across the entire project of transforming the museum into an online and offline meeting place. They were visible in the employees’ collaboration with web designers, and in redefining the relationship among museum employees and between them and the members of the public. They were visible in how interactive exhibitions were approached and prepared, like Johan and I, in how the online community The Heart was approached, developed and hosted, in how neighborhood events or crowd funding activities were organized. They illustrate a designing without a product in that they put forward the worldview of a “shared imaginative living” (Jones 1980: xxxiv), in which people and objects can unfold together in unexpected and hopefully enriching assemblages.

Conclusions

In this chapter, I examined the nature of the acts of designing in designing products and in designing without a product. I illustrated how design by drawing, despite its great importance and usefulness in designing products, cannot be fully reconciled with designing without a product. I argued, following Latour (2008) that at the heart of this challenge lays the difference between two grand narratives about the designers’ relationship to the world. One, seen in design by drawing, is that of mastery, detachment, control and problem solving. The other, seen in design by drawing things together, is that of empathy, attachment, care and advancements.

I elaborated in this chapter on the distinction between matters of fact and matters of concern. I illustrated how designing products is centred on matters of fact. Designing without a product is riddled with matters of concern, with things that are disputed, emerging and that can be other than they are. This underlies the argument that the subject matter of contemporary designing is indeterminate (Buchanan 1992, 1995). It cannot be drawn, stabilized in dessins, in representations. In dealing with matters of concern, with indeterminate matters, designers engage in drawing things together. Drawing things together, as dasein, is a matter of destabilization, of bringing things together, of setting things in motion in an emerging assemblage towards a desired goal which in itself can move or shift as well. In drawing things together, the aim is not to make a product work, but to make the emerging assemblage work.
In advancing assemblages towards a desired and potentially shifting goal, designers’ work is guided by a number of hypotheses they negotiate in practice about what they think would make their design work. These hypotheses are not fixed rules; they are working mini-theories of a ‘shared imaginative living’ (Jones 1980) in which people and things can unfold and enrich together.

In the Conclusions of the thesis, I will draw together the lessons I learned in exploring these four uncertainties about the nature of designing without a product. Based on these lessons I will engage in the project of reassembling design not as a mechanical art of design problem solving, but as a liberal art, an art of advancements. This in itself is a matter of great concern, because it brings designing very close to politics.