CO-DESIGNING
DIGITAL MUSEUM COMMUNICATION

AN EXPLORATION OF DIGITAL MUSEUM COMMUNICATION AS IT EMERGES
IN COLLABORATIVE DESIGN INTERACTION BETWEEN
MUSEUM STAFF AND DIGITAL DESIGNERS

ANNE RØRBÆK OLESEN

Co-Designing Digital Museum Communication

An exploration of digital museum communication as it emerges in collaborative design interaction between museum staff and digital designers

Anne Rørbæk Olesen

OVERVIEW OF CONTENTS

CONTENTS

LIST OF FIGURES

If time has to end, it can be described,
instant by instant, Mr. Palomar thinks,
and each instant, when described,
expands so that its end can no longer be seen.

(Calvino, 1985, p. 164)

PREFACE

Not long ago, I turned 30. In the weeks before and after my birthday, my colleagues, friends and family continuously asked me questions about how it felt and whether I had so far achieved what I wanted in life. At the same time, they would often neglect the importance of turning 30 by stating that 'you still look young' and '30 is only one more little step'. Naturally, all this talk about turning 30 made me reflect quite a lot about my age. I started thinking about who I was when I was 20 and how I pictured myself as 30. Unsurprisingly, I had pictured something completely different. Not that I didn't like the way time had altered my ideas and my imagination, but it was unforeseen.

Time has a way of acting unexpectedly. It is a tricky element, not easily understood and controlled in all its infinity and endless expansion, as is so beautifully expressed by Italo Calvino in his novel about Mr. Palomar (see the previous page). Indeed, I have faced this trickiness in the past three years where time has been both the locus and the limit of my PhD work. Thus, I have done my best to understand and describe time in terms of what happened in the cases I followed, and I have done my best to control the time I had to get that done. In both regards, time, of course, expanded. Unexpected things happened, and the result is as unforeseen for me as it is to picture myself as a 40-year old.

I dedicate this thesis to time and to those who have, over time, helped me develop the thesis and those who will develop it further in the future by spending their time reading it (if any). In terms of developing it, I particularly wish to express my gratitude to my great colleagues at DREAM (Danish Research Centre on Education and Advanced Media Materials), CBIT (Department of Communication, Business and Information Technologies, Roskilde University) and the CSC Laboratory (Computer Supported Collaboration Laboratory, Department of Human Centered Design and Engineering, University of Washington). The communities in which I have participated with you have been very rewarding, both socially and professionally.

I am also extremely grateful to all the participants in the cases I followed, especially the two project managers who, due to anonymisation, I cannot name here. To all of you, thank you for courageously displaying and reflecting upon your everyday activities, challenges and conflicts.

A special thanks goes to my supervisor, Kim Christian Schrøder, and my co-supervisors, Erik Kristiansen and Stine Willum Adrian – Erik, for helping me give form to the project in the beginning; Stine, for helping me reflect on and expand my understanding so much in the end; Kim, for helping me from day one with everything from getting rid of embarrassing typos and far-out metaphors to supporting my ideas and guiding my work in such an elegant way. To all of you, I am very grateful for your always timely and constructive feedback and for excellently showing me different ways of being a good researcher.

Last but not least, no expression of gratitude would be complete without mentioning my friends, my family and my partner, Bo Blaksteen. Thanks for believing in me, for helping me make difficult choices, for giving me other things to think about and for giving me time when I needed it.

ABSTRACT

In a recent newspaper article by culture journalist Anne Bech-Danielsen (2014), grave disappointment is expressed about the state of digital museum communication in Denmark. The article concludes that Danish museums lack knowledge about how to approach the development of digital museum communication – a conclusion previously drawn by a number of Danish museum researchers. Similarly, there is only a very small amount of theoretically informed research, nationally and internationally, exploring the practical organisational issues associated with developing digital museum communication.

The aim of this thesis is to narrow the knowledge gap by exploring how digital museum communication emerges in collaborative design interaction between museum staff and digital designers. To do so, the thesis presents, analyses and interprets data material constructed using ethnographic methods to follow collaborative design interaction for more than 1.5 years in two Danish cases, at an art museum and at a cultural heritage museum. This material is further complemented by a small number of interviews from other supplementary cases.

The thesis contributes with visualisations, conclusions and suggestions in relation to the involvement of digital designers, the understanding of digital museum communication and the negotiation and co-design of digital museum communication in collaborative design processes. Overall, the thesis stresses the importance of focusing on process over product when developing digital museum communication. To sustain this conclusion, funding bodies supporting digital museum communication are encouraged to grant money on the basis of process rather than product specifications and to increasingly support deep levels of co-design. In a similar vein, it is suggested that to avoid a simplistic treatment and understanding of digital museum communication, museum research should direct more attention to how digital museum communication is practically produced behind the scenes of museums.

In addition to these museum-oriented contributions, the thesis adds to methodology by proposing and exemplifying expansions to the visual mapping techniques that are central to the analytical approach of 'situational analysis' (Clarke, 2005). Thus, a 'temporal situational analysis' is suggested, pushing situational analysis to more fully engage with emergence

and temporal complexity. Also, the thesis contributes theoretically by visually adapting Bakhtin's (1981) notions of 'centripetal forces' and 'centrifugal forces' to interpret positional emergence and by expanding on theory of 'boundary negotiating artifacts' (Lee, 2004) and 'boundary objects' (Star & Griesemer, 1989).

ABSTRACT IN DANISH

I en nylig avisartikel skrevet af kulturjournalist Anne Bech-Danielsen (2014) bliver der udtrykt alvorlig skuffelse over den digitale museumsformidling i Danmark. Artiklen konkluderer, at danske museer mangler viden om, hvordan man udvikler digital museumsformidling – en konklusion der også tidligere har været fremsat af danske museumsforskere. Der er ligeledes kun en meget lille mængde forskning, både nationalt og internationalt, der udforsker sådanne praktiske og organisatoriske udfordringer i forhold til at udvikle digital museumsformidling.

Formålet med denne afhandling er at mindske dette videnshul ved at udforske, hvordan digital museumsformidling skabes i kollaborativ designinteraktion mellem ansatte på museer og digitale designere. Dette gøres ved at præsentere, analysere og fortolke datamateriale konstrueret ved at følge kollaborativ designinteraktion etnografisk i over 1,5 år i to danske cases, på et kunstmuseum og et kulturhistorisk museum. Dette materiale er endvidere komplementeret af en lille mængde interviews fra andre, supplerende cases.

Afhandlingen bidrager med visualiseringer, konklusioner og forslag i relation til hvordan digitale designere involveres, hvordan digital museumsformidling forstås og hvordan digital museumsformidling forhandles og co-designes i kollaborative designprocesser. Overordnet set understreger afhandlingen vigtigheden af at fokusere på proces fremfor produkt, når man udvikler digital museumsformidling. For at understøtte denne konklusion opfordres fonde, der finansierer digital museumsformidling til at give bevillinger på baggrund af proces- frem for produktspecifikationer og til i højere grad at støtte dybere former for co-design. På lignende måde foreslås det, for at undgå en simplistisk behandling og forståelse af digital museumsformidling, at museumsforskningen retter mere opmærksom mod, hvordan digital museumsformidling praktisk set bliver udviklet bag scenen på museer.

Udover disse museumsspecifikke bidrag foreslår og eksemplificerer afhandlingen udvidelser af de visuelle kortlægningsteknikker i analysetilgangen 'situational analysis' (Clarke, 2005). Således foreslås der en 'temporal situational analysis', der udvider situational analysis til i højere grad at engagere sig med emergens og tidslig kompleksitet. Endvidere bidrager afhandlingen teoretisk ved visuelt at adaptere Bakhtins (1981)

begreber 'centripetal forces' og 'centrifugal forces' til at udforske positionel emergens og ved at udvikle teori om 'boundary negotiating artifacts' (Lee, 2004) og 'boundary objects' (Star & Griesemer, 1989).

1

INTRODUCTION

> Everybody would like to enjoy visiting a museum and have a
> good experience. But there has been some kind of change in
> society so that not very many people actually find it interesting
> to see a traditional museum exhibition. So it's immensely
> interesting to be part of exploring this area and to find out how
> we can generate exciting cultural communication through the
> museum exhibition in itself and then also through digital means.
>
> (Benjamin, creative director in a digital design company)

I nod excitedly while Benjamin, a creative director, talks about his vision for
museum communication. For years, I have been pondering the subject, and
I too have a belief that digital means can alter the museum experience.
Having followed, for more than one year, the work of Benjamin and his
partners on designing digital museum communication, I know however that
reaching the goal is not an easy task. It is indeed, as Benjamin says, an area
for exploration.

My aim in the present thesis is to contribute to this exploration by focusing
on an issue that has been almost entirely neglected in existing research,
namely, how digital museum communication emerges in collaborative
design interaction between museum staff and digital designers. In this
introduction, I sketch current Danish debates on digital museum
communication and my motivation for concentrating on the complex
emergence of digital museum communication. I then present the research
questions and foci guiding the study, the approaches and contributions of
the study and the structure of the thesis.

1.1. DIGITAL MUSEUM COMMUNICATION: DISAPPOINTING OR DISTURBING?

Two recent newspaper articles present an excellent illustration of different positions within the Danish public debate about digital museum communication. In one article, published by culture journalist Anne Bech-Danielsen (2014, October 31), Danish museums are portrayed as 'fumbling' when it comes to digital museum communication:

> Danish museums and tourist attractions are falling completely behind in terms of modern digital development. The dusty impression of showcases and posters filled with text is the reality in many places, and when digital communication has been prioritised, it often takes the shape of a computer with a mouse pad or an app that nobody downloads. (Bech-Danielsen, 2014, my translation from Danish)

The use of such harsh language should be seen in light of a context in which digital museum communication and the digitalisation of culture have been increasingly politically prioritised in the last decades (Lund, 2009; Rudloff, 2013). Especially since 2006, when digital museum communication took up an entire chapter in the political publication *Udredning om museernes formidling*[1] (Danish Ministry of Culture, 2006), this topic has been on the agenda of the Danish Ministry of Culture. As argued by museum researcher Maja Rudloff (2013), digital communication has primarily been conceptualised as something positive in the discourse of the Danish Ministry of Culture where it relates to qualities such as interactivity, play, fun, re-enactment and participation. Similar to other service and experience industries, the digital has been heralded as a potential resource in the 'fight for attention' in an experience economy society where 'experiences are becoming more and more significant in relation to our identity formation, everyday life and consumption' (Skot-Hansen, 2009, p. 44, my translation from Danish, see also: Bille & Lorenzen, 2008; Danish Business Authority & Center for Cultural and Experience Economy, 2011; Rambøll Management, 2005; Skot-Hansen, 2008, 2009). The disappointment expressed in the article by Bech-Danielsen is thus not surprising due to the great expectations revolving around the digital. However, the conclusion of the article is optimistic, citing Eva Bjerrum, Head of Research and Innovation at The Alexandra Institute, a non-profit company working with digital innovation:

> Digital communication is not necessarily the answer to all problems, Eva Bjerrum states. But used in the right way, many digital solutions can provide a more playful approach: 'Many museums actually want to get started. They

---

[1] The publication focused on museum communication in Denmark.

are fumbling and do not believe they can do it, but they can. They just need some help getting started', says Eva Bjerrum. (Bech-Danielsen, 2014, my translation from Danish)

The other article, published approximately one month after the first, is an interview with Thorbjørn Wulf, the system administrator at the National Gallery of Denmark (Sefland, 2014). His view on digital communication is in stark contrast to that expressed in the first article:

> The more we enclose an artwork in information and canonised art history analysis, the more we exclude the possibility of a different immediacy in the experience of it. We lose the ability to experience on levels other than the directly informative level. And that is a shame. I am afraid that we only become capable of experiencing when an iPad tells us what to experience. (Sefland, 2014, my translation from Danish)

In this article, museum communication is conceptualised as a threatening disturbance to our individual art experience, especially digital museum communication – representing the culmination of a frightening tendency to direct the attention of museum users away from actual museum objects. Similar fears for a digital conquest of museum spaces have influenced the debate by criticising the digital for leading to experience economic show pedagogy and commercial 'disneyfication' (Lund, 2009, p. 36). Such views manifest a pessimistic, technophobe position on digital museum communication that contrasts the more optimistic, technophile, yet disappointed position presented in Bech-Danielsen (2014). In both cases, digitality in its present state is critiqued – either for being disturbing or disappointing.

1.2. MOVING BEHIND THE DIGITAL: MOTIVATION AND RESEARCH QUESTIONS

While I do find it important to debate the state and role of digital museum communication in general, like in the two examples presented above, I seek to move beyond, or more precisely, behind, judging digital museum communication per se. Instead, my interest lies in how digital museum communication is practiced, not what it is or what it can do. As implied at the beginning of the introduction, I see the digital as providing many possibilities for museum communication. However, these possibilities are not inherently good or easily cultivated. Thus, my claim is that much more attention should be given to the practical complexities of producing digital museum communication. Therefore, we need to go behind the digital and

explore more carefully not digital products and solutions in themselves but how they emerge.

I am not the first to put forth such claims in the history of museum research. As anthropologists Richard Handler and Eric Gable, for instance, have argued in reference to museum research in general:

> ...there has been almost no ethnographic inquiry into museums as arenas of ongoing, organized activities. As a result, most research on museums has proceeded by ignoring much of what happens in them. (Handler & Gable, 1997, pp. 8-9)

Today, the same statement can more or less be made regarding digital museum communication. To use the words of cultural anthropologist Sharon Macdonald (2002), my aim is therefore to move 'behind the scenes'[2] of digital museum communication to explore how it emerges, focusing on collaborative design interaction between central actors, namely, museum staff and digital designers. The research is thus guided by the following question:

> How does digital museum communication emerge in collaborative design interaction between museum staff and digital designers?

To make this question more concrete, I have further developed three sub-research questions that guide the analysis and the structure of the thesis:

1. How are digital designers involved in these collaborative design processes?
2. How is digital museum communication understood in these collaborative design processes?
3. How is digital museum communication negotiated and co-designed across boundaries in these collaborative design processes?

Before we proceed, a short explanation of the main concepts and foci is helpful to clarify the questions and my intentions.

Digital museum communication could emcompass mobile apps, touch screens, social media campaigns, augmented reality, 3D glasses and so on. I do not wish to concretely specify hardware or software other than to say that I am interested in how digital technology is designed for, and in the context of, museum communication. In the following chapter (Chapter 2), I delve deeper into this definition of digital museum communication.

---

[2] A book by Macdonald (2002) is called *Behind the Scenes at the Science Museum*. This terminology is also used by others, e.g. Duncan Grewcock (2014) who encourages an approach to relational research that moves 'before and beoynd the museum; a more-than-museum-studies' (p. 6).

In Chapter 2, I also return to defining collaborative design. Here, however, it is important to point to the manner in which the expression *collaborative design interaction* considerably narrows the scope of the research. I use the term 'design' because I am interested in the early phases of developing digital museum communication, namely, the design phase and not the actual construction of the design (Löwgreen & Stolterman, 2007). To quote design researchers Jonas Löwgreen and Erik Stolterman (2007), the design phase is where the designer 'gets involved in design work, establishes a preliminary understanding of the situation, navigates through available information, and initiates all necessary relationships with clients, users, decision makers, and so forth' (p. 15). In this phase, the main ideas and concepts are produced and I want to explore more particularly how this is done collaboratively by looking at the interaction between central actors, namely, museum staff and digital designers.

But who are these central actors? I define *museum staff* as different groups employed in museums. In the thesis, a wide array of museum staff groups play a role, such as: educators, curators, researchers, front staff, guards, marketing and communication staff, exhibition designers, managers and archaeologists. In the Danish context, *digital designers* are rarely employed in museums, and developing digital museum communication is a growing niche for creative industries working in the digital field (Skot-Hansen, 2008, 2009). Thus, I perceive a digital designer as a designer or similar professional with specific expertise in designing digital communication who is *not* employed at a museum.

Lastly, I want to address the centrality of the term *emergence*. The concept of emergence recognises that the novel is constantly happening (Mead, 1962, p. 198), and using it thus signals my interest in this temporal, complex process. In practice, four elements have proven to be particularly valuable as foci in trying to track the emergence of digital museum communication in collaborative design interaction. These elements are manifested in the three sub-research questions as conceptual anchor points, namely, *involving* designers (question 1), *understanding* digital museum communication (question 2) and *negotiating and co-designing* digital museum communication (question 3). Thus, the emergence of digital museum communication is heavily intertwined with what happens in practice in terms of involving, understanding, negotiating and co-designing. This relation is of course very complex and cannot be fully pinned down, but through visualisations, analyses and interpretations, my intention is to showcase and understand, to some extent, the emergence of digital museum communication.

1.3. PRACTICE, METHODS AND THEORY: APPROACHES AND CONTRIBUTIONS

By asking the above-mentioned research questions, I first and foremost seek to add to the *practice* of designing digital museum communication. As pointed out by Bech-Danielsen (2014), there is a lack of knowledge about how to approach the development of digital museum communication at museums. Danish museum researchers have previously drawn similar conclusions (e.g., Holdgaard, 2014; Holdgaard & Simonsen, 2011; Løssing, 2008; Skot-Hansen, 2008, 2009). Nevertheless, there is still only a very small number of theoretically informed studies both nationally and internationally exploring the practical organisational issues associated with developing digital museum communication.

The *methods* used to further explore these issues are of an exploratory, ethnographic and sociological nature. The data material is constructed by ethnographically following collaborative design interaction for more than 1.5 years in two very dissimilar cases. One of the cases takes place at an art museum (called the Art Case); the other case takes place at a cultural heritage museum (called the Cultural Heritage Case). Furthermore, I compare some of my conclusions from these two primary cases with interview data from a small set of supplementary cases. To analyse and present the data, I use the analytical approach of situational analysis (Clarke, 2003; Clarke, 2005). Situational analysis is a development of grounded theory that prescribes the making of visual maps of the situation under study throughout the research process in order to support a systematic qualitative analysis and presentation. The main methodological contribution of the thesis is my expansion of these mapping techniques. Thus, I adapt situational analysis in a manner that better suits process analysis and the exploration of emergence and temporal complexity. In the methods chapter, I demonstrate how such a temporal situational analysis can be performed. The analysis chapters further exemplify how it can be used for presentational purposes.

Theoretically, I supplement museum research with perspectives from the broader areas of communication, design and organisation research, particularly informed by a symbolic interactionist approach to science and technology studies (STS). I work in a constructivist and cross-disciplinary manner, which is as rewarding as it is challenging – rewarding because it affords theoretical innovation in the border zones between disciplines (Bakhtin, 1986, pp. 136-137); challenging because it is difficult to get an overview at this level of research diversity. Therefore, I focus quite narrowly on some issues within the theoretical disciplines. In the disciplinary

crossings, I most notably contribute with new perspectives on how to study positional and artifactual emergence in design processes and with new perspectives on the theory of boundary objects (Star & Griesemer, 1989) and boundary negotiating artifacts (Lee, 2004). In the latter regard, I propose a new type of artifact, namely, 'reifying symbolic artifacts'.

1.4. STRUCTURE OF THE THESIS

The thesis consists of six chapters, including the current brief introduction. In this first chapter, *Chapter 1*, I have sketched different positions in current debates on digital museum communication in the Danish context. I have further illuminated the motivation, the research questions and foci guiding the study as well as the approaches and contributions of the thesis.

Following this outline of the thesis structure, *Chapter 2* continues with a presentation of literature and theory of relevance for the thesis. In this chapter, I define central concepts, namely, digital museum communication and collaborative design, and I show how they have been described and discussed in the museum literature. I further position my work in relation to both museum studies and broader scientific traditions. Lastly, I introduce theoretical perspectives and concepts useful for exploring the issues outlined more thoroughly than has been done to date.

In *Chapter 3*, I explain the many methodological choices taken in the course of doing the research. I sketch the mind-set guiding the research and explicate the more concrete circumstances in relation to planning the research and generating and analysing the data. Lastly, I reflect upon particularly relevant dangers and limitations of the research.

Chapter 4 and Chapter 5 together comprise the analysis. Chapter 4 answers sub-research questions one and two and thus focuses on the involvement of digital designers and the understanding of digital museum communication by analysing data from both the primary and supplementary cases. Chapter 5 answers sub-research question three by zooming in on how digital museum communication is negotiated and co-designed in one of the primary cases, the Art Case. This division is further explained in the methods chapter.

Finally, *Chapter 6* summarises the conclusions from a move behind the digital and presents an overview of the research contributions and suggestions.

2

LITERATURE AND THEORY

The research focus should be clear at this point even though perhaps only in a superficial manner. The aim of this section is to deepen the understanding of the focus, as well as its significance, by outlining relevant literature and theory. Thus, the intention is to create 'a firm foundation for advancing knowledge' (Webster & Watson, 2002, p. xiii).

Even though my intention is indeed to establish a firm foundation, it is not to be considered as exhaustive or comprehensive. What follows is my attempt at constructing a meaningful narrative across a wide range of disciplines and perspectives. This narrative is based on a collection of books and articles gathered from the day I started working on the research project. Like a squirrel collecting and storing nuts for wintertime, I have been harvesting texts from conferences, seminars and courses, texts found in journals and databases and texts given to me by others in the belief that they had relevance to my work. While some of these texts thus came to me, I also actively sought them by looking through and/or searching in journals and databases that I found particularly relevant.[3] When the time was right, I immersed myself in the collection, and I expanded it by following interesting leads, concepts or references to other texts.

The structure of the presentation of all of this material is threefold. In the first section, I specify what I mean by digital museum communication and relate the concept to broader discussions about technology. I point to different ways of understanding technology and highlight a tendency to sometimes slide towards simplistic treatments of technology in the museum literature and Danish cultural policy discourse. Based on this argument, I position my work within a practice turn in museum studies, having an interest in exploring the complexities of museum practice behind the scenes,

---

[3] In relation to the museum literature, I looked through and/or searched in journals that I found particularly relevant for my research. For instance, these include *Museum Management and Curatorship*, *Museum and Society*, *Curator: The Museum Journal*, *Museum International* and *Nordisk Museologi* (Nordic Museology).

more particularly, collaborative design interaction between museum staff and digital designers.

In the second section, I define collaborative design and show how it has been described and discussed in the museum literature, zooming in on publications that consider external collaborators, such as digital designers. This literature has focused particularly on three areas, thus paralleling the three sub-research questions, namely, 1) the *involvement* of external collaborators, 2) the *understanding* of digital technology and 3) communicating across boundaries. The third area has been researched with greater theoretical and methodological rigour in terms of collaborative design between museum staff internally at museums, particularly in relation to how exhibitions are *negotiated and co-designed across boundaries*. Conclusions from this work are further presented to supplement the limited knowledge on the issue in relation to developing digital museum communication.

In the third section, the scope is expanded to account for my symbolic interactionist positioning within the broader field of STS. Particularly, I present sociologist Adele Clarke's (2003; 2005) recent development of grounded theory into situational analysis which forms a central framework for my analysis. In this presentation, I explain how I use situational analysis to explore the foci mentioned in the second section (summed up as involvement, understanding, negotiation and co-design). Further, I supplement this framework due to my interest in emergence and temporal complexity. While I explain what this supplement entails methodologically in the methods chapter (Chapter 3), I introduce my theoretical inspiration and selected theoretical concepts useful for exploring emergence and temporal complexity in the present chapter.

2.1. TECHNOLOGY AND MUSEUMS

Until now, I have faithfully used the term 'digital museum communication', only occasionally using instead 'the digital'. However, the phenomenon I am interested in could be termed in many ways. Researchers in the museum field have used other signifiers, for instance, information and communication technology (Drotner & Laursen, 2011; Kéfi & Pallud, 2011; Parry, 2013; Parry & Sawyer, 2005; Peacock, 2008; Pujol-Tost, 2011); digital technology (Din & Hecht, 2007; Drotner & Laursen, 2011; Smørdal, Stuedahl, & Sem, 2014); new media (Henning, 2011); digital media (Din & Hecht, 2007; Kalay, 2008; Marty & Parry, 2008; Parry, 2013; Parry & Sawyer, 2005); digital media and technologies (Holdgaard, 2014; Holdgaard

& Simonsen, 2011); computer technology (Jones-Garmil, 1997) and so on. Similarly, different names have been used to signify the broader museum research field interested in digital phenomena, such as cybermuseology (Dietz, 1998; Larsen, Gade, & Hansen, 2015; Løssing, 2008); digital museology (Hafsteinsson & Larsen, 2011; Rudloff, 2013); museum computing (Parry, 2005); digital heritage (Marty & Parry, 2008; Parry, 2007; Parry, 2010); digital cultural heritage (Cameron & Kenderdine, 2007a) etc. While these names might have different implications, they all point to a broad interest in the interrelation between museums, cultural heritage and digital phenomena.

I permit myself to use different terms for this interest, similar to other researchers mentioned in the above enumeration. However, I primarily use the term 'digital museum communication' for one reason: by using 'digital museum communication', I refer to the *purpose* of communicating rather than the *object* itself. I have experienced that the use of expressions like digital technology or ICT entails a risk of being classified as someone concerned with a particular machine or technology as a computational tool. On the contrary, I am interested in the way people conceptualise and negotiate the digital in light of its communicative purpose and features in a museum context. Such different interests in digital or technological phenomena have been discussed outside the museum field. In the next sections, I present different arguments from these discussions in order to scrutinise how the digital has been conceptualised in the museum field.

2.1.1. Conceptualisations of technology outside the museum field

In the general introduction to the book *The Social Construction of Technological Systems*, STS scholars Wiebe Bijker, Thomas Hughes and Trevor Pinch (1987) narrate their collaborative efforts in pursuing a sociology of technology in the early 1980s. Discussions over pink champagne at an Austrian cocktail session and over dinner in a French restaurant allegedly resulted in a workshop and the above-mentioned book, thus arousing 'a generally emerging interest in a new type of technology study' (Bijker, Hughes, & Pinch, 1987, p. 3). The three editors define this new type of technology study as being concerned with looking into 'the black box of technology' (Bijker, Hughes, & Pinch, 1987, p. 5), whether done in relation to a social constructivist approach (Pinch & Bijker, 1987), a systems approach (Hughes, 1987) or an actor network approach (Callon, 1987). Furthermore, they spot a tendency to move away from technological determinism and viewing technology as the result of the individual inventor genius to instead use a metaphor of the 'seamless web' for understanding technology and society (Bijker, Hughes, & Pinch, 1987, p. 3).

A web metaphor is similarly proposed by the two computer/information systems researchers Rob Kling and Walt Scacchi in their 1982 publication 'The web of computing: Computer technology as social organization'. They suggest viewing 'computing developments as complex social objects constrained by their context, infrastructure, and history' (Kling & Scacchi, 1982, p. 69) and critique what they call a 'discrete-entity model of computing' (p. 2). This typical discrete-entity approach to computing is simplistic, they argue, since it largely ignores social life. For instance, they explain how a traffic analyst employing a discrete-entity model believes that he can predict the effects of building a new freeway by mathematical calculation. In contrast, a traffic analyst employing a web model believes he must view the technical change as embedded in a larger social and historical system of activity (Kling & Scacchi, 1982, pp. 3-4).

Both publications mentioned above exemplify the desire to depart from narrow and deterministic views on technology within computer/information systems research as well as the broader field of STS in the early 1980s. This desire may have departed in a growing complexity surrounding the concept of technology. For instance, as described by technology philosopher Langdon Winner, if we go back a few more years in time to 1977, the situation was indeed pressing:

> ...discussions of the political implications of advanced technology have a tendency to slide into a polarity of good versus evil. Because there is no middle ground for talking about such things, statements often end up being expressions of total affirmation or total denial. One either hates technology or loves it […] It soon becomes clear that in this enlightened age there is almost no middle ground of rational discourse, no available common language with which persons of differing backgrounds can discuss matters of technology in thoughtful, critical terms. Conversations gravitate toward warring polarities and choosing sides. (Winner, 1977, pp. 10-11)

Winner points to a kind of technological determinism anchored in technophilia versus technophobia, in loving technology versus hating or fearing it. In both cases, technology is understood as an external force with special impacts and effects on society, whether good or bad. While these are surely valid concerns (MacKenzie & Wajcman, 1985, p. 2), they represent a limited understanding of an extremely complex phenomenon, as similarly pointed out by others before and after Winner, for instance, historian Rachel Laudan who elegantly introduces *The Nature of Technological Knowledge* from 1984 with the words:

> One of the ironies of our time is the sparsity of useful analytical tools for understanding change and development within technology itself. For all the

diatribes about the disastrous effects of technology on modern life, for all the equally uncritical paeans to technology as the panacea for human ills, the vociferous pro- and anti-technology movements have failed to illuminate the nature of technology […] technology itself remains locked inside an impenetrable black box, a *deus ex machina* to be invoked when all other explanations of puzzling social and economic phenomena fail. (Laudan, 1984, p. 1)

What these quotations signal is a fatigue with idealistic and stereotypical treatments of technology, leading the way for what Bijker, Hughes and Pinch (1987) define as 'a generally emerging interest in a new type of technology study' (p. 3).

Moving forward in time to the 1990s, two information system and organisation researchers Wanda Orlikowski and Jack Baroudi find that the barrier to such a new type of technology study largely rests on narrow philosophical assumptions. They examine 155 information systems research (ISR) articles published from 1983 to 1988 and conclude that the philosophical assumptions about the nature of valid evidence and the phenomena of interest in these articles are based on a natural science tradition. These assumptions favour positivist explanation and prediction of external reality and are inappropriate for understanding 'the ongoing interactions among people, information technology and organizations, as these are situated historically and contextually' (Orlikowski & Baroudi, 1990, p. 2).

Orlikowski stands out as a prominent figure in terms of critiquing the manner in which technology has been and is being studied then and now. Some of her findings and expressions, often co-authored, are worth mentioning to connect the discussions to more recent debates. She combines perspectives from the fields of information technology and organisation studies (e.g., Orlikowski & Barley, 2001) and builds, among other things, on theoretical developments within the STS field, particularly explicating a connection with ANT in recent years (e.g., Orlikowski & Scott, 2008). Approximately a decade after her 1990 study with Baroudi, she, together with social informatics researcher Suzanne Iacono, again conducts a literature review of ISR by examining publications in the journal Information System Research since its inception in 1990. Orlikowski & Iacono (2001) present five views on information technology represented in the publications: the nominal view, the computational view, the tool view, the proxy view and the ensemble view (see their classification in Figure 1).

Table 1   Classification of Articles in *ISR* (1990–1999) by Conceptualization of Information Technology

Cluster	Conceptualization of Technology	Freq.	%	Freq.	%
Nominal View	Absent			44	24.8
Computational View				43	24.3
	Algorithm	6	3.4		
	Model	37	20.9		
Tool View				36	20.3
	Labor Substitution Tool	1	0.5		
	Productivity Tool	12	6.8		
	Information Processing Tool	15	8.5		
	Social Relations Tool	8	4.5		
Proxy View				32	18.1
	Perception	8	4.5		
	Diffusion	8	4.5		
	Capital	16	9.0		
Ensemble View				22	12.5
	Development Project	7	4.0		
	Production Network	2	1.1		
	Embedded System	7	4.0		
	Structure	6	3.4		
Total				177	100%

Figure 1: Conceptualisation of IT in ISR articles (Orlikowski & Iacono, 2001)

In the most common occurrence – the nominal view – technology might be mentioned a couple of times, but it is absent in terms of conceptual and analytical emphasis, posing no description, conceptualisation or theorisation of IT artifacts. In the computational view, taking second place in terms of use frequency, technology is conceptualised as either an algorithm or a model. The interest lies in information technology as a computational power, manifesting a traditional computer science approach where the system and its capacity are in focus without, for instance, regarding its interrelation with complex and dynamic social contexts. Proceeding to the tool view, this view manifests technology as an unchanging, discrete technical entity that impacts and effects information processing, productivity, social relations and labour substitution. The fourth largest cluster is the proxy view where the focus is on a few elements that are assumed to represent the critical aspects of technology, either by focusing on users' perceptions of technology, the diffusion of technology within and across organisations or the monetary value of technology. The risk of such studies is the loss of more elaborate theorising about variations in the role and use of IT artifacts in different contexts and over time due to the focus on one or a few elements that are understood to represent the crucial features of information technology. The fifth and least held view is the ensemble view, which focuses on the dynamic interactions between people and technology. Here, technology is perceived as a socio-technical development

project, as a system embedded in a larger social context, as a social structure or as enmeshed within a network of agents and alliances.

The tendency spotted by Orlikowski & Iacono (2001) is a typical treatment of technology in IS research as either 'absent, black-boxed, abstracted from social life, or reduced to surrogate measures' (p. 130). The result of this is a general conceptualisation of the IT artifact as 'relatively stable, discrete, independent, and fixed' (Orlikowski & Iacono, 2001, p. 122). In contrast, they propose a more multifaceted theorising about IT artifacts that deals with 'the meanings, capabilities, and uses of IT artifacts, their multiple, emergent, and dynamic properties, as well as the recursive transformations occurring in the various social worlds in which they are embedded' (Orlikowski & Iacono, 2001, p. 133). Hence, they call for a better understanding of the evolving dynamics of IT artifacts and argue for a need for more ongoing, longitudinal studies of information technology.

Orlikowski further pursues these arguments in later works, arguing for a socio-material practice approach to technology (e.g., Orlikowski, 2007; Orlikowski & Scott, 2008). In these later works, she explicitly contrasts a techno-centric perspective focusing on technology effects with a human-centred perspective focusing on interactions with technology, arguing that both perspectives are limited and limiting. One ignores sociocultural influences; the other minimises the role of technology itself. As she says: 'there is no social that is not also material and no material that is not also social' (Orlikowski, 2007, p. 1437).

In the above historical tour de force, I have eclectically pointed out different arguments in terms of how technology has been and is conceptualised in research and public discourse. These different conceptualisations can, quite simplistically, be summed up in a continuum model (Figure 2).

Techno-centrism	Human-centrism
Discrete-entity model	Web model
Technology as an independent, external force that effects and impacts	Technology as interdependent or constitutively entangled with the sociocultural context
Determinism: Fixed, simplistic views on technology (technophilia/technophobia)	Constructivism: Flexible, dynamic views on technology
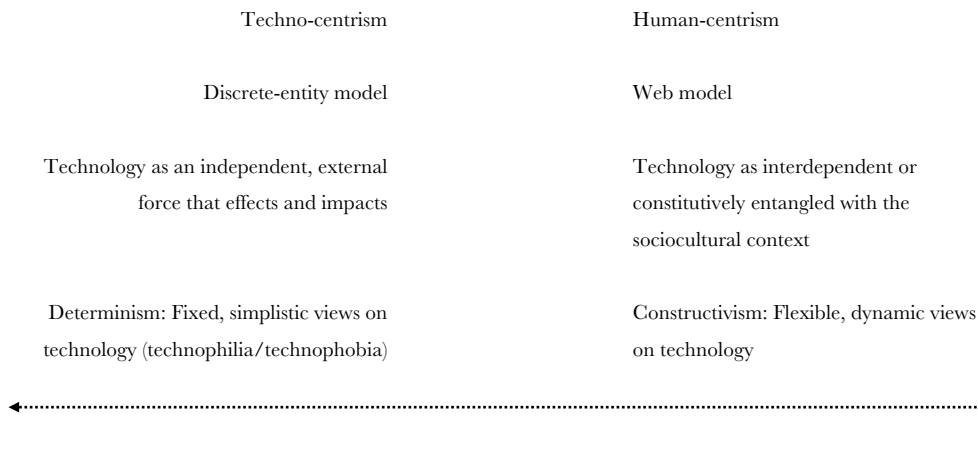
Figure 2: Continuum of technology conceptualisations

The continuum should be read as consisting of two outer poles in which the categories are *not* positioned in terms of how left-leaning or right-leaning they are. Rather, the idea is to be able to distinguish between different broader trends. As Kling and Scacchi (1982) specify in terms of the discrete-entity/web model: 'While one is unlikely to find discrete-entity analysts who completely neglect social context, history, and infrastructure, or web analyses which minutely investigate all aspects of social context, history, and infrastructure, analyses that lean toward either extreme are easy enough to identify' (p. 11).

2.1.2. Conceptualisations of digital technology in the museum literature and cultural policy discourse

Having touched lightly on broader technology discussions, we now return to the research field interested in the interrelations between museums, cultural heritage and digital phenomena. How is technology treated in this field? Initially, it is worth mentioning the diversity in terms of research foci and approaches characterising it, making it a complicated field to grasp. Further, contributions are seldom linked to 'the big picture' and are often not explicit about philosophical assumptions in terms of the nature of technology and the approaches chosen to study it. However, some researchers do mention, more or less explicitly, a positioning that relates directly to the continuum elaborated in the previous section (e.g., Cameron & Kenderdine, 2007b, p. 1; Kéfi & Pallud, 2011, p. 277; Parry, 2007, pp. 4-5; Peacock, 2008, p. 349; Tallon, 2008, p. xxii). Moreover, recent Danish research publications not only mention but critique tendencies in terms of the way technology is treated in the museum research and Danish cultural policy discourse (Holdgaard, 2014; Rudloff, 2013).

As mentioned in the introduction, Rudloff (2013) unravels a tendency to link the digital with positive qualities in Danish cultural policy discourse and partly also in the broader museum literature. This link, she claims, is highly assumed because the actual effect of digital communication in a museum context has not been carefully explored. Examining the cultural policy discourse on museums, Rudloff (2013) concludes that the characterisation of 'the good experience' is often related to digital communication. The digital is further associated with positive qualities, such as interactivity, play, entertainment, re-enactment and participation (Rudloff, 2013, pp. 13-14). Similarly, museum researcher Connie Svabo (2010) asserts that digital media are surrounded by an 'aura of expectation' (p. 28) in Danish cultural policy publications, particularly in terms of their ability to support user-oriented communication. Relating these arguments to the continuum presented in the previous section, the manner in which technology is treated in Danish cultural policy discourse arguably leans to the left of the continuum. Technology is seen as having certain positive effects, independent of the actual context, and is thus treated in a simplistic, techno-centric way.

New media scholar Nanna Holdgaard (2014, pp. 30-31) spots a similar tendency in the museum literature more broadly to treat digital media and technologies as main catalysts having certain positive effects. As Holdgaard writes:

> Many of the optimistic voices are very technology-centered focusing mostly on the technological breakthroughs that enable new interaction forms and disregard the use context of both museums and its users. (Holdgaard, 2014, p. 27)

According to Holdgaard (2014, pp. 30-31), some publications relate the digital to broader changes within the museum institution's role and obligations (e.g., Black, 2005; Drotner, Weber, Larsen, & Løssing, 2011; Lang, Reeve, & Woollard, 2006) while others point to technology as a determining factor of change (e.g., Bowen, 2000; Din & Hecht, 2007; Henning, 2006; Jones-Garmil & Anderson, 1997; Parry, 2007; Russo, 2012; Schweibenz, 2004). Further, she depicts early anthologies in the field as utopian, focusing on possibilities, opportunities and expectations of its impacts (Jones-Garmil & Anderson, 1997; Thomas & Mintz, 1998) while later works such as *Theorizing Digital Cultural Heritage: A Critical Discourse* (Cameron & Kenderdine, 2007a) and *Recoding the Museum* (Parry, 2007) take a step towards overcoming technological determinism or more critically reflecting on the implications of introducing digital technologies into museums (Holdgaard, 2014, pp. 39-40).

Holdgaard (2014, p. 39) further questions a notion related to deterministic views, namely, the presumption that technology is already largely integrated into museum practice (see also Holdgaard & Simonsen (2011) and Waterton (2010)) – an interesting point on which I will dwell a bit further. Indeed, claims or prophesies about the digital as permanent, pervasive, crucially consequential, embedded, integrated, innate, fundamentally affecting, transformative and normative in museums and museum practice are easily found in the museum literature (e.g., Drotner & Schrøder, 2013, p. 1; Giaccardi, 2012b, p. 1; Hermann, 1997, p. 66; Marty & Parry, 2008, p. 307; Parry, 2007, p. 136; Parry, 2013; Parry & Sawyer, 2005; Skot-Hansen 2008, p. 15; Šola, 2010, p. 422). In particular, the highly acclaimed museum researcher, Ross Parry, should be further scrutinised in this regard. For instance, Ross Parry, together with museum researcher Andrew Sawyer, make a central contribution which supports the notion regarding integration in their 2005 evolutionary analysis of the interrelation between museums and ICT (Figure 3).
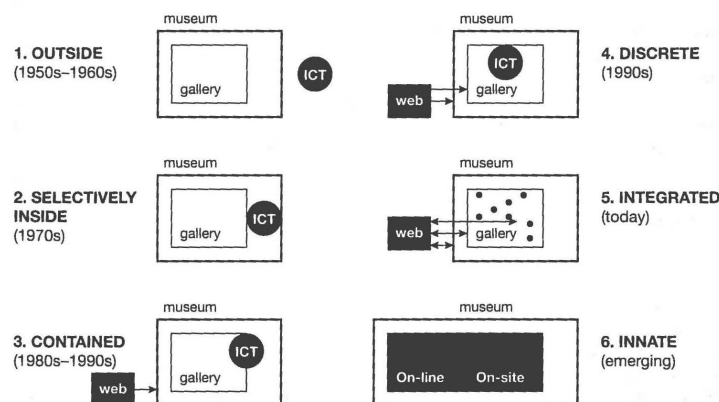
Figure 3: An evolution of in-gallery digital interactivity (Parry & Sawyer, 2005)

In their account, ICT was outside the realm of museums and galleries in the 1950s-1960s. In the 1970s, ICT entered the museum in a peripheral manner as part of collection management and research. ICT stepped into the exhibition space in the 1980s-1990s, but only in a contained manner, usually physically separated from the collections. In the 1990s, ICT was discretely present in the galleries as 'stand-alone' interactive devices. At the same time, the web was increasingly used and explored by museums, not integrated in exhibitions thought. This happened later on in the 2000s (termed as 'today' by Parry & Sawyer) where ICT was physically blended with the rest of the exhibition, and there was dialogue between the on-site and online realms. The last step in the evolution is the phase termed

'innate', an emerging tendency where the exhibition is conceived as a digital medium from the beginning. Here, technology is embedded and pervasive rather than a special feature. Parry and Sawyer (2005) stress that not all exhibitions will be like this, but when deployed successfully, ICT will most likely be embedded and pervasive. As they predict: 'Digital ICT will be used more and more in the space of the museum, but we will just notice it less and less' (Parry & Sawyer, 2005, p. 49). Almost a decade later, Parry follows up on this statement. In a recent publication (Parry, 2013), he suggests that digital media has become normative in museums in what he terms 'the postdigital era'. Today, he claims, the digital has been 'captured' in the organisational language and logics of museums as if it was some kind of external force now under control (Parry, 2013, p. 35).

I see this evolutionary explanation of the historical interrelation between museums and ICT as quite simplistic, especially the recently posed idea about normativity. In particular, I find Parry's generalisation to the entire museum field problematic. Thus, based mainly on interview data and 'documentary evidence' (such as annual reviews, strategy documents and minutes of board meetings, p. 25) from six national museums in the UK, Parry writes:

> This article has attempted to recognize a key moment for museums in their relationship with digital media, and what this means not just for our practice, but also for our research. It is suggested that it is perhaps time, finally, to acknowledge the extent of normative digital media in the museum. [...] Once digital media is no longer 'new technology', we can use a different set of assumptions, a different lexicon of terms, and free ourselves from discursive set pieces around uptake and advocacy. We can be free to reach alternative sets of technological adoption. With digital media normative (naturalized, ambient, and augmented) in the museum, we are now ready to reset our relationship with it. (Parry, 2013, pp. 36-37)

I agree with the notion that we should not regard digital media as 'new technology', paralleling an argument advanced by Orlikowski (2007). But neither should we, on the contrary, position it to be something normative. It may be experienced as such by the senior managers of new media in six British national museums, and it may also be inscribed in their strategies, reviews and reports. But how, I ask, is it actually *practiced* in the everyday interaction at these six museums? How is it practiced in other UK museums? And how is it practiced in museums in other countries? Instead of examining digital ideals that ignore variations in the role, development and use of digital technologies, I propose the exploration of digital technologies as situated in and entangled with everyday practice.

Importantly, I see much of Parry's work as extremely valuable in terms of nuancing the understanding of the interrelation between digital phenomena, cultural heritage and museums. My criticism is exclusively directed at the tendency to sometimes slide into simplistic, deterministic readings in alignment with the left side of the continuum of technology conceptualisations presented earlier, epitomising the more general tendency in the museum literature pointed out previously.

Another relevant example of this is Parry's (2007) seminal book *Recoding the Museum*. Even though Parry states in the introduction that 'Our narrative will work hard not to slide into deterministic readings of technology: that is, readings that see technology such as digital media as an external force exerting change on society' (Parry, 2007, p. 4), I would argue that he slides into precisely such readings several times in the book (see also Patricia Galloway's (2010, p. 212) review of the book). For instance, he does so when he prophesises that 'computers will become a *defining* [emphasis added] (innate) part of what it is to be a museum' (Parry, 2007, p. 136); when he states that 'it is hard not to conclude that *the effect* of digital technology has been *catalytic, significant and lasting* [emphases added]' (Parry, 2007, p. 140); and when he concludes the book with the phrase: 'Under the *influence* [emphasis added] of just another of these new technologies, we have been – and indeed we remain – witnesses to yet another *recoding* of the museum' (Parry, 2007, p. 140). In these phrases, digital technology is seen as defining, effecting and influencing the museum, presenting the museum as passively adapting to the digital recoding, reminiscent of a warning posed by STS researchers Donald Angus MacKenzie and Judy Wacjman:

> If our thinking centres on the effects of technology on society, then we will tend to pose questions like, 'How can society best adapt to changing technology?' We will take technological change as a given, as an independent factor, and think through our social actions as a range of (more or less) passive responses. (MacKenzie & Wajcman, 1985, pp. 2-3)

The problem becomes even more evident in Parry's recount of two stories in the book: a story displaying an essential incompatibility between museums and computers versus a story in which these incompatibilities appear to be resolved, thus signalling a bright future (Parry, 2007, xi). Speaking about the story of incompatibility, Parry states:

> What we learn from this story (I admit, an intentionally astigmatic story) is how beneath the practical and pragmatic issues related to time, money and skills, lie perhaps some more profound discontinuities between how a museum and a computer both function. It is these deeper fault lines, under the surface, well below the rubble and froth of the day-to-day politics of the museum, that perhaps reveal more fundamental reasons as to why museums

and computers have taken two generations to find their 'fit'. (Parry, 2007, p. 138)

I concur with Holdgaard's (2014, p. 28) suggestion that we might need to reconsider this gap between these two stories and take a closer look at their interrelation. In contrast to Parry, I do not believe that there is some mystical, hidden force of discontinuity 'under the surface' and 'well below', imposing on museum practice. Rather, I believe that these discontinuities are entangled *with* museum practice, with the 'rubble and froth of day-to-day politics of the museum' (Parry, 2007, p. 138). We thus need to explore this day-to-day practice more closely to extend our understanding of the interrelation between digital phenomena, cultural heritage and museums.

2.1.3. Positioning within museum studies

A quick sum up of the arguments posed so far in this chapter: Leaning on recent Danish research publications, I have illustrated a tendency to slide towards the left side of the continuum of technology conceptualisations in Danish culture policy discourse and the museum literature more broadly. I have further argued in favour of exploring museum practice more carefully to challenge this tendency. Importantly, this argument should not be seen as a critique per se but, rather, as a positioning of my work within the broader field of museum studies. This positioning thus relates to a more general practice turn in museum studies (Brenna, 2009; Macdonald, 2006).

Macdonald (2006) depicts this practice turn in the introduction to her highly acclaimed anthology *A Companion to Museum Studies*. She bases her depiction on a reference to the research agenda preluded in the 1989 publication *The New Museology* (Vergo, 1989). In this publication, a new kind of museology, the so-called 'new museology', was heralded as a more theoretical and humanistic approach than the old one. The intention was to move away from exploring 'how to' matters to instead – in a more theoretically informed manner – engage with the purposes of museums (Macdonald, 2006, p. 2; Vergo, 1989, p. 3). While these thoughts have been vastly influential in the museum field ever since, Macdonald spots an emerging interest in exploring museum practice and methodological issues, though in a more theoretically and empirically informed manner:

> What we see in museum studies as represented here is a broader range of methods brought to bear and the development of approaches specifically honed to trying to understand the museum. Also characteristic is a renewed commitment to trying to bring together the insights from academic studies with the practical work of museums – to return to some of the 'how to'

concerns of the 'old museology' from a new, more theoretically and empirically informed, basis. (Macdonald, 2006, p. 6)

Zooming in on the area of digital museum communication again, Parry (2005) argues that much of the literature and research on digital museum computing have been 'written largely by museum professionals with a view to best practice and procurement, and it has generally been indisposed to placing new technology within a conspicuous and coherent theoretical context' (p. 338). I seek to add to the exploration of digital practice, yet in both a theoretically and empirically informed manner, as underscored by Macdonald. Particularly, I see a need to explore the complexities of designing digital museum communication behind the scenes of museums, inside the museum organisation (Macdonald, 2001, 2002).

This need relates to a general lack of research on production processes within museums (Grewcock, 2014; Handler & Gable, 1997; Kéfi & Pallud, 2011; Lee, 2004, 2007b; Macdonald, 2002; Peacock, 2008; Yaneva, 2003). History, it seems, is repeating itself. In another book, *Behind the Scenes at the Science Museum* (Macdonald, 2002), Macdonald argues that the majority of analyses of museums has focused on finished exhibitions. To that date, very little research had been concerned with the production of exhibitions taking place behind the scenes at museums. Others before her have alluded to a similar paucity of research (Macdonald (2002), note 11, p. 20), for instance, Handler and Gable (1997) who call for ethnographic research with a focus on:

> ...the museum as a social arena in which many people of differing backgrounds continuously and routinely interact to produce, exchange, and consume messages. Some scholars have attended to aspects of institutional histories and dynamics, but there has been almost no ethnographic inquiry into museums as arenas of ongoing, organized activities. As a result, most research on museums has proceeded by ignoring much of what happens in them. (Handler & Gable, 1997, pp. 8-9)

Today, the same dearth in research applies to the production of digital museum communication. Many influential books on digital phenomena in museums focus primarily on finished products (technological features, possibilities and evaluations), use (use situations and visitor interaction) and broader theoretical implications or discussions (e.g., Cameron & Kenderdine, 2007a; Giaccardi, 2012a; Kalay, Kvan, & Affleck, 2008; Tallon & Walker, 2008). Also, as museum researcher Darren Peacock (2008) notes, much of the literature in the field 'analyses the effects of technology in terms of its effects on interpretive practice, visitor experience, or social engagement, rather than on the organisation itself' (p. 345). Hence, the

preoccupation has primarily been with what happens outside museum organisations and not with what happens in them.

In sum, I position my work within a practice turn in museum studies, thus having an interest in exploring complexities of digital museum practice behind the scenes – more specifically, collaborative design interaction between museum staff and digital designers. In the next sections, I unravel what I mean by the expression 'collaborative design' and I present relevant conclusions from the existing, though limited, museum literature on the subject.

2.2. COLLABORATIVE DESIGN AND MUSEUMS

2.2.1. Defining collaborative design

> 'Designing' is as elusive a word as 'technology'. Its meaning shifts with speaker, listener and with context. Scholar, manager, engineer or artist, each with different interests and motive, sees designing in a different way. Ranges of view, depths of field and primary foci differ. (Bucciarelli, 1988, p. 159)

I use the term 'collaborative design' to signal a particular understanding of design as well as a specific interest in design phenomena. The purpose of the present section is to clarify exactly what this means, starting with a definition of design.

Design is relevant for and has been explored in many disciplines (Bratteteig, 2007; Simonsen, Bærenholdt, Büscher, & Scheuer, 2010), making it a complex phenomenon to pin down as suggested by design researcher Louis L. Bucciarelli in the above citation. It has even been conceptualised as a meta-discipline, crucial to all professions concerned with 'changing existing situations into preferred ones' (Simon, 1996, p. 111). Social scientist Herbert Simon's definition of design is one amongst many, and design is clearly a term with many connotations (see Atwood, McCain, & Williams (2002)). The word in itself can be understood as both a verb and a noun. As expressed by information systems researchers Alan R. Hevner, Salvatore T. March, Jinsoo Park and Sudha Ram (2004): 'It describes the world as acted upon (processes) and the world as sensed (artifacts)' (p. 78). Thus, design is simultaneously a process and a product, and design research can therefore both be concerned with design processes, design products and the interrelation between the two (Cross, 2007).

As implied earlier, I am principally interested in design as a collaborative process. Contrary to instrumental, functionalist and positivist approaches to design whereby design is measured and scientised, I see design as a social, situated and complex process that is worthy of exploration in itself and not just in relation to its products or productivity (e.g., Bratteteig & Stolterman, 1997; Bucciarelli, 1988; Cross & Cross, 1995; Le Dantec, 2009; McDonnell, 2012; Schön, 1983; Simonsen, Bærenholdt, Büscher, & Scheuer, 2010; Stolterman, 2008). Similar to the paucity of research on museum practice behind the scenes, there has been a tendency to neglect design practice and processes in the history of design research (Cross & Cross, 1995; Lee, 2004; McDonnell, 2012; Olson, Olson, Carter, & Storrøsten, 1992; Poggenpohl, 2009; Stuedahl, 2004). As recently pointed out by design researcher Janet McDonnell, there are many good reasons why this neglect should no longer continue:

> A better understanding of how design, design innovation and design collaboration comes about is a prerequisite for constructive intervention in design education and design practice. Efficiency and effectiveness in design collaboration rely on making it possible for collaborators both to exercise their skills and knowledge relevant to the design task and, at the same time, to be able to exercise their abilities to work collaboratively with others to achieve a shared goal. Alongside a scholarly interest in knowing more about what it is we do when we collaborate to design, there are commercial interests at stake in understanding how to improve design processes and their outcomes. (McDonnell, 2012, p. 44)

As should be clear by now, I see design as a collaborative process. Why, then, insert 'collaborative' in front of design? The answer is quite simple. Similar to McDonnell in the above citation, I wish to stress my focus on collaborative practices in designing. As noted earlier in this section, using the term design exclusively can refer to many things and many interests. Thus, the prefixing of 'design' with 'collaborative' is basically a matter of delineation. For this delineation, I could have used other words, such as cooperative or coordinative.[4] However, I prefer the term collaborative, thus leaning towards a loose definition, as suggested by design researchers Françoise Détienne, Michael Baker and Jean-Marie Burkhardt:

> Although there is no consensus on a definition of collaboration, most researchers would agree that it involves sharing of goals, resources and representations relating to the joint activity of participants. Other important aspects relate to mutual respect, trust, responsibilities and accountability,

---

[4] For a discussion on the difference between the meaning and depth of 'co' implied in these words, see contrasting views in Kvan (2000), Mattessich & Monsey (1992) and Allwood, Traum, & Jokinen (2000). Also, see Davies (2011) for a thorough explanation of co-production and a more narrow view on co-design (i.e., p. 122). Furthermore, see Holdgaard & Klastrup's (2014) critique of an unreflexive use of the term co-creation in the museum literature.

within situational rules and norms. Moreover, the very notion of collaboration seems to presuppose a certain degree of equality between participants in terms of right to contribute (notwithstanding a more or less hierarchical situation) in the context of a socio-institutional mode of organisation that favours co-elaboration of ideas, knowledge objects or tangible artifacts. (Détienne, Baker, & Burkhardt, 2012, p. 197)

Occasionally, I supplement my vocabulary with the term co-design as short for collaborative design. I mostly use this as a verb − co-designing − to signify collaborative design activities (as done in the title of the thesis). While I am aware that co-design is sometimes used to designate design by, for and with potential users of what is being designed (e.g., see Sanders & Stappers (2008)), I see it as a broad term useful for signalling an interest in the 'co' between whoever is involved in a design process.

2.2.2. Collaborative design in a museum context

For the first half of the twentieth century, museums—like all organizations—assumed that all functions would be accomplished in-house. In the second half of the twentieth century, activities ranging from publishing, security, janitorial services, retailing and even curatorial research, were increasingly conducted by non-employees. In the 1960s and 1970s simple contractual relationships defined outsourced services. The museum was in charge, and the service provider delivered a self-contained and tightly defined service. Today these relationships are increasingly complex. A museum's ongoing relationships might include alliances, joint ventures, collaborations, partnerships, or cooperative marketing arrangements. Funders and for-profit enterprises are entering into agreements with museums in increasingly complex ways. (Springuel, 2001, p. 130)

Having established what I mean by the term collaborative design, we can now look for its presence in the museum literature and research. Browsing through journals, books and other publications in this field, collaboration in itself appears to be widely practiced and valued. Museums collaborate internally across different staff groups (e.g., Cooper, 2013; Hansen & Moussouri, 2005; Lee, 2004, 2007b; Macdonald, 2002) and externally with other cultural institutions such as other museums, libraries and archives (e.g., Chun, Jenkins, & Stein, 2007; Kavanagh, 1995; Moussouri, 2012; Robinson, 2014; Tanackovic & Badurinam, 2009; Waibel & Erway, 2009), museum visitors and communities (e.g., Harrison, 2005; Hutchison & Collins, 2009; Kavanagh, 1995; Lynch, 2011; Simon N., 2010), education institutions such as universities (e.g., Boddington, Boys, & Speight, 2013; Søndergaard & Veirum, 2012) and private businesses and consultants of all kinds, including designers (e.g., Fischer, 2001; Moussouri, 2012; Roberts,

2014; Skot-Hansen, 2008, 2009; Søndergaard & Veirum, 2012; Woodward, 2009).

Thousands of museum publications address collaboration, partnership or teamwork. Zooming in on collaborative practices, however, considerably narrows the amount. Thus, much of the literature on collaboration focuses on overall perspectives and/or more or less concrete outcomes while only a small amount goes into the actual interactions taking place in collaborative processes. In the following sections, this small amount is scrutinised by first zooming in on publications that consider external collaborators, such as digital designers. This literature has focused primarily on three areas, thus paralleling the three sub-research questions, namely, 1) the involvement of digital collaborators, 2) the understanding of digital technology and 3) communicating across boundaries. The third area has been researched with greater theoretical and methodological rigour in terms of collaborative design between museum staff internally at museums, particularly in relation to how exhibitions are *negotiated and co-designed*. Secondly, I therefore present conclusions from this work that further supplement the limited knowledge on the issue in relation to developing digital museum communication.

2.2.3. External collaborators in digital projects: Three main foci in the literature

In a recent research publication, museum researcher Susan M. Davies (2011) explores co-production in museums from a museum management perspective, focusing on how external parties are involved in producing temporary exhibitions in Britain. Examining data from 20 case studies (primarily interview data[5]), Davies proposes a distinction between three kinds of external parties in terms of individuals or groups collaborating with museum staff:

1) Paid consultants or freelancers (e.g., private businesses, designers)
2) Those paid by another organisation (e.g., universities, libraries, other cultural institutions)
3) Unpaid volunteers (e.g., museums visitors, communities)

This distinction is also useful in terms of understanding external involvement in developing digital museum communication. While I am mostly interested

---

[5] She describes her primary data as deriving from visiting the exhibition and interviewing key members of the exhibition team, supplemented by opportunistic data collection, e.g. vision documents and operational plans found on websites (Davies, 2011, p. 102). Interestingly, Davies reflects on other approaches consistent with a grounded theory approach, but following the coproduction as it develops is not mentioned. Instead, she mentions other discarded options as 1) action research, 2) a historical approach using archival records and 3) analysis of the finished exhibitions. This may be related to the previously mentioned scarcity within museum research of studying on-going museum practices. Thus, approaching the phenomenon under study in this way does not even occur to Davies.

in the first category, paid consultants, and more particularly those with digital expertise, most of the practice-orientated literature with an eye for external involvement focuses on the third group, the unpaid volunteers, such as museum visitors and communities. For instance, museum visitors (or users) take centre-stage in two very recent special journal issues within the museum field: one on 'designing for creative engagement in museums and cultural institutions' (edited by Stuedahl (2014), in *Digital Creativity*), the other on viewing museums as discursive space (edited by Macalik, Fraser, & McKinley (2015), in *Curator: The Museum Journal*). The growing number of participatory media technologies affording relations between museums and the public (Russo, 2011) can explain this focus in terms of research about digital museum communication. However, a more profound interest in public relevancy and visitor studies also serves as explanation.

This interest has emerged especially since the 1970s when the new museology (Vergo, 1989) re-oriented the focus of museums towards becoming sites of educational engagements and not just centres for research and collection (Boast, 2010). Since then, other popular accounts have further strengthened the focus, such as, to give a few examples, museum anthropologist James Clifford's (1997) notions about 'Museums as Contact Zones', thus promoting inclusionist programmes and shared curatorship; learning researchers John Falk and Lynn Dierkings (1992, 2000) thoughts on museum experience and museums as learning institutions; and, more recently, museum designer Nina Simon's (2010) 'participatory museum' advocating for participatory techniques to give visitors a voice and develop valuable and compelling experiences. While I certainly agree with museum researcher Selma Thomas' 1998 formulation that the external relationship between museums and their audiences has been 'the greatest and most underrated factor about new media' (p. ix), I see a need to redirect attention to other external relationships of great importance nowadays.[6]

When concentrating on external collaboration with digital designers, the relevant literature is further narrowed down. Much of the work in this area is very practical and lacks theoretical and methodological rigour. Also, it often entails a mix and match tendency to mingle good advice concerning everything from the character of the technological product, digital strategy, involving museum visitors, to – what I am interested in – collaborative practices. Some of the literature also looks at other partners, particularly universities (so-called 'triple helix' configurations between museums, higher education and small and medium sized enterprises, e.g. see Clay, Latchem,

---

[6] While there probably are relevant findings within the literature on collaboration with museum visitors and communities, I seek here to include only what is most relevant. I find museum visitors and digital designers to be very diverse groups of external collaborators. As Davies (2011) notes, the one party is typically unpaid while the other one is paid. Further, their knowledge, expertise and potential contributions differ significantly.

Parry, & Ratnaraja (2014) and Søndergaard & Veirum (2012)). Despite these issues, there are some findings with great relevance for my work. When assessed more critically, these findings tend to centre on three foci that will be presented in the following sections.

Involving external collaborators: Depth and timing of involvement

In terms of the depth of involvement, we return to Davies' research on the co-production of temporary museum exhibitions in the UK. Davies (2011) distinguishes between different types of co-production: co-initiating (generating exhibition ideas and the early development of them), co-designing (deciding what goes on display and how it is presented), co-delivery (executing the plans in order to produce the exhibition) and co-managing (defining the project, controlling and monitoring resources). According to Davies' study, the deepest form of co-production happens when external collaborators are involved in more than just delivery and when all parties embrace and see the benefits of working together. Furthermore, external collaborators are commonly involved in idea and concept development and delivering associated events and not so commonly involved in management planning and key decision-making (co-managing). Davies does not judge whether this is good or bad, as, for instance, done by museum consultant Myriam Springuel (2001) who has argued that 'in the future, museums will need to include more people in the decision-making conversation' (p. 129). On the contrary, it may be entirely appropriate, Davies (2010) states, 'but it is only a limited form of co-production' (p. 318).

In the Danish context, new media scholars Nanna Holdgaard and Lisbeth Klastrup (2014) have recently raised attention to the implications and limitations of co-creation processes in museum settings. For instance, they urge museums to reflect on how much power is given to design partners before venturing into co-creation processes, mirroring Davies (2011) in not necessarily favouring a certain depth of co-design. Instead, Holdgaard & Klastrup (2014) want to encourage museums to reflect more on their intentions. This suggestion is derived from a study of a co-creation process in which the design team needed to accommodate a well-established artistic vision and therefore had limited possibility to 'establish a truly creative co-creative process' (Holdgaard & Klastrup, 2014, p. 199). In a report by museum researcher Anne Sophie Løssing (2014), the same issue is mentioned.[7] According to interviewees, the Danish funding system is part of the problem. Thus, digital projects are formulated in fund attainment

---

[7] The report was conducted to analyse the idea of devising a shared digital strategy for 37 museums in a Danish region in Jutland. The suggestions in the report are based on seven interviews with museum managers and two workshops, one with museum staff and one with museum staff and staff from digital design companies.

processes, often influenced by a blind fascination with technological possibilities and well before external collaborators with digital expertise are involved in the projects. Co-design is thereby weakened.

Others have similarly touched upon the importance of timing in terms of the involvement of external collaborators. For instance, culture sociologist Dorte Skot-Hansen maintains that IT developers and multimedia companies become involved too late in digital projects in Denmark (Skot-Hansen, 2008). Also, new media scholars Nanna Holdgaard and Celia Simonsen (2011) critique the tendency to develop digital technologies in 'the last minute with the sole purpose of attracting visitors for the wauw-effect' (p. 114). Similarly, a recent Australian study on interpretation design[8] shows that the late engagement of designers, often after architecture and landscape design has been completed, means that designers are 'unable to contribute' (Roberts, 2014, p. 197).

As in the report by Løssing (2014), the funding system is also mentioned in a recent UK publication on the research project CATH (Collaborative Arts Triple Helix) (Clay, Latchem, Parry, & Ratnaraja, 2014). Again, we encounter Ross Parry who has taken on a central role in the project in which 19 teams (or triplets) were established and awarded 4,000 pounds to develop a digital prototype. The triplets included members from higher education institutions (including arts and humanities researchers and staff from the partner universities' cultural collections), small cultural organisations (including galleries, archives, country houses, theatre groups, a rugby club and a library) and small- and medium-sized enterprises (including graphic designers, design agencies, and software developers). On the basis of interviews, questionnaires and focus group sessions, the report comes with a range of recommendations, for instance, for funding bodies supporting cross-sector collaboration. It is recommended that funding agencies consider introducing stepped programmes and offer a lower first step of funding. At this lower first step, money should be given to allow the establishment of collaborations. A larger amount of money should be given for a second step where digital outputs are developed and user tested. The largest amount should be given for a third and final step where the finished outputs are constructed (Clay, Latchem, Parry, & Ratnaraja, 2014).

The lower step suggested in the CHAT report would impose an early initiation of co-design and could potentially solve some of the problems highlighted in terms of depth and timing of the involvement of digital

---

[8] Interpretation designers are not particularly attentive to digital media, but 'make use of text, image, sculpture, multimedia, soundscapes, spatial layout, theatrical and sensory environments presented in narrative, thematic, scientific or other arrangements to interpret a subject to visitors' (Roberts, 2014, p. 191). See Roberts (2014) and Woodward (2009) for a more thorough explanation. In spite of digital media not taking centre-stage in interpretation design, I find the findings relevant to mention.

collaborators. However, there is a need to investigate these matters more thoroughly. Particularly noteworthy, none of the studies mentioned observe how collaborations develop over time by looking more closely at actual collaborative design interaction.

Understanding digital technology: The lack of digital understanding in museums

While some authors write about a continual integration of digitality in museum institutions and exhibitions (see section 2.1.2), others outline a less optimistic picture. All seem to agree, however, that integration was indeed an issue in the early days of museum computing. In 1981, computer consultant Lenore Sarasan presented a study initiated by the Association of Systematics Collections in 1979 to examine the problems facing museums applying computer technology for collection management. Based on a mail questionnaire and visits to selected institutions, Sarasan (1981) concluded that there was 'a serious lack of understanding the use of computers' (p. 43). The article thus ended with a warning:

> ...project initiators and managers must be willing to acquire sufficient knowledge about computers to use them effectively. If project personnel are not willing to make this investment, they should seriously reconsider becoming involved in costly projects that hold little possibility of success. (Sarasan, 1981, p. 49)

This lack of understanding is also mentioned by Parry (2007, pp. 124-125) who describes how curators found technology hard to understand, difficult to use and surrounded by a cryptic, painfully difficult discourse in these early days. Decades later, inadequate understanding is still seen as a factor limiting the success of museum projects using technology. Thus, in the late 1990s, Katrine Jones-Garmil (1997), co-editor to the highly acclaimed book *The Wired Museum* (Jones-Garmil & Anderson, 1997), referred to a 'general lack of technical expertise in the area of imaging and multimedia' (p. 53). Furthermore, Parry (2007) alludes to a study mapping the training requirements of the UK cultural heritage sector in 2000 (Adegoroye, et al., 2000) where ICT skills still proved to be lacking.

In the Danish context, the lack of digital understanding has also more recently been revealed (e.g., Holdgaard & Simonsen, 2011; Løssing, 2008; Løssing, 2014; Skot-Hansen, 2008). Based on her research on Danish art museums' use of the web, Løssing concludes:

> Museums lack thorough knowledge of the web as medium and tools for communication and exhibition activities. Consequently, they lack actual strategies and visions within this area. This stands in the way of a higher

degree of interplay between the web and other activities in individual museums. (Løssing, 2008, p. 318)

Similarly, Holdgaard and Simonsen (2011) find that digital technologies and media are considered add-ons to the traditional forms of museum dissemination and communication. They point to different explanations, one being that museums typically lack know-how and knowledge about digital media and technologies. Many Danish museums collaborate with external partners with digital expertise on projects involving digital technologies and media. However, when these projects are finalised, the know-how and knowledge disappear from the organisation (Holdgaard & Simonsen, 2011). In line with this, Skot-Hansen (2008) calls for a strengthening of the network and collaboration between museums, researchers, artists and multimedia companies as an important factor in developing the area of digital museum communication in Denmark.

In sum, this focus represents an interest in how digital technology is understood or – more precisely – is not understood in a museum context. However, the literature pointing to this deficit does not engage with actual collaborative practices. Interestingly, this proposed lack of digital understanding is both an argument *for* collaborating closer with digital design companies and a potential challenge *in* these collaborations, thus relating to the two other foci.

Communicating across boundaries

Many information system design situations today include users, designers, and developers who, with their own unique group and individual perspectives, need to interact so that they can come to a working understanding of how the information system being developed will coexist with and ideally support patterns of work activities, social groups, and personal beliefs. In these situations, design is fundamentally an interactive process that requires communication among users, designers, and developers. However, communication among these groups is often difficult although of paramount importance to design outcomes. (Sonnenwald, 1995, p. 859)

As suggested in the above citation, communication between social groups is of paramount importance to design outcomes. Indeed, this has been concluded on several occasions in the design literature and boundary-crossing activities have been intensely researched within this field (e.g., Bucciarelli, 1988; Cross & Cross, 1995; Feast, 2012; Kleinsmann, 2006; Kleinsmann & Valkenburg, 2008; Krasner, Curtis, & Iscoe, 1987; Sonnenwald, 1995, 1996; Walz, 1988). However, research is still scarce in

relation to the museum context, particularly in terms of collaborative design with external collaborators, such as designers.

As implied in the previous section, the lack of digital understanding may pose a problem in this regard. Firstly, this lack of understanding can result in conservative attitudes towards technology (Holdgaard & Simonsen, 2011; Skot-Hansen, 2008; Parry, 2007). Secondly, inexperience can greatly affect the designer, placing a burden on the designer to educate the client or draw forth 'unspoken or underlying project aims' (Roberts, 2013, p. 199). In both cases, communicating across boundaries and building relationships of trust can be extremely challenging. Additionally, different languages and concerns across work disciplines and organisations are mentioned as barriers in the museum literature (Clay, Latchem, Parry, & Ratnaraja, 2014; Davies, 2011; Løssing, 2014; Parry, 2007; Sarasan, 1981). This may, for instance, result in contrasting conceptions of objectives, work roles and responsibilities. In the CATH project report mentioned earlier, brokering is declared as an important factor for dealing with such issues. Thus, a broker with knowledge about all sectors involved can help 'establish sustainable and productive collaborations' (Clay, Latchem, Parry, & Ratnaraja, 2014). Similarly, Løssing (2014) points to solutions related to brokering in her report, namely, in the form of having digital ambassadors at museums and a digital support unit.

While there is a significant amount of research in the design field exploring communication across boundaries, the museum studies mentioned above only deal superficially with this subject. Again, I point to the fact that none of these studies observe how collaborations develop over time by looking more closely at the actual collaborative design interaction. However, in relation to collaborative exhibition design between museum staff internally at museums, there are some studies that employ such an approach. Conclusions from these studies are further presented in the next section to supplement the limited knowledge on the issue in relation to developing digital museum communication.

2.2.4. Internal exhibition negotiation & co-design across boundaries: Three lenses for exploring heterogeneity

First-person narratives relating personal experiences with the design of museum exhibitions, and thin descriptions about museum exhibit development based on practical experience are readily available. However, explicitly ethnographic work of museum exhibition designers is highly unusual. Topics in the practically-oriented museum studies literature

typically include: phases of the exhibit development process, composition of the development team, and types of exhibits. (Lee, 2004, p. 70)

While much of the literature concerned with exhibition development is based on practical experience, as noted by design researcher Charlotte Lee in the above citation, there are some studies in this domain taking a deeper look at collaborative design interaction within museums. Even though their primary concern is the interaction between different museum staff groups, the 'museum inside' (Yaneva, 2003, p. 116), they point to interesting characteristics, approaches and conflicts that can also be relevant when digital designers are added to the equation.

These studies tell stories of the messiness and complexity characterising collaborative exhibition design. As Macdonald (2002) writes, her research behind the scenes of the museum is concerned with recovering 'some of the mess that is tidied away in the finished product' (pp. 245-46). This finished product is thus based on a complexity that should not be dealt with too narrowly, or tidied away, when we attempt to frame it (Macdonald, 2002). As anthropologist of architecture Albena Yaneva (2003) has showcased, art installations emerge in 'a collective chaotic hubbub rather than in quiet artistic solitude' (p. 127). Similarly, museum researchers Anders H. Hansen and Theano Moussouri (2004) conclude that building exhibitions 'is a process of maturation, a dynamic development process, rather than an instrumental implementation of a plan, or execution of already established knowledge' (p. 172). Thus, messiness and complexity can be understood as the very core of exhibition development, as done in the famous study of scientific work at a museum of Vertebrate Zoology by Susan L. Star and James R. Griesemer (1989), founders of the highly acclaimed concept 'boundary objects'. In order to work together, Star and Griesemer (1989) argue, participants in intersecting worlds translate, negotiate, debate, triangulate and simplify, ending up in representations that contain 'at every stage the traces of multiple viewpoints, translations and incomplete battles' (p. 413). The coexistence of heterogeneity and cooperation is understood not as resulting in consensus but in tension and complex resolutions (Star & Griesemer, 1989).

In the studies mentioned above, differences across participants are a central point of interest. Research accounts vividly portray the difficulties in collaborating across boundaries, talking about 'blood, sweat, and tears' (Macdonald, 2002, p. 245), 'stubborn buggers' and 'factional warfare' (Macdonald, 2002, p. 260), 'different conceptions' (Schneider, 1998, p. 31), 'battle', 'power' and 'struggles' (Schneider, 1998, p. 32), 'controversies' (Yaneva, 2003, p. 126), 'fire-fighting' (Hansen & Moussouri, 2004, p. 171), 'value struggle' (Hansen & Moussouri, 2004, p. 170), 'conflicts' (Lee, 2004,

p. 134) and so on. Much of this literature does not, however, view these difficulties arising in differences as something negative. Rather, as Lee (2007b) suggests, the resulting conflicts should be brought out into the open and explored since they hold the key to mutual learning and cultural exchange.

What we can learn from these studies is that communicating and co-designing across boundaries within the museum context is not a simple endeavour. Rather, it requires constant negotiation because of different viewpoints, perspectives, ideals, concerns and the like. In the following three sections, I go a bit further into concrete conclusions regarding these differences, presenting three particularly interesting theoretical lenses used to explore and understand the messy dynamics, namely, 1) communities of practice, 2) curriculum theories and 3) values.

Communities of practice

One way of exploring differences is through the theory of 'communities of practice' (Lave & Wenger, 1991). Communities of practice are informal and pervasive. We all belong to different communities of practice and we learn, understand and construct our identities in relation to these communities (Lave & Wenger, 1991; Wenger, 1998). Communities of practice theory has been used and explored in different fields of museum studies (e.g., Hansen & Moussouri, 2004; Kelly, 2004; Kelly & Gordon, 2002; Lee, 2004, 2007a, 2007b; Moussouri, 2012; Stuedahl, 2011). In terms of internal exhibition negotiation and co-design, works of Lee (2004, 2007a, 2007b), Hansen and Moussouri (2004) and Mourssouri (2012) are particularly interesting.

Lee (2007b) characterises the conflicts arising from developing an exhibition as 'the inevitable result of communities of practice coming together to create something new' (p. 183). To reach this conclusion, she studies an interdisciplinary team designing an exhibition for an American natural history museum, particularly focusing on the way artifacts are used to coordinate the design work and create shared understanding. She identifies several communities of practice within the exhibition team in her study, most salient those that are based in functional units. Seen from her perspective, there were boundaries between, for instance, educators, designers, fabricators and curators. For the participants, however, the communities of practice were not always visible, especially not for two curators from another institution who also participated in the team, resulting sometimes in confusion and frustration. For instance, the curators anticipated having a leading role but ended up in a more consulting role because others in the group saw exhibition making as a more collaborative

venture. Lee's intention is not to suggest a reductionist model; for instance, not all educators will act in the same way. However, those in a community of practice can share some practices and reifications that contrast with other ways of thinking. Thus, communities of practice can be useful for understanding why people act in certain ways and why conflicts emerge.

In studies connected to the mirror project,[9] communities of practice theory has also been investigated in relation to cooperative practices among natural history museum staff. These studies support the notions put forth by Lee that boundaries between communities of practice are blurred, complex and changing, yet communities of practice theory is valuable in terms of exploring and supporting collaborative exhibition development (Hansen & Moussouri, 2004; Moussouri, 2012). The connection with the CSCW (Computer Supported Cooperative Work) field is evident in these studies, having a considerable focus on how to develop computer systems that can support the work of exhibition teams. I will not go further into these issues since they are not as such relevant for my work. Instead, I turn to another attempt to understand the heterogeneity and consequential conflicts in designing exhibitions.

Curriculum theories

Museum researcher Margaret Lindauer (2005) argues that differences of opinion in an exhibition development team should be understood as a result of debates over curriculum theories rather than professional divides. Curriculum refers to what the museum teaches, to what kind of educational intent informs the practice. In a study of museum staff at Brooklyn Museum, she finds that individual staff members can endorse different approaches affiliated with four different curriculum theories:

- A laissez-faire curriculum theory: In approaches building on this theory multiple options are given to the visitor. Learning activities should be self-managed and self-motivated rather than prescribed. Hence, the exhibition is viewed as a salad bar where the visitor chooses what s/he wants to explore.

- A Tylerian curriculum theory: An educational programme pertaining to this paradigm seeks to teach the visitor something that s/he could or should know. The museum has authority and imparts

---

9 The mirror project was 'a European Commission Framework Programme 5 Information Society Technologies (FT5 IST) project aimed at enhancing and improving co-operative practices through the use of new technologies' (Hansen & Moussouri, 2004, p. 172). Museums located in Sweden, Denmark, Belgium, France, Italy, France, Greece and the UK participated in the research (see Hansen & Moussouri (2004)).

important facts and ideas to educate the visitor who, metaphorically, can be seen as a novice or a protégé.

- A constructivist or problem-solving curriculum theory: In a constructivist or problem-solving approach, the visitor is metaphorically seen as a partner with whom the museum is in dialogue. The visitor is invited to participate in problem solving, to use his/her own mind and reflect about issues to stimulate emergent opinions, explanations or interpretations.

- A narrative curriculum theory: This approach focuses on the good story. The museum metaphorically plays the role of a storyteller and the visitor is invited to likewise craft a narrative related to the story told in the exhibition.

Because of these different curriculum theories, museum staff may be working at cross-purposes during an exhibition development 'metaphorically setting out to simultaneously create a satisfying salad bar, initiate a novice, pose an intriguing problem for exploration, and/or tell an engaging story' (Lindauer, 2005, p. 50).

Values

In recent studies scrutinising tension and conflict in museum organisations, differences in values have been highlighted as important (Davies, 2011; Davies, Patona, & O'Sullivana, 2013). Again, we return to Davies. Besides looking at the patterns of external involvement in coproduction at museums, she further investigates values relating to exhibition development internally at museums, stating that these internal values influence coproduction with external parties. The result is the figure inserted below (Figure 4), the so-called Museum Values Framework (Davies, 2011; Davies, Patona, & O'Sullivana, 2013).

CLUB   Hands-on research / discovery   *Multiple interpretations. Informal sources.*   Re-interpreting the past   FORUM

Saving and protecting objects

Sharing and involving

Open / flexible interpretation

The museum community   Internal focus   External focus   *Visitors and potential visitors*

Protecting and controlling

Accessibility and enjoyment

Controlled interpretation

Honouring past achievements

Spreading knowledge

TEMPLE   *Single narrative. Formal sources.*   VISITOR ATTRACTION

Figure 4: The Museum Values Framework (Davies, Paton & O'Sullivan, 2013)[10]

The model is an adapted version of the Competing Value Framework (CVF) developed by Quinn and Rohrbaugh (1981). The adaption is based on data from 20 case studies in which especially three areas in relation to values turned out to play a significant role in shaping the nature of coproduction: 1) who was perceived as the audience/stakeholders, 2) how knowledge was conceptualised and presented and 3) how the function of the museum was perceived. These areas are manifested in the model as 1) the spectrum between valuing an internal focus towards the museum community and valuing an external focus towards visitors and potential visitors (the x-axis) and 2) the spectrum between knowledge valued as absolute truth with fixed and controlled meanings and knowledge valued as context dependent and open to multiple interpretations (the y-axis).

The four quadrates manifest four different modes that can further be explained as:

- The club mode: In the club mode, the museum is seen as a club for like-minded people coming together. The needs of these people are well provided, but for others, it can seem unwelcoming and difficult to join.

---

[10] The first version of The Museum Values Framework can be seen in Davies (2011), p. 172.

- The temple mode: As a temple the museum is also inward looking, but instead of serving the club members, approval from acknowledged experts is valued (e.g. museum professionals, academic experts and cultural commentators). The professional experts function as authoritative 'priests', telling the visitors about the content. Beauty and knowledge are highly valued aspects, but only a narrow audience has influence on the shape of these aspects since the overall goal is expert acknowledgement.

- The visitor attraction mode: Visitors are the main focus in the visitor attraction mode in which visitors are seen as income generators. Here, visitor needs are assessed in order to communicate effectively and satisfy 'the customers'. Values are shared with commercial businesses and profit-making attractions which can result, on the one hand, in highly visitor-centred and relevant exhibitions and, on the other hand, in criticism for being too commercial and unscientific.

- The forum mode: Visitors are also in focus in the forum mode, but the aim is to benefit society and individual well-being instead of generating commercial value. Here, debate and reflection are encouraged, and visitors are seen as co-owners of the museum. Social justice, inclusion and experimentation are of high priority, sometimes resulting in excessive experimentation according to some critics.

In the above sections, I have presented three theoretically informed ways of exploring and understanding the dynamics of heterogeneity in collaborative exhibition design processes as corresponding to the interaction between different communities of practice, different curriculum theories and different values. It is clear that these approaches overlap. They all point to different groupings within organisational and societal structures that influence and are influenced by individual participants in the collaborative processes. None of them seeks to be reductionist in framing individuals or groups in static, deterministic ways; instead they show the significance of different groupings, whether related to communities of practice across or within functional units (educators, designers, fabricators, curators etc.), related to educational intent (wanting the exhibition to be a salad bar, an initiation of a novice, a problem posed for exploration or an engaging story) or related to values (valuing the museum as a club, forum, temple or visitor attraction). Overall, these perspectives from 'the museum inside' provide further clarification of the need to more thoroughly explore the complexities of collaborative design interaction between museum staff and digital designers than has been done to date.

2.3. BROADER POSITIONING & RELEVANT THEORETICAL CONCEPTS

So far, the argumentation in the literature and theory chapter has pointed to three central themes that are worthy of more careful exploration, parallel to my three sub-research questions, namely, 1) the involvement of designers 2) the understanding of technology and 3) the negotiation and co-design across boundaries. To explore these issues more carefully, I build on broader approaches and perspectives developed in the interweaving of STS and symbolic interactionism. Particularly, Clarke's (2003, 2005) recent development of grounded theory into situational analysis forms a central framework for my analysis. Further, I supplement this framework due to my interest in emergence and temporal complexity. While I explain what this supplement entails methodologically in the methods chapter, I introduce my theoretical inspiration and selected theoretical concepts useful for interpreting positional and artifactual emergence in the present chapter. First, however, it is necessary to briefly clarify the relation between STS, symbolic interactionism and situational analysis.

2.3.1. A symbolic interactionist approach to STS

We now return to STS from which the technology discussions presented in section 2.1.1 largely originate. STS is an interdisciplinary, heterogeneous field spanning many academic disciplines, all having an interest in science, technology and society. STS has roots in social constructivist explorations of scientific knowledge in the 1970s (Sociology of Scientific Knowledge, SSK) and has emerged across a range of subfields, such as SCOT (Social Construction of Technology), SST (Social Shaping of Technology), ANT (Actor Network Theory), Post-ANT and feminism (Jensen, Lauritsen, & Olesen, 2007; Sismondo, 2009).

More specifically, my work is positioned within a symbolic interactionist approach to STS (Bossen & Lauritzen, 2007; Clarke & Star, 2003). Symbolic interactionism has roots in American pragmatism (for instance, John Dewey and William James) and has been informed particularly by sociologist George Herbert Mead in his coupling of pragmatist ideas and sociology (Bossen & Lauritzen, 2007). Sociologist Herbert Blumer (1937), one of Meads students, is the first to use the term 'symbolic interactionism'. He has carefully formulated the nature of symbolic interactionism, outlining three simple premises of a symbolic interactionist perspective and method: firstly, human beings act towards things according to the meanings they ascribe to the things; secondly, these meanings arise out of social interaction

with others; and thirdly, these meanings are processed interpretatively in the actual encounter with things (Blumer, 1969, p. 2).

In terms of STS, a symbolic interactionist approach has been developed particularly through sociologist Anselm Strauss and more concretely and explicitly by some of his students, e.g. STS researchers Adele Clarke, Joan Fujimuras and Susan Leigh Star (Bossen & Lauritzen, 2007; Clarke & Star, 2003). This approach is manifold and not easily conceptualised. However, one thing stands out as typical, namely, a special eye for work and social organising, as expressed by the two prominent figures Clarke and Star in their reflections on entering the STS field in the 1980s:

> Interestingly, in contrast to others, we interactionists were starting from sites in the sociology of *work* (not language or practice alone), centered around examining what people *do* as well as what they *say* they do, situated in the larger contexts of careers, materials, techniques, theories, organizations, and professions. Interactionists' efforts here 'passed' immediately as studies of scientific lab practice, very hot at that time and still important, although some of our sociology of work points were not immediately grasped. Regardless, we found ourselves rather quickly in the heart of this burgeoning, controversial, and lively field, and happily remain so. (Clarke & Star, 2003, p. 539)

This particular interest in work, understood as something people do together (Clarke & Star, 2003, p. 562), conflates with my interest. Thus, my reason for aligning with a symbolic interactionist approach is exactly this idea about starting from the sites of work, from examining how people work together and organise their work – how they interact in collaborative design processes. Further, my goal is to expose some of the invisible work behind the digital at museums similar to others taking a symbolic interactionist approach to STS (Bossen & Lauritzen, 2007, p. 142; Clarke, 2005, p. 76). Like Clarke & Star (2003), for instance, mention – talking about the 1980s – they rebelled against common, often functionalist doctrines to 'Ignore the body, the invisible work, the information of your senses. Ignore the maids, the janitors, and the messes that get made on the countertops of production' (p. 562).

A brief note about other possible positionings is appropriate at this point. The interest in exposing what is invisible or 'blackboxed' is largely shared with other STS approaches. ANT, for instance, could similarly have given me many good tools and perspectives for this purpose. In ANT, however, the main concern is to visualise how actors constitute and are constituted by networks with a particular interest in dissolving boundaries between human and non-human actors (Olesen & Kroustrup, 2007). While a symbolic interactionist approach is also very concerned with materiality (exemplified

in famous and widely used conceptual developments such as 'boundary objects' (Star & Griesemer, 1989) and 'standardized packages' (Fujimura, 1992)), the starting point is *work practices and interaction between social groups/worlds*.

Being concerned about practices, I could also have positioned my work within 'the practice turn' (Schatzki, Cetina, & Savigny, 2001) and I could have used practice-based methods for my study (Gherardi, 2012; Nicolini, 2012). With its pragmatist roots, a symbolic interactionist approach is indeed related to practice theory and I consider my work as relevant for this field. However, I have chosen primarily to position my work within STS and symbolic interactionism in this thesis because of the specific interest in *technology* and *interaction*, more specifically, *how technology emerges in collaborative design interaction between different social groups/worlds*. Thus, I find a symbolic interactionist approach to STS most relevant for answering the research question posed. Particularly, situational analysis has a central role in this regard.

2.3.2. The theoretical underpinnings of situational analysis: A cake with three layers

Clarke (2005) has recently taken up the challenge to move and merge insights from symbolic interactionism, STS and postmodernism (e.g. building on Mead, Blumer, Strauss, Latour, Law, Mol, Haraway and Foucault)[11] into a new, timely theory/method package for doing 'grounded theory after the postmodern turn' (Clarke, 2005). This theory/method package termed 'situational analysis' offers three different visual mapping techniques intended as supplementary analytical exercises to the traditional grounded theory approach. Situational analysis is increasingly becoming an acknowledged, widespread research approach, used by many scholars across disciplines (Clarke & Charmaz, 2014)[12] and presented in publications, such as, *Handbook of Grounded Theory* (Charmaz & Bryant, 2007); *Handbook of Social Science Methodology* (Outhwaite & Turner, 2007); *Developing Grounded Theory: The Second Generation* (Morse, Stern, Corbin, Bowers, Charmaz, & Clarke, 2009); *Encyclopedia of Philosophy and the Social Sciences* (Kaldis, 2013) and *Grounded Theory and Situational Analysis* (Clarke & Charmaz, 2014). In addition, Clarke is preparing a second edition of her masterpiece on situational analysis from 2005 (Clarke, Friese, & Washburn, forthcoming).

The lineage of situational analysis to symbolic interactionism anchored in Mead and Blumer is evident. Thus, Blumer's student, Strauss, developed

---

[11] The distinctions between these three directions are not clear-cut and will therefore not be treated as such in the following presentation.
[12] See a listing on Clarke's blog about situational analysis:
http://clarkessituationalanalysis.blogspot.dk/p/sa-in-action.html

grounded theory (along with Glaser (Glaser & Strauss, 1967)) as a method to ensure that the empirical world 'must forever be the central point of concern', to cite Blumer (1969, p. 22). The idea of grounded theory is basically to develop theory grounded in the systematic analysis of empirical data, contrary to seeing empirical data as mere examples of theoretical concepts (Glaser & Strauss, 1967; Bossen & Lauritzen, 2007). Clarke, a student of Strauss, is however critical of positivist underpinnings of grounded theory and seeks to revise grounded theory to more fully take emergent and constructivist elements into account in line with, for instance, sociologist Kathy Charmaz (1995, 2000). In particular, she strives for developing methods that take complexities seriously. As Clarke has recently expressed in an interview with sociologist Reiner Keller:

> ...to me, the primary need for qualitative research is to enhance our capacities to address complexities. This is the fundamental methodological challenge of our day. (Clarke & Keller, 2014)

Situational analysis is her take on dealing with this challenge and pushing 'grounded theory/symbolic interactionism even further around the postmodern turn than it always already is' (Clarke, 2005, p. 19). Clarke is thus firmly grounded in symbolic interactionism, stressing that her work consists in explicating perspectives already inherent in symbolic interactionist thinking and updating them to suit methodological challenges and developments of 'our day'.

While traditional grounded theory is centred on basic social processes and action, situational analysis is guided by another development by Strauss, namely, his *social worlds framework*,[13] an extension of symbolic interactionism developed in parallel with grounded theory (see Clarke (2005) p. xxii and p. xl). To fully grasp situational analysis, this framework needs to be explicated.

In a social worlds framework, social worlds and the interaction within and across them are the locus of study (Strauss, 1978a). While symbolic interactionism has been commonly critiqued for representing primarily micro level analysis which focuses on individual actors and their agency (Fine, 1993, p. 68), a social worlds framework can be seen as a move upwards, expanding the perspective of symbolic interactionism towards structural and organisational matters. Strauss turns from weighing micro-level analysis (i.e., Strauss, 1959) throughout the 1960s and 1970s, publishing two significant works in 1978 on 'a social worlds perspective' and negotiating social order (Strauss, 1978a, 1978b, see also Clarke & Keller

---

[13] Like Star (2010, p. 604), I see social worlds and communities of practice (Lave & Wenger, 1991; Wenger, 1998) as largely the same thing. I therefore use these terms interchangeably.

(2014)). He later uses the concept of 'arena' to designate this broader atmosphere in which social worlds fluidly interact:

> The concept of arena will refer here to interaction by social worlds around issues – where actions concerning these are being debated, fought out, negotiated, manipulated, and even coerced within and among the social worlds. It can be individuals who do the acting, but for sociological purposes we want to locate them in some sort of social unit. (Strauss, 2010, p. 226)

An arena is thus an epicentre of interaction between different individuals located within different social units, termed social worlds/sub-worlds. Arenas are basically 'whirlpools of argumentative action' (p. 227) that 'whirls around within a galaxy of other arenas' (p. 229) as Strauss (2010) puts it, existing on every level of organisational action and central to performance, change, creation and maintenance of social worlds and social order. Arenas arise in disagreements and unresolvable issues in the most microscopic to the most macroscopic situations. They are abstract and infinite phenomena, always and everywhere arising, changing and reforming. Due to this infinity, *defining the situation of interest* is essential for analytical purposes, echoing the doctrine of situational analysis.

In his book *Continual Permutations of Action*, Strauss (2010) addresses six different kinds of processes in the interplay between social worlds and arenas. First, there is the process of *representation* that refers to how an organisation of social worlds/sub-worlds is represented and how influencing this representation is fought out internally within organisations and externally in relation to other organisations. Second, the process of *the defining of issues* is related to getting others to see issues as you do, agreeing on how to define an issue and its importance. Third, developments due to new aspects and/or new participants involved in the arena are referred to as the process of *the evolving of issues*. Fourth, the process of *the matching of social worlds with the issues* is about selecting, rejecting and reshaping issues in alignment with images and aims of social worlds and their representative organisations. Fifth, *the getting involved with alliances* depicts the process of forming as well as deforming alliances between social worlds. Finally, the process of *the intersecting of arenas* points to the wider context of arenas, called domains, within which different arenas coexist and intersect. Besides these six processes, Strauss (2010) points to two more general sets of processes, namely, interactional processes (negotiating, persuading etc.) and work processes. Together, all of these processes continually influence and are influenced by the structural skeleton of arenas, social worlds, organisations and domains.

Clarke largely adopts Strauss' social worlds framework and builds situational analysis on top of it. As she states in her first article on situational analysis:

> Situational maps and analyses do a kind of 'social inversion' in making the usually invisible and inchoate social features of a situation more visible: all the key elements in the situation and their interrelations; the social worlds and arenas in which the phenomena of interest are embedded; and the discursive positions taken and not taken by actors (human and nonhuman) on key issues. This is the postmodernization of the social in a grounded theory grounded in symbolic interactionism. Situational maps and analyses resituate grounded theory after the postmodern turn in a wide variety of ways that enable us to better grasp the complexities of social life even if ultimately we 'cannot pin them down.'[14] (Clarke, 2003, p. 572)

Simplistically put, Clarke builds a cake with three layers consisting of: grounded theory in a symbolic interactionist perspective, supplemented with Strauss' social world development of symbolic interactionism and topped with a postmodernist urge to grasp complexities of social life. Clarke could have stopped at serving this theoretical manifesto, but her goal is a 'theory/method package' (Clarke, 2005, p. 2). Thus, she also gives advice on how to 'eat the cake' by offering a set of concrete methods – three visual mapping techniques.

2.3.3. Methodological implications for exploring involvement, understanding, negotiation and co-design

The main trait of situational analysis are the three visual mapping techniques focusing on different analytical aspects. *Situational maps* focus on all elements in a situation (human, non-human, discursive etc.) and the relationship between them. *Social worlds/arenas maps* focus on the grouping and relations between various actors in a situation, mapped in terms of social worlds/arenas theory. *Positional maps* focus on major concerns negotiated in a situation.[15] These maps are intended as analytical exercises to be conducted by the researcher throughout a research project (Clarke, 2005).

The maps serve as great basic frameworks for exploring more carefully the three central themes outlined in the previous sections of this chapter: 1) the involvement of digital designers, 2) the understanding of digital museum communication and 3) the negotiation and co-design across boundaries. I

---

[14] Clarke refers to Law and Mol (2002): 'Things add up and they don't. They flow in linear time and they don't. They exist within a single space and escape from it. That which is complex cannot be pinned down. To pin it down is to lose it' (p. 21).
[15] I will present these techniques more fully in the methods chapter (see section 3.3.4).

have engaged analytically with these three themes by continuously making all kinds of situational maps as will be clarified and exemplified in the methods chapter (see section 3.3.4). However, two kinds of situational maps – social worlds/arenas maps and positional maps – play particularly valuable roles in my analysis.

As noted in the introduction, the analysis is thus divided in two. The first part of the analysis (Chapter 4) engages with the involvement of designers and the understanding of digital museum communication using social worlds/arenas maps. These maps help illuminate the connection between the social worlds involved and point to interesting developments regarding the understanding of digital museum communication. This analysis also builds on Strauss' theorising about processes in the interplay between social worlds and arenas. The second part of the analysis (Chapter 5) engages with the negotiation and co-design of digital museum communication using positional maps. These positional maps help elucidate positions taken across different social worlds, museum staff and digital designers as well as internally within these groups. Further, these different positions point to how digital museum communication is co-designed.

2.3.4. Focusing on emergence: Adding temporal complexity to the cake

> Practically, of course, the novel is constantly happening and the recognition of this gets its expression in more general terms in the concept of emergence. Emergence involves a reorganization, but the reorganization brings in something that was not there before. The first time oxygen and hydrogen come together, water appears. Now water is a combination of hydrogen and oxygen, but water was not there before in the separate elements. (Mead, 1962, p. 198)

So far, so good: I have used the simple metaphor of a three-layered cake to present the theoretical underpinnings, as I understand them, of situational analysis. Further, I have briefly presented the methodological implications of situational analysis, particularly the three situational maps and how I use them to explore involvement, understanding, negotiation and co-design. What remains to be dealt with in this chapter is what I have chosen to add to the 'situational analysis cake'. This particularly relates to the third layer of the cake – the postmodernist interest in complexities – that I have so far not adequately presented. Here, Clarke (2005) refers to thinkers connected to STS (for instance, Latour, Mol, Law and Haraway) and, as 'the primary path around the postmodern turn' (p. 52), to social theorist Michel Foucault. By drawing heavily on Foucault, Clarke (2005) centres the postmodern layer on power, disciplining and discourses (p. 60). This choice makes great sense,

as Clarke shows by comparing Foucault with Strauss and symbolic interactionist perspectives. Further, Clarke has, particularly when it comes to issues of power, worked with related concepts. For instance, the concept of *implicated actors*, (Clarke & Montini, 1993), pointing to human actors (or non-human actants as Clarke (2005) adds) that are silenced or only discursively present in a situation. Concretely, positional maps can help elucidate these implicated actors and actants due to potentially missing positions in the maps (see Clarke (2005) p. 46-48 and p. 132-33).

While these issues are indeed important and have some relevance for me, my situation is different. I am thus particularly interested in *emergence* as is clear in my research question. Due to this interest, I adapt and expand situational analysis in a particular way. While I explain what this entails methodologically in the methods chapter, my goal here is to specify the theoretical rationale and inspiration behind this focus. Similar to Clarke (2005), my point is not to propose changes to grounded theory/situational analysis per se. On the contrary, my aim is to push situational analysis to more fully engage with temporality, particularly complexities of how things emerge across boundaries.[16]

Indeed, temporality and emergence are fundamental in a symbolic interactionist perspective. Mead greatly philosophises about such elements in *The Philosophy of the Present* (Mead, 1962, from which the preluding citation derives) where he ponders on the fluidity, incomprehensibility and complexity of time and the perception of time. As he, for instance, writes: 'For that which marks a present is its becoming and its disappearing' (Mead, 1962, p. 35). Blumer (1969) similarly points to the significance of time in the symbolic interactionist concern with 'processes', 'ongoing activity', 'ongoing action', 'ongoing group life' and so on. Correspondingly, a process perspective is implied both in a grounded theory context (due to the interest in basic social processes) and in the social worlds framework outlined earlier in this chapter. The distinction between process and variance has been discussed extensively in the organisation literature (e.g., Langley, 1990; Markus & Robey, 1988; Mohr, 1982) and a fraction of scholars inspired by symbolic interactionism (among other things) currently develops process perspectives under the label of *process organization studies* (Langley & Tsoukas, 2010).[17] As will be evident in the methods chapter, I draw on some of these scholars in my efforts to expand on the methods proposed by Clarke.

Additionally, I use two theoretical perspectives to concretely interpret emergence in the second part of the analysis, the part in which I use

---

[16]This will be explained further in the methods chapter since it is related to method development (see section 3.3.3).
[17] See also Helin, Hernes, Hjorth & Holt (2014) and Hernes (2014).

positional maps. These two perspectives are employed to interpret positional emergence and artifactual emergence. In the following sections, the theoretical concepts used for this interpretation are introduced.

Interpreting positional emergence: Introducing Bakhtinian concepts

> ...there can be neither a first nor a last meaning; it always exists among other meanings as a link in the chain of meaning, which in its totality is the only thing that can be real. In historical life, this chain continues infinitely, and therefore each individual link in it is renewed again and again, as though it were being reborn. (Bakhtin, 1986, p. 146)

In terms of interpreting temporal emergence in collaborative design, I find some of the concepts discussed by philosopher Mikhail Bakhtin particularly useful for supplementing the situational analysis framework, namely, his notions of centripetal/centrifugal forces and ambiguity. Bakhtin was interested in the infinite process and unfinalisability of things, principally in relation to language and literary theory, but also more narrowly in relation to the self and more broadly in relation to culture and meaning, as in the above citation.

Others have pointed out ontological similarities between the work of Bakhtin and symbolic interactionists, especially Mead (e.g., Fine, 1993; Nielsen, 2000; Nielsen, 2002) and the usefulness of Bakhtinian thoughts for understanding process in relation to social groups and organising (e.g., Cunliffe, Helin, & Luhman, 2014; Langley & Tsoukas, 2010). Moreover, some have argued that there has been a recent 'dialogic turn' across diverse fields that seek to understand the construction of knowledge in light of dialogue among diverse participants, for instance, drawing on Bakhtin to concretely analyse communication across differences (e.g., Anderson, Baxter, & Cissna, 2004; Baxter, 2006; Baxter, 2011; Phillips, 2011; Phillips, Kristiansen, Vehviläinen, & Gunnarsson, 2013). In my reading of Bakhtin, I am inspired by all of these scholars, particularly those who have developed Bakhtinian concepts to more concretely analyse organising, social practice and communication across differences. I do, however, primarily refer to Bakhtin in the following introduction to the selected concepts.

We start with the dualistic concepts 'centripetal forces' and 'centrifugal forces'. The terms centripetal and centrifugal originate in physics where centrifugal forces were first described by mathematician Christiaan Huygens and centripetal forces by physicist Isaac Newton in the seventeenth century (Meli, 1990). They can be used to understand the forces upholding circular motion, for instance, in the case of an object circulating around a centre.

Simplistically put, the centripetal forces 'pull' the object radically-inwards towards the centre of the circle while the centrifugal forces are a reactive, equal and opposite effect 'pulling' the object outwards, together sustaining the circular motion (Signell, 2002).

In Bakhtin's construct, utterances, languages and cultures can be understood as being in motion, constantly being pulled in different directions. Explaining the fluid nature of language in *Discourse in the Novel*, Bakhtin (1981) introduces the concept of centripetal forces:

> Unitary language constitutes the theoretical expression of the historical processes of linguistic unification and centralization, an expression of the centripetal forces of language. A unitary language is not something given [dan] but is always in essence posited [zadan] – and at every moment of its linguistic life it is opposed to the realities of heteroglossia. But at the same time it makes its real presence felt as a force for overcoming this heteroglossia, imposing specific limits to it, guaranteeing a certain maximum of mutual understanding and crystalizing into a real although still relative, unity – the unity of the reigning conversational (everyday) and literary language, 'correct language.' (Bakhtin, 1981, p. 270)

For Bakhtin, unity is not natural or given. On the contrary, it is perceived and 'felt'. Centripetal forces strive to construct unity and centralisation, representing efforts to control or overcome the actual complexity by, for instance, positing a 'correct language' (Bakhtin, 1981, p. 270), 'the one language of truth', 'the idea of a universal grammar', 'a unitary language' (Bakhtin, 1981, p. 271) etc. But these centripetal forces operate 'in the midst of heteroglossia'; they are opposed by the natural, uninterrupted centrifugal forces:

> Alongside the centripetal forces, the centrifugal forces of language carry on their uninterrupted work; alongside verbal-ideological centralization and unification, the uninterrupted processes of decentralization and disunification go forward. Every concrete utterance of a speaking subject serves as a point where centrifugal as well as centripetal forces are brought to bear. The processes of centralization and decentralization, of unification and disunification, intersect in the utterance. (Bakhtin, 1981, p. 272)

To sum up, centripetal forces strive for unification and centralisation while centrifugal forces continually decentralise and de-unify. Centrifugality is given and manifests the realities of heteroglossia in unfinalisable flux, while centripetality is 'felt' and posited as a force for overcoming this complexity. Thus, every utterance, language or culture is a 'contradiction-ridden, tension-filled unity of two embattled tendencies' (Bakhtin, 1981, p. 272). Following poststructuralist readings of Bakhtin, we can look for centripetal

forces as centralising, dominating positions and centrifugal forces as decentralising, marginal positions.[18]

Another concept considered by Bakhtin also relates to the double- or poly-sided nature of things, namely, 'ambiguity', which proves to be highly relevant for my interpretation of positional emergence. Bakhtin (1984) reflects upon ambiguity in his exploration of works by literary writer Fjodor Dostojevski in *Problems of Dostoevsky's Poetics*. He describes Dostojevski's approach as 'polyphonic' and characterises the ability of Dostojevski as follows:

> Where others saw a single thought, he was able to find and feel out two thoughts, a bifurcation; where others saw a single quality, he discovered in it the presence of a second and contradictory quality. Everything that seemed simple became, in his world, complex and multi-structured. In every voice he could hear two contending voices, in every expression a crack, and the readiness to go over immediately to another contradictory expression; in every gesture he detected confidence and lack of confidence simultaneously; he perceived the profound ambiguity, even multiple ambiguity, of every phenomenon. (Bakhtin, 1984, p. 30)

Dostojevski's polyphonic approach showcases the ambiguity – or even 'multiple ambiguity' – that is indeed essential in the ontology of Bakhtin. For Bakhtin, Dostojevski exemplifies the unfinalisable and changing nature of things in his characters. Thus, Bakhtin (1984) describes ambiguity as 'characteristic for all Dostoevsky's heroes' (p. 150). In his works, we find the ambiguity 'laid bare and emphasized' (Bakhtin, 1984, p. 150) in 'ambivalent and crisis-ridden characters, unfinalised, eccentric, full of unexpected possibilities' (Bakhtin, 1984, p. 172). For instance, they adhere to the role of 'the 'wise fool' and 'the tragic clown' (Bakhtin, 1984, p. 150). As Dostoevsky himself writes about one of his characters, Alexei Ivanovich, in a letter from 1863:

> I am taking a direct spontaneous nature, a man however of considerable development, but in everything incomplete, a man who has lost faith and yet who does not dare not to believe, who rebels against the authorities while fearing them. (Dostoevsky in Bakhtin, 1984, p. 171)

The character of Alexei Ivanovich is unfinalised, emerging in a 'consistent and crucial open-endedness' (Bakhtin, 1984, p. 172), resisting a simple, singular interpretation. As Bakhtin states:

---

[18] E.g. see Baxter (2011): 'In distinguishing centripetal and centrifugal, Bakhtin suggested that some discourses are centered whereas others are marginalized (p. 122) and 'Centripetal discourses, by definition, are more powerful than centrifugal discourses because their systems of meaning are centered or legitimated as social reality' (p. 129).

In Dostoevsky's world all people and all things must know one another and know about one another, must enter into contact, come together face to face and begin to talk with one another. Everything must be reflected in everything else, all things must illuminate one another dialogically. (Bakhtin, 1984, p. 177)

Similar to centripetal/centrifugal forces, ambiguity points to the multiple, complex and unfinalisable nature of things in the processual ontology of Bakhtin. Thus, everything is related and in these relations, all things emerge. Even though highly abstract, the concepts of centripetal/centrifugal forces and ambiguity can help to illuminate positional emergence in collaborative design, as will be exemplified in Chapter 5.

Interpreting artifactual emergence: Introducing boundary objects and boundary negotiating artifacts

The concept of object is another fundamental pillar in Mead's scheme of analysis. Human beings live in a world or environment of objects, and their activities are formed around objects [...] To identify and understand the life of a group it is necessary to identify its world of objects. (Blumer, 1966, p. 539-540).

Bakhtin's concepts are primarily of linguistic, discursive affiliation. With the following set of concepts, my goal is to add materiality to the interpretational scheme. Thus, besides having an interest in positional emergence, I also seek to explore the artifactual emergence of digital museum communication. For this purpose, I build on important developments of Strauss' (2010) social worlds framework, namely, 'boundary objects' and 'boundary negotiating artifacts'. Together with Griesemer, Star (like Clarke, a student of Strauss) develops the concept of boundary objects to understand how actors from different social worlds form their collaborative activities around objects in the boundaries between worlds. In this context, a boundary means 'a shared space' and boundary objects serve as a 'shared structure' (Star, 2010, p. 602-603) that is, however, flexible. As Star and Griesemer write:

Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds. (Star & Griesemer, 1989, p. 393)

Star and Griesemer (1989) derive the concept on the basis of historical research into how a natural history museum was developed in interactions between several groups of actors – 'amateurs, professionals, animals, bureaucrats and 'mercenaries'' (p. 392). They find four types of boundary objects used to create and maintain coherence across these groups, namely:

1) Repositories: ordered piles of objects where actors from different social worlds can use or borrow from the pile in different ways, such as a library.

2) Ideal type: abstract or vague objects that are adaptable and specified differently in different social worlds, for instance, a diagram.

3) Coincident boundaries: common objects with the same boundaries but with different content within them ascribed by different social worlds, such as a nation state.

4) Standardised forms: standardised objects used to communicate information from one social world to another, for instance, a form.

Since Star and Griesemer suggested these different boundary objects, the concept has been used and developed extensively across diverse research disciplines (see Star, (2010) and Lee (2004, 2007a)). I find one development particularly relevant for my work, namely, Lee's (2007a, 2004) suggestion to supplement boundary object theory with another set of concepts: Boundary negotiating artifacts.

Like Star & Griesemer, Lee studies internal work at a natural history museum, focusing on an interdisciplinary team designing a large museum exhibition. However, Lee argues, her situation is very different from that of Star and Griesemer. While Star and Griesemer are mostly interested in methods of standardisation and how objects can maintain and routinise collaboration in spite of heterogeneity, Lee is interested in non-routine, novel collaborations without established standards. The boundary negotiating artifacts suggested by Lee (2007a) are used for negotiating and pushing boundaries between different social worlds or communities of practice, not for merely maintaining and 'sailing across' boundaries (p. 307). In her case study, she finds five types of boundary negotiating artifacts:

1) Self-explanation artifacts: artifacts created and used privately to learn, record, organise, remember and reflect, sometimes indirectly presented to others through inclusion artifacts or compilation artifacts, for instance, notes, tables or concept sketches.

2) Inclusion artifacts: artifacts used to propose new concepts and forms originating in one community of practice and proposed to others, for instance, in the form of sketches or texts.

3) Compilation artifacts: artifacts used to coordinate media and understanding across different groups, such as tables or technical sketches.

4) Structuring artifacts: artifacts used to establish ordering principles and tenor in narrative forms as well as to direct and coordinate activities of others, for instance, exhibition narratives and exhibition concept maps.

5) Borrowing artifacts: artifacts such as all of the above-mentioned examples borrowed from one community of practice and used in unanticipated ways in others, for instance, to augment understanding of design problems.

All of these different artifacts can be used to push boundaries in terms of their ability to, for instance, 'record, organize, explore and share ideas; introduce concepts and techniques; create alliances; create a venue for the exchange of information; augment brokering activities; and create shared understanding about specific design problems' (Lee, 2007a, p. 333). While Lee suggests that there may be a connection between boundary negotiating artifacts and boundary objects, she does not explore this connection further. As she states:

> Further research might pursue comparative case studies to explore more fully the relationship, or lack thereof, between boundary objects and boundary negotiating artifacts. The concept of boundary objects is important and is deserving of more research, but we must also push past assumptions of standardization and stable boundaries between communities on which the concept lies. Perhaps boundary negotiating is part of a process by which methods are developed and become standardized. Or perhaps, even more intriguingly, future work may find that boundary negotiating is an alternative form of collaborative work that is advantageous for certain types of circumstances (e.g. short term or highly innovative projects). (Lee, 2007a, pp. 335-336)

I return to some of these intriguing thoughts in the second part of the analysis (Chapter 5) where I identify boundary negotiating artifacts in my data material. Further, I propose a new kind of artifact and try to understand how these artifacts are related to the emerging digital museum communication of which the 'final' solution has striking boundary object characteristics.

2.4. SUMMARY

In the present chapter, we have messily jumped around in and between different time periods, diverse fields of study and a wide array of concepts, frameworks and discussions. All of this jumping around has had one overall purpose, namely, to establish a foundation for exploring the research question posed: How does digital museum communication emerge in collaborative design interaction between museum staff and digital designers?

The first third of the chapter was concerned with explaining the rationale behind posing such a question, critiquing simplistic, deterministic technology treatments in the museum literature and Danish cultural policy discourse and positioning my work within a practice turn in museum studies. The second third exposed and categorised the limited, existing museum literature of relevance, paralleling the three sub-research questions about involvement, understanding, negotiation and co-design. The last third introduced theories and approaches upon which I build to explore the research question and add to the limited existing literature. In particular, I outlined my alignment with a symbolic interactionist approach to STS, situational analysis and theoretical perspectives that are useful for exploring emergence and temporal complexity.

Before we get to the analysis and the operationalisation of these theories and approaches, the concrete methods used and expanded need to be further explained in the methods chapter.

3

METHODS

We shall not cease from exploration,
And the end of all our exploring,
Will be to arrive where we started,
And know the place for the first time.

(Eliot, 1943, p. 59)

There is, in sum, a rather intractable unpredictability associated with ethnographic studies. Templates can be bent, stretched, and combined in a variety of ways. Where the research will lead is often up in the air throughout a fieldwork stay and beyond.

(Van Maanen, 2001, p. 253)

I prelude the methods chapter with these reflections by poet T.S. Eliot and ethnographer John Van Maanen to recall what I already touched on in the initial pages of the thesis. As expressed in both quotations, there is a certain unpredictability of exploration. Over time, we gain new insights about what we thought we knew and what we wanted to know, and we end up in unforeseen and unexpected places. The fluid and emergent character of exploration can be utterly challenging to deal with, yet extremely rewarding. Indeed, navigating within the consequential uncertainty has been the biggest methodological test and effort for me: to live with not knowing the end of the story was as thrilling as it was nerve-racking.

My navigation towards 'the end' – this thesis – was guided by many methodological choices. These choices were continually influenced by what I learned about the research focus theoretically as well as empirically. In the current chapter, I explain and reflect on the choices, the chosen approaches

and the consequences of these choices. My overall goal is to make the research process transparent and showcase coherence between the choices made.

The nature of the choices runs within a spectrum from being very abstract to being very concrete; from choosing 'a basic set of beliefs that guide action' (Guba, 1990, p. 17) to choosing concrete research methods such as observation and interviews (Creswell, 2009). In this chapter, I first sketch the abstract, what I call the mind-set guiding the research. I then go into the more concrete circumstances in terms of planning the research, generating the data and analysing the data.[19] Lastly, I reflect on particularly relevant dangers and limitations of the research.

3.1 ESTABLISHING A MIND-SET & THE CASES STUDIED

3.1.1. An exploratory, ethnographic & processual mind-set

> The flexibility of exploratory procedure does not mean that there is no direction to the inquiry; it means that the focus is originally broad but becomes progressively sharpened as the inquiry proceeds. The purpose of exploratory investigation is to move toward a clearer understanding of how one's problem is to be posed, to learn what are the appropriate data, to develop ideas of what are significant lines of relation, and to evolve one's conceptual tools in the light of what one is learning about the area of life. In this respect it differs from the somewhat pretentious posture of the research scholar who under established scientific protocol is required in advance of his study to present a fixed and clearly structured problem, to know what kinds of data he is to collect, to have and hold a prearranged set of techniques, and to shape his findings by previously established categories. (Blumer, 1969, pp. 40-41)

During my past three years in the research world, I have often heard exploratory procedures critiqued for being without direction and theoretical basis. On the contrary, my experience is that a great deal of direction is needed in line with Blumer's views in the quotation above. Instead of setting out on a clear mission, directionality has a dynamic character in exploratory research since the whole point is to learn and to be in a state of 'constant readiness to test and recast one's view and images of the area' (Blumer, 1969, p. 40). Having this interest, I am inspired by a constructivist paradigm (Denzin & Lincoln, 2011), particularly interactionism, in which human

---

[19] Of course, all of these choices are interrelated and evolve iteratively (Miles & Huberman, 1994, p. 12), but for presentational reasons, I distinguish between them.

group life and interaction in naturalistic settings is considered a core element of scientific investigation of how organisations, institutions and other relations are constituted (Blumer, 1969, p. 49). This type of research made sense for me because the relations between museum staff and digital designers were rather unexplored. There was not much previous research to build on, and from the outset, I was therefore very concerned with what happened in the empirical world instead of grounding my research on findings from other related research fields.

Ethnographic approaches served me well in pursuing this concern. The definition of ethnography has been much discussed in recent decades in alignment with an increased use of ethnography within diverse research disciplines (Gobo, 2011; Hammersley, 2006). Ethnography is often framed in relation to the method of doing observation, but it can also be viewed as a philosophical paradigm (Gobo, 2011), a broader approach that brings 'together whichever methods seem appropriate to try to understand the social life and cultural assumptions of those being studied' (Macdonald, 2001, p. 78). My mind-set is very much in accordance with such an ethnographic paradigm where a basic, underlying assumption is that it takes first-hand, empirical encounters and thorough exploration in natural settings to understand the world (Blomberg, Burrell, & Guest, 2003; Hammersley, 2006).

Importantly, I do not consider my work to be a classic ethnographic study, particularly because I did not holistically engage in the daily lives of the people studied. Instead, my observations could be seen as 'part-time' (Hammersley, 2006, p. 4) because I focused on a particular social phenomenon when it was in play, namely, collaborative design interaction. This rather intense focus on the social, positions my mind-set within what some call 'sociological ethnography' (Hammersley, 2006; Nadai & Maeder, 2005). Sociological ethnography has roots in 'Chicago School' sociology where ethnography was developed within sociological studies (Gobo, 2011). Blumer, whose views on exploratory procedures opened this section, was one of the central figures in this wave. Also, Strauss is associated with the Chicago School, as is his development of grounded theory in collaboration with Glaser (Glaser & Strauss, 1967). In the literature and theory chapter, I outlined Clarke's connection to Blumer and Strauss, and situational analysis can indeed be argued to have ties to this tradition of doing ethnography in sociological studies.

The guiding mind-set is also related to my interest in temporality and process. In pursuing emergence, I view change, dynamism, continuity, unfinalisability and similar phenomena as having primacy over stability and structure. I assume the world to be in flux, a flux that cannot fully be pinned

down and understood. However, I see it as important to continually develop methods and theories that *better* explain flux even if these methods and theories can never be perfected (that would of course only be possible if the world was stable). Also, as I have already noted in the introduction, this worldview inspires me to – as a 'bricoleur' or 'quilt maker' (Denzin & Lincoln, 2011, p. 4) – look for relations between different research disciplines, approaches and theories. Even though it might not be comfortable to reside in the border zones of imperfection, between scientific trends and disciplines, there is indeed a need for it (Frodeman, 2010, p. xxxv). As Bakhtin notes, scientific flux is natural and to seek out interrelations between demarcated trends and disciplines can be highly beneficial:

> Not a single scientific trend (that has not been the work of charlatans) has [illegible] totally, and not one scientific trend has remained in its initial and immutable form. There has not been a single scientific age when only one trend existed (but there has almost always been one dominant trend). This is not a question of mere eclecticism: the merging of all trends into one and only one would be fatal to science (if science were mortal). The more demarcation the better, but benevolent demarcation. Without border disputes. Cooperation. The existence of border zones (new trends and disciplines usually originate in them). (Bakhtin, 1986, p. 136-7)

3.1.2. Introducing the cases

Having established that the research is basically guided by an exploratory, ethnographic and processual mind-set, it is time to be more specific about the cases central to the research. My initial description of the research project was very broad and contained several interesting leads that could be pursued. I did, however, have a clear idea about the significance of the cases and my interaction with them. In my application for the research position from December 2012, I wrote that I wanted to 'do field work in a range of development projects' with the goal of:

> ...gaining knowledge about what concretely takes place in collaborations between museums and external companies, spoken and unspoken, by observing meetings, gaining access to records, contracts and plans, interviewing participants and the like.

After spending some time researching and exploring different options in terms of which primary cases to follow, I originally planned to follow three cases. Two of these cases proved to be either not sufficiently advanced in terms of initiating their work or too difficult to access. Also, I quickly realised that it would not have been possible to simultaneously follow three cases

with the same level of intensity – following two cases was barely possible. The Cultural Heritage Case was the only originally planned case that 'survived' in my refined research design. In addition to this case, I was quite lucky to encounter the Art Case. I heard about the Art Case in the first week of my PhD employment since my research centre, DREAM (Danish Research Centre on Education and Advanced Media Materials), was originally involved in it. I thus had easy access to the case, and I participated in the first meeting during my very first week as a PhD student.

The two cases turned out to supplement each other extremely well. I will explain this more carefully after the next section. To do that, however, an introduction to the cases is needed. This introduction is my first attempt at unfolding the cases by means of a historical sketching of them as well as my interrelation with them. To ensure anonymity of the cases and their participants, pseudonyms are used (see more about the choice of anonymising the cases and the participants in section 3.4). Appendix 1 contains an overview of the participants, displaying departmental or professional affiliations and work titles. Additionally, Appendix 2 gives a simple data overview by displaying major events occurring. When I cite data, I end the citation with the date of the event from which the data origins (noted as month/day/year, e.g. 091613). The data overview in Appendix 2 is structured in accordance to these dates. All data cited has been idiomatically translated from Danish (my translation).

The Art Case

The Art Case took place at a Danish art museum. The head of education at the museum, Emma, initiated the case after a conversation with the CEO from a digital design company, Henry, at a seminar on collaboration between museums and small- and medium-sized enterprises. The digital design company had developed a new exhibition technology in collaboration with another museum. The company was interested in developing it further and suggested that it be done in collaboration with the art museum. As Emma put it:

> Emma: We work very experimentally and we're interested in trying new things, as are they. So they contacted us because they had a new technology they wanted to work with. And on that basis, we then made the application for funding. (Interview, 091613)

In Denmark, museums typically need funding to be able to initiate the development of digital museum communication. Emma therefore applied for funding and the project was funded by public means in a way that

allowed experimentation, thus consisting of three design cycles following each other. As Emma told me in an interview:

> Emma: Originally, the aim was to develop a digital communication product for mobile devices, and in the project description, we constructed it as an iterative process resulting in three apps where the last one was the culmination of the previous two. In short, we were to experiment quite a lot and then make a product that others could hopefully adopt and use. (Interview, 091613)

More concretely, the goal was to develop three mobile apps (applications) using technologies such as AR (augmented reality) and pattern recognition: one for a temporary exhibition, one for another temporary exhibition and one for a permanent exhibition. The vision behind the project was, as formulated in the application for funding, 'to revolutionize the exhibition communication by replacing other media, for instance, screens, wall texts and pamphlets' and 'to expand the quality of both the off-site and on-site experience that will increase the accessibility to the museum'.

In the thesis, the three design cycles are called the Sun Project, the Moon Project and the Stars Project. These are pseudonyms aimed at protecting the anonymity of the case and the participants. To ensure this anonymity, the names of the case and the participants have absolutely no relation to the actual case, exhibition content of the museum, work approach or the like. On the contrary, I choose them exclusively to underscore the temporal progress and to assist the reader in keeping track on the temporality. Thus, we first see the sun, then the moon and lastly the stars.

The Sun Project lasted approximately two months, the Moon Project approximately four months and the Stars Project approximately eleven months. The Sun Project and the Moon Project were quite intensive as their respective apps (the Sun App and the Moon App) needed to be finalised before the two temporary exhibitions opened. The Stars Project was more flexible because the Stars App was for the permanent exhibition. There were periods of lower activity in this process, and the project period was extended with approximately eight months compared to the original outline.

To conclude, the Art Case provided me with three examples of collaborative design of digital museum communication. The longitudinal and experimental character of the case entailed a unique setting for the participants to continuously reflect on and refine their collaboration, moving from the Sun Project, to the Moon Project and finally to the Stars Project.

The Cultural Heritage Case

While the goal in the Art Case was to develop digital museum communication, the goal in the Cultural Heritage Case was to build a new museum at a cultural heritage site to replace an existing museum. As summarised in a project description from August 2011, the aim was to develop: 'An international experience and knowledge centre founded on the fascinating history and extraordinary cultural value of the site'. Developing digital museum communication was therefore not the primary focus, but it was considered important to integrate thoughts on digital possibilities from the outset of developing ideas and structural requirements for the new exhibitions. As the project manager, Alex, said several times, the museum should be built 'from the inside out', focusing on contents and exhibitions before architecture. He therefore prioritised the inclusion of as many relevant areas of expertise in the early design phases as possible, including expertise on digital museum communication.

Alex was hired just a month before I began my PhD work. The case was initiated years before, but was stymied by various complications and hiring the project manager was therefore seen as a new start. The project management was not based within the existing museum but within the civil service of the municipality in which the cultural heritage site and the existing museum were geographically positioned. The municipality sponsored a part of the budget, but a significant amount of external funding was also needed.

Developing ideas and structural requirements for the new exhibitions was only one of Alex's responsibilities. As project manager, he was also concerned with economic, organisational and communicational aspects on a larger scale. I was invited to gain an insight on all of these matters, but for the sake of data manageability, I generally tried to focus on the exhibition ideation. To do so, I followed two projects of specific interest quite intensively. In between these projects, I followed the case from a distance by regularly telephoning and talking to Alex. In total, I followed the case for approximately 21 months.

Throughout the thesis, I call the two projects, which I followed intensively, the Dawn Project and the Dusk Project. As in the Art Case, these are pseudonyms that in no way refer to the actual case, thus ensuring anonymity of the case and the participants. The idea is to draw attention to the process and help the reader develop a temporal understanding. To create coherence, I use terminology related to the pseudonyms of the Art Case. Thus, the sun rises in dawn and sets in dusk, leaving us with the moon and stars on the sky. The first project is therefore called the Dawn Project while the second is called the Dusk Project.

In the Dawn Project, Alex initiated what he called a prospectus group. He invited a carefully selected group of people to take part: different creative companies and individuals, museum educators, archaeologists and other individuals with relevant expertise participated in this process, including staff from a digital design company. The goal of the group was to develop ideas and concepts about the purpose and exhibition content of the new museum. These ideas and concepts were then gathered in a prospectus that was intended to 'convince contributors and funds to support the realisation', as Alex formulated it in an e-mail sent out before the first meeting in the Dawn Project (062512a). The group worked together for approximately four months, after which a few of the members (the project manager; in the beginning, the process facilitator; and, later, the project manager assistant) produced the prospectus.

Later on, Alex initiated the Dusk Project which was set up to develop more concrete exhibition guidelines to be used as a foundation for an architecture competition. In this process, lasting approximately six months, museum staff were the primary participants. At this point, another museum had become a partner in the project, and staff from this museum, called the partnering museum, participated in the project. From the outset, the group had interesting discussions on whether to involve digital designers in the group or not. In the end, digital designers were not directly involved in the group. However, inputs on digital possibilities were gathered in a more informal manner. Hence, the Cultural Heritage Case provided me with two examples of collaborative design of museum exhibitions in which digital expertise was involved in very different ways.

In sum, I frame the Art Case as consisting of three projects of collaborative design of digital museum communication and the Cultural Heritage Case as consisting of two projects of collaborative design of museum exhibitions. All of these projects provide insights about the way in which digital designers are involved in museum exhibition design. Moreover, they all point to challenges in relation to establishing and performing collaborative design between museum staff and digital designers. Further, the Art Case gives me the opportunity to go deeper into how digital museum communication is negotiated and co-designed across organisational divides and differing practices and values.

The supplementary cases

Besides following the two cases, I interviewed four people of particular relevance to the arguments I pose in the thesis. Firstly, I interviewed Camilla from a public organisation that supports collaboration between museums

and digital design companies. Secondly, I interviewed Rebecca, Matt and Luke from two cases that are similar to the Cultural Heritage Case, though much further in the process. In both of these cases, new museums were being built and were just about to be opened to the public at the time of the interviews. The interviews took place rather late in the process to further investigate insights from the primary cases. I will more carefully introduce these cases in the first part of the analysis (Chapter 4).

3.1.3. Selecting the cases

The choice to focus on the two primary cases was guided by the following three considerations inspired by sociologist Michael Quinn Patton's (1990) insights on sampling strategy:

Firstly, the cases are *information-rich* in relation to collaborative design processes between museum staff and digital designers, thus securing the exploration of central issues in terms of the purpose of the research.

Secondly, the Art Case and the Cultural Heritage Case *vary maximally* in many regards. According to Patton (1990), the strength of maximum variation sampling is that any common patterns emerging across differing cases are of particular value in characterising the phenomenon under study. Thus, it amplifies a generalisation despite a small number of cases.

The two cases differ mainly in relation to three issues: 1) the objects they are concerned with, 2) the role of digital museum communication and 3) the kind of ideation taking place:

1) Following professor of museology and anthropology George Ellis Burcaw (1997), a museum can be defined in terms of what kinds of objects it collects. Burcaw (1997) distinguishes between two kinds of objects: unique 'works of art' versus other objects that are 'valued not in themselves but as examples of the natural world and of human cultures' (p. 37). On this basis, Burcaw argues for a divide between art museums and other kinds of museums. Thus, by choosing cases in relation to an art museum and a cultural heritage museum, the cases vary maximally in terms of the objects they are concerned with.

2) Also, the cases vary maximally in terms of the role of digital museum communication. The primary aim in the Art Case is to develop digital museum communication while that in the Cultural Heritage Case is to develop a new museum where digital museum

communication is one among many exhibition techniques discussed. Therefore, the two cases manifest a spectrum between the development of technologies as an add-on to an already existing museum or exhibition and as integrated in the museum as part of its basic formation.

3) This point is also related to a third maximal variation between the two cases, namely, the kind of ideation taking place. While the Art Case consists of three full development projects including constructional phases, the projects in the Cultural Heritage Case do not move into actual construction due to the much larger setup. The funding needed for construction is raised and received in the Art Case in contrast to the Cultural Heritage Case. Also, as specified earlier, a significant amount of money is needed in this case. Thus, the character of the ideation in the two cases is dissimilar. The ideation in the Cultural Heritage Case tends to be very explorative and open-ended while that in the art museum case is more concrete because of the apparent need to specify for the purpose of construction. Even though I focus primarily on the ideation in the in-depth analysis of the Art Case in the second part of the analysis, Chapter 5, many of the interesting negotiations take place because of and in relation to the following construction processes.

Throughout my PhD work, people have questioned the sense of selecting very divergent cases, and I must admit that comparing them has posed a challenge for me. However, I have found it important to do so in line with what organisation scholars Andrew H. Van de Ven and Marshall Scott Poole have noted:

> Critics have questioned the wisdom of this heterogeneous sampling of innovations, for it may result in 'trying to compare apples with oranges.' Our response is that we will never know the limits where valid comparisons end and where invalid comparisons begin unless we empirically examine the broadest possible range of cases to which our definition of innovation applies. (Van de Ven & Poole, 1990, p. 316)

I have at times had concerns about how to make such a valid comparison, especially in the initial phases of the PhD process. Yet, after careful scrutiny of the 'apples and oranges', the comparison proved to be meaningful. I return to this comparison in the first part of the analysis (Chapter 4).

Comparisons between maximally varying cases, however, did not work exclusively in answering the research questions. To explore the negotiation and co-design of digital museum communication, I needed to focus on the

Art Case where technology was naturally much more negotiated than in the Cultural Heritage Case.

This difference leads us to the third consideration in the case selection. The Art Case is what can be characterised as an *intensive and critical case* (Patton, 1990). It is an intensive case because it centres exclusively on digital museum communication. It also adheres to what Patton designates a critical case since it is particularly important to the research subject. As Patton (1990) explains, one might say that; 'if that group is having problems, then we can be sure that all the groups are having problems' (p. 174). In that sense, it is possible to make generalisations even though only one single case or a few cases are being studied (Patton, 1990). The Art Case is a critical case for two reasons:

1. The participants in the case receive funding to develop three solutions. As such, three different design processes take place and the participants have a chance to continually develop their collaboration based on their on-going experiences.

2. A broker participates in the case. The participant referred to as Julia in the thesis lives up to the definition of a broker. Besides being employed by the design company, she has experience working in a museum and has conducted research about museums. As other studies have shown, brokers are particularly good at bridging difference and ensuring collaborative activities (e.g., Clay, Latchem, Parry, & Ratnaraja, 2014; Sonnenwald, 1996; Søndergaard & Veirum, 2012; Wenger, 1998).

These two aspects propelled me to view the case as critical, thus enabling me to argue for generalisation to some degree. I engage with this opportunity in the second analysis chapter where, as mentioned above, the focus is on the negotiations and co-design of digital museum communication in the Art Case.

To sum up, I have selected the Art Case and the Cultural Heritage Case as primary cases because they supplement each other well in terms of varying maximally and being information-rich in different ways. Furthermore, I selected the Art Case because it was an intensive and critical case, allowing detailed scrutiny of the phenomenon under study. In addition, I conducted interviews in three supplementary cases. These cases function as *confirming cases* since they are additional examples that confirm the patterns unravelled in the primary cases, albeit with variations (Patton, 1990). I will clarify the rationale for conducting these supplementary interviews later on when

relevant. For now, we turn our attention towards how I more concretely constructed and interacted with the primary cases.

3.2. GENERATING THE DATA

3.2.1. Constructing the fields and the focus of study

In the above introduction to the cases and selection criteria, I clearly construct the cases in certain ways. As sociologists Eva Nadai and Christoph Maeder (2005) have noted, sociological ethnography has to deal with 'fuzzy fields' (p. 1), typically featuring multiple sites (Marcus, 1995), unclear boundaries and complex, emerging relations. Indeed, the selected cases are complex and non-routine (Strauss, 1988, p. 169), and framing the cases is therefore not an easy task but one that entails considerable simplification. It is, as Nadai and Maeder (2005) say, a construction performed by the researcher.

Anthropologist George Marcus (1998), who introduced the highly acclaimed notion of multi-sited ethnography, suggests six modes by which to construct the multi-sited space of ethnographic research. He proposes to either: follow the people; follow the thing; follow the metaphor; follow the plot, story, or allegory; follow the life or biography; or follow the conflict. In contrast, as suggested by Nadai & Maeder (2005), I have generally constructed and imagined the field more broadly in relation to social worlds constituted by a set of actors focused on a common concern. Thus, this construction circulates the interaction between social worlds of museums and digital design companies, particularly in relation to their interaction in co-designing digital museum communication.

Following this collaborative design interaction, however, proved to be quite challenging. As design researchers Janet Mcdonnell and Peter Lloyd have so eloquently expressed:

> The nature of design in practice means that even small projects take place in many different environments among a shifting set of participants. Designing occurs in many, often simultaneous, interactions, and is spread out over time and space. Designers work at computers, talk to other designers and clients, often solve problems away from formal workplaces, and are subject to many external influences which have critical implications for what they can do. Information is often forgotten or thrown away, and designers often work on a number of different design projects at any one time. (McDonnell & Lloyd, 2009, p. 3)

To cope with this messiness, I found inspiration in perspectives from organisation studies on how to follow processes. Organisation scholar Andrew W. Pettigrew (1997) suggests conceptualising a process as 'a sequence of individual and collective events, actions, and activities unfolding over time in context' (p. 338). Further, organisation researcher Ann Langley (1999) has described process data as consisting of 'events, activities, and choices ordered over time' (p. 692). Due to my research interest, I focused primarily on the occurrence of collective events, actions, activities and choices taking place in the idea and concept development phases. To explore these occurrences, I chose to use the classical 'big three' of qualitative research (Bizzi & Langley, 2012, p. 229): a triangulation[20] between doing observation, interviewing and gathering documents and other materials. I present my take on the classical methods in the following sections.

3.2.2. Methods for generating data

Observation

The aim of doing observation is to understand human behaviour as it naturally occurs and to get insights into so-called tacit knowledge, knowledge that is not necessarily understood by doing interviews or gathering documents and materials (Blomberg, Burrell, & Guest, 2003; D'Andrade, 1995). When doing observation, the researcher can act either as an observer-participant trying to be a mere observer, a fly on the wall so to speak, or as a participant-observer taking a more active part in the observed activities (Blomberg, Burrell, & Guest, 2003).

In following the activities in the two primary cases, I chose the role of observer-participant and only took an active part if I was specifically asked to do so. I chose this role to try to distance myself from the interaction between the participants and their potential conflicts. Even though I did of course influence the process in some way by mere physical presence and could not avoid developing sympathies for some participants or arguments at times, my overall aim was to observe what was happening between the interacting social worlds without getting too caught up in any of them.

The participants in the two cases interacted in various ways, but the actual meetings between them were a key place to observe collective events, actions, activities and choices being made. Four kinds of meetings were typical:

---

[20] I use the word 'triangulation' in a wide sense whereby the use of different methods is seen as a way to construct a greater understanding of what is studied (Denzin, 1970).

1) Meetings across organisational divides to explore and negotiate between museum staff and digital designers and/or other creative actors

2) Meetings within organisations to explore and negotiate internally

3) Workshops with potential users or other museum staff to get new perspectives on needs and use situations

4) Mediated meetings or conversations across organisational divides to discuss and/or negotiate issues of minor importance (telephone or Skype)

I observed the majority of these meetings. At the beginning of the meetings, I introduced myself and my research project and asked for permission to record the meetings on a sound recorder. I told the participants that their identity would be anonymised unless we later agreed otherwise. Only twice was I denied recording because of confidentiality issues (in the Cultural Heritage Case). I also considered video-recording the meetings but after testing that approach once, I rejected the idea because it turned out to be disturbing for the participants and not sufficiently beneficial in terms of the research focus.

Instead, my field notes proved to be a central tool for my data generation as well as the forthcoming analytical process. I almost constantly wrote field notes at the meetings to have a detailed recollection of my experience and to naturalise field note writing so the participants would feel that I constantly scribbled, regardless of what was said or what happened (inspired by Wolcott, 1994, p. 120). These field notes both displayed my notes about the interaction between the participants and my own thoughts about what happened, at times relating the occurrences to other cases and theoretical constructs. An example from my huge collection of field notes best illustrates my approach (Figure 5):
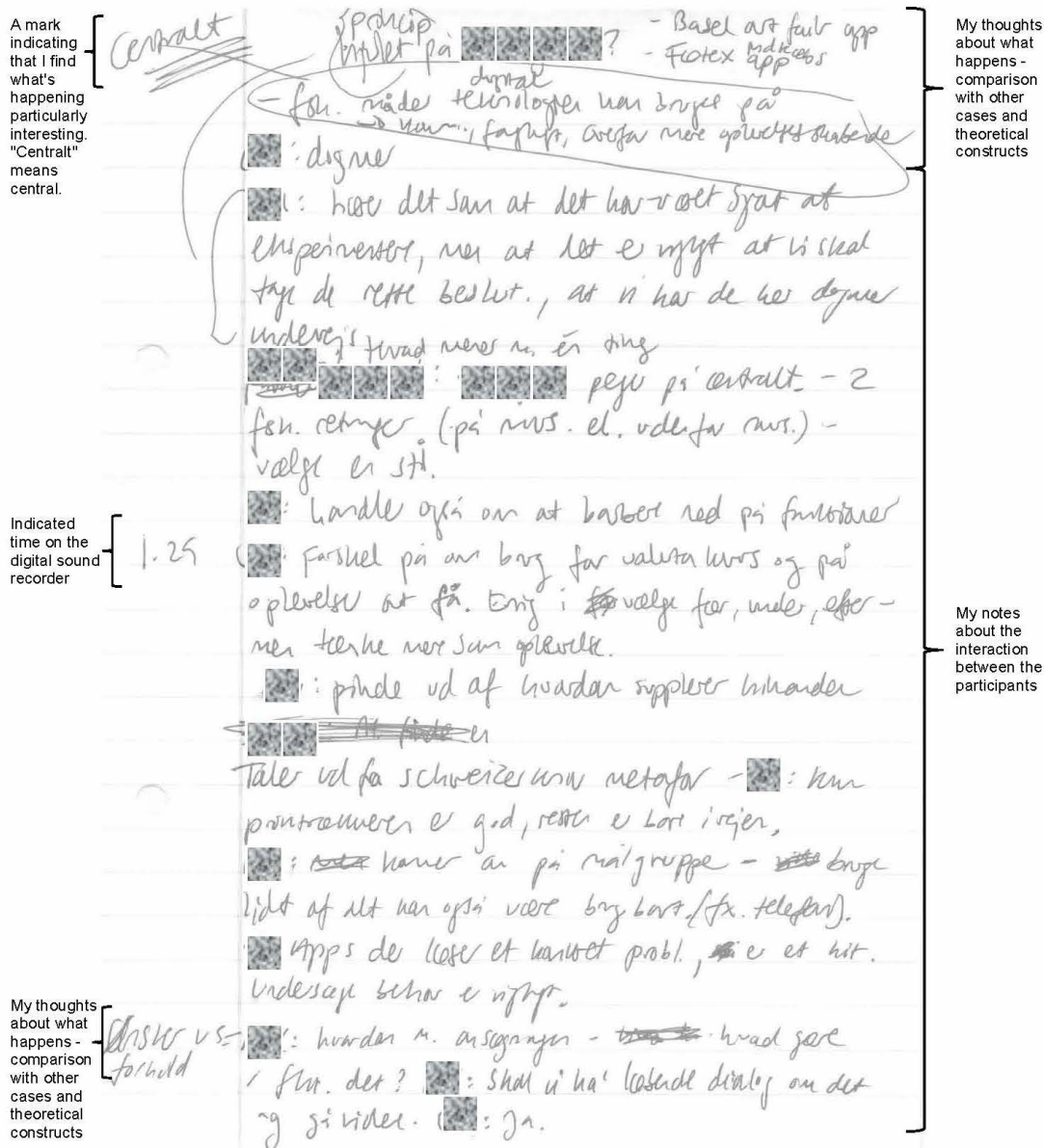
Figure 5: An example of field notes from the Art Case. The textured boxes hide the names of the cases and the participants for anonymisation purposes.

At times, I assessed that a meeting did not require my physical presence (e.g. Skype meetings and telephone meetings) or had minimum relevance (for instance, I did not participate in a meeting about managing a content management system in the construction phase of the Sun Project). I did however obtain documents and audio from some of these events. Also, playing the role of observer and not being an active participant sometimes meant that the participants forgot to invite me or inform me of changes in terms of, for instance, location or meeting times.[21] In line with this, it is

---

[21] To give an example: At one time, I discovered that three participants in the Art Case informally met to discuss the project without notifying me. We all participated in a museum conference, and they

important to clarify that I do not consider the data material to be complete. Many events, actions, activities and choices unfolded in the process, and what I observed was only part of it. Instead, I prefer to see the data material gathered as a 'sample of indicators of what happened over time', as expressed by Van de Ven & Poole (1990, p. 323).

Interview

To supplement the observations and strengthen the sample of indicators, I interviewed selected participants in the two cases.

In the Art Case, I did seven interviews. After the concept was developed in each of the three projects (the Sun Project, the Moon Project and the Stars Project) I interviewed selected participants about their experience of the project and their thoughts on future work. I conducted three interviews with one participant from the museum, the head of education, Emma, and three group interviews with two participants from the design company, the creative director, Benjamin, and the strategic consultant, Julia (the broker). I selected these participants because they managed the project and were most involved. They participated in all three projects and were thus able to reflect on the entire process. Moreover, I wanted to get inputs from both organisations to hear from each side how they experienced the collaborative design interaction. Further, I conducted an interview with Emma after the last project, the Stars Project, was concluded. Emma had originally initiated the project and was my contact in the case. I conducted this concluding interview to inquire about whether she saw the project as fulfilling the initial goals as well as to construct an end point for my data generation.

In the Cultural Heritage Case, I conducted five interviews. Four of these interviews were about the Dawn Project and one was about the Dusk Project. In the Dawn Project, I interviewed the project manager, Alex, and the project facilitator, Louisa. As in the Art Case, I assumed that these participants would have a particularly interesting perspective in terms of the design interaction since they were responsible for managing and facilitating it. Further, I interviewed the interaction designer, Tobias, from the participating digital design company and the director of the existing museum, an archaeologist, Olivia. Again, I was interested in getting inputs

---

saw an opportunity to talk together over lunch. After I had eaten my lunch, I discovered them discussing a design sketch at the table right next to mine. They instantly apologised for not informing me about their meeting and invited me to join. At the time, I found it very frustrating, but in hindsight, I see how the event tells me something about the case as well as my role in it. Clearly, the participants were very busy and took whatever opportunity they had to discuss their work. Also, my role and interest were, I think, not always evident to them, something that I could have dedicated more effort into discussing with them. Luckily, such events happened very infrequently (to my knowledge).

from both types of organisations to hear from each side how they experienced the design interaction. In the Dawn Project, digital designers were not directly involved, so I decided to interview the project manager, Alex, exclusively. This interview also functioned as a concluding interview, getting Alex to reflect on the entire process and constructing an end point for my data generation.

All of the interviews were semi-structured (Kvale, 2007) and were based on what I experienced in my observations. I mostly constructed the interview guides in relation to five themes: Firstly, there was an introduction in which I presented the goal of and structure of the interview. I also clarified the names, job descriptions and affiliations of the participants, and I assured them that their identity would be anonymised unless we agreed otherwise. Secondly, I asked questions about the process and their methods. Thirdly, we talked about collaborative aspects, and fourthly, I asked them to reflect upon the result and future work. Lastly, I concluded the interviews with more concrete questions about the next steps, and I gave them the option to supplement with whatever reflections they might have about the project or the interview. The focus was generally on the actual projects, but I also encouraged the participants to compare these projects with previous positive and negative experiences of collaborative design interaction between museum staff and digital designers. The interviews were recorded on a sound recorder and were later transcribed.

Besides these semi-structured interviews, I had informal conversations with some of the participants. These conversations were not recorded, but I made notes afterwards. In addition, I discussed the preliminary results with my case contacts, the two project managers, Emma and Alex. During the process, I wrote two conference papers, one about both cases and one exclusively about the Art Case. The project managers read the papers and we discussed the results. The point of this exercise was to try to adhere to one of the merits of naturalistic study, namely, to ensure that it 'respects and stays close to the empirical domain' (Blumer, 1969, p. 46). Also, it gave me a nudge as to whether I was on the right track in terms of making a valid analysis (Dahler-Larsen, 2002, p. 779). In discussing the papers with the project managers, I got valuable inputs on how to refine my ongoing analytical work. They generally found my analyses to be interesting but worthy of more thorough investigation and presentation. This, for instance, motivated me to write a monographic thesis and not an article-based thesis, which was my original intention. I simply needed more space to unfold the analysis, an issue I return to in section 3.3.4 on the analytical process.

Materials

Throughout the cases, the participants constructed various textual and visual materials, and so did I. I constructed field notes, sound recordings, pictures and numerous maps (see more about these maps in the next section). The participants, for instance, constructed minutes, requirement specifications, plans, sketches, mock-ups, pictures, products and the like. I continuously gathered and structured all of these materials, including virtual interaction between participants. In between meetings, they primarily communicated by writing e-mails or messages to each other via mail programmes or other media. In the Art Case, they used a shared project platform where messages and materials could be distributed among all group members.

All in all, my exploration of the collaborative design interaction generated the following types of data: sound recordings of meetings and interviews, field notes of meetings and other related occurrences, pictures of participants and settings, maps and a wide array of textual, visual and/or physical materials constructed by and distributed among the participants. I ended up having more than a thousand pages of text and dozens of recordings and pictures to analyse.

3.3. ANALYSING THE DATA

> Process data are messy. (Langley, 1999, p. 692)

> Doing qualitative research is in many respects no different than doing everyday life: it is complex and sometimes downright chaotic. (Silverman, 2012, p. 14)

Following design interaction in two collaborative design processes for more than 1.5 years using the methods described generated an enormous amount of data. As messy as the design processes were, as messy or even messier were the data constructed from within them. Already before embarking on the PhD project, I was interested in how to work with such huge samples of messy qualitative data and I was particularly inspired by visual mapping techniques. Such techniques had proven useful to me in opening up and exploring process data as well as presenting them without significantly reducing their complexity. Particularly, situational analysis had caught my attention, and during the initial stages of the PhD project, I quickly decided

to work and experiment with the visual mapping techniques of situational analysis.

Below, I first outline the possibilities and pitfalls of visual mapping techniques more generally understood. I then present situational analysis and my use and expansion of the mapping techniques. Lastly, I go through my entire analytical process to more concretely showcase my use and expansion of these mapping techniques.

3.3.1 Possibilities and pitfalls of using visual mapping techniques

Before I delve into a description of my use and expansion of situational analysis, I will say a bit about the possibilities and pitfalls of using mapping techniques for data analysis advanced by researchers describing such methods prior to Clarke's (2003) outline of situational analysis. I do this with reference to sociologists Matthew B. Miles and Michael Huberman (1994) and evaluation researcher Peter Dahler-Larsen (2002) in relation to qualitative analysis in general, and with reference to Langley (1999) more specifically in relation to process data analysis.

Visual mapping techniques have been used extensively in quantitative research, for instance, under the rubric 'data visualization' (Tufte, 2001). However, their use in qualitative research has been more sporadic (Miles & Huberman, 1994). I have, on more than one occasions, watched the faces of qualitative researchers turn pale while looking at my maps (especially positional maps because of their apparent similarity to systems of coordinates). The maps reminded them of quantitative displays, and they questioned the rationale for using such approaches within a constructivist paradigm. Some instantly gave up understanding their logic and quickly turned the page to read my explanation of them instead. I therefore learned one of my first lessons on using visual mapping techniques: even though maps have to be somewhat self-explanatory, they cannot stand alone (Dahler-Larsen, 2002, p. 38; Langley, 1990, p. 702; Miles & Huberman, 1994, p. 100). Contrastingly, they must be supplemented with a thorough explanation and/or with narrative accounts.

Such textual explanations or narrative accounts usually stand alone in qualitative research. Indeed, Miles and Huberman criticise this typical display practice of qualitative research of using only 'extended text':

> Using only extended text, a researcher may find it easy to jump to hasty, partial, unfounded conclusions. Humans are not very powerful as processors of large amounts of information; our cognitive tendency is to reduce complex

information into selective and simplified gestalts or easily understood configurations. Or we drastically overweight vivid information, such as the exciting event that jumps out of page 124 of the field notes after a long, 'boring' passage. Pages 109 through 123 may suddenly have been collapsed, and the criteria for weighting and selecting may never be questioned. Extended text can overload humans' information-processing capabilities (Faust, 1982) and preys on their tendencies to find simplifying patterns. In the course of our work, we have become convinced that better displays are a major avenue to valid qualitative analysis. (Miles & Huberman, 1994, p. 11)

Instead, Miles and Huberman (1994) suggest the use of 'a visual format that presents information systematically' (Miles & Huberman, 1994, p. 91). They distinguish between two different overall types of formats: matrices that consist of rows and columns, and networks where different nodes or points are connected by lines. The strength of using such displays is that they, as data reduction devices, can increase the analytical power of the results and their readability. They permit a viewing of the data in one carefully organised location and enable the researcher to draw conclusions as well as further interpret data within and across cases. Thus, they increase the chances of drawing valid conclusions compared to extended text because they are coherently arranged to 'permit careful comparisons, detection of differences, noting of patterns and themes, seeing trends, and so on' (Miles & Huberman, 1994, p. 92). In line with this, displays should be seen as both analytical and presentational devices, as a method that can both help the researcher and the reader (Dahler-Larsen, 2002, p. 39; Miles & Huberman, 1994, p. 11).

Dahler-Larsen (2002) generally agrees with these points but uses more 'qualitative language' than Miles and Huberman (1994), such as 'bounding', 'condensing' and 'prioritizing' data (p. 34 and p. 106) rather than reducing or systemising them. Furthermore, he points to different rules of thumb when constructing displays: the rule of authenticity, the rule of inclusion and the rule of transparency. Firstly, the data used for making displays should be *authentic*, meaning that they should be used in their original form and not as recollected by the researcher. Secondly, all data relevant to the analytical focus should be *included* in the display. Thirdly, it should be *transparent* to the viewer how the display is constructed and it should not appear to be done in a random fashion (Dahler-Larsen, 2002, p. 39-45). According to Dahler-Larsen (2002), the worst-case scenario in terms of constructing displays occurs when data is forced into a senseless structure and their function becomes mechanical rather than explanatory. Similarly, Miles and Huberman (1994) stress the need to not 'bully the data' (p. 98) into superficial, unworkable or confusing formats or formats that do not incorporate all relevant data, which is related to the rule of inclusion proposed by Dahler-Larsen (2002).

According to Langley (1999), displays, or visual mapping techniques, are particularly attractive in process data analysis. Thus, they are very useful in displaying temporal aspects such as 'precedence, parallel processes, and the passage of time' (Langley, 1999, p. 700). Langley mentions the extensive use of process mapping in organisational practice and decision research and refers to works such as Meyer (1991), Mintzberg et al. (1976) and Nutt (1984). However, like Dahler-Larsen (2002) and Miles and Huberman (1994), she highlights the potentially mechanical and superficial quality of visual mapping techniques and argues for supporting such techniques with other methods to express and explore emotions, cognitions, interpretations and 'underlying forces' (Langley, 1999, p. 703) driving the processes studied. Also, and probably related to this, she frames the method as most useful in multi-case research (5-10 cases preferably), contrary to Miles and Huberman (1994).

3.3.2. The visual mapping techniques of situational analysis

As sketched out in the above section, main pitfalls of visual mapping techniques are their potential mechanical, superficial and 'bullying' character and their lack of ability to express and explore emotions, cognitions, interpretations and underlying forces driving processes. In choosing to work with situational analysis, I seek to advance mapping techniques and approaches in order to address, to some extent, these shortcomings.

The visual mapping techniques that Clarke (2005) develops in situational analysis are intended as a contribution to grounded theory by providing 'fresh ways' (p. xxii) into the data, dealing more fully with complexities inherent in postmodernist thinking, as explained in the literature and theory chapter. Particularly, she highlights their analytical possibilities and focuses less on presentational aspects: maps can help us see things differently, notice relations and continually rework/remap our conclusions. They can enhance reflexivity, open up knowledge spaces and are easier and quicker to move around in analytically compared to narrative text (Clarke, 2005, p. 30; Clarke & Keller, 2014). However, Clarke (2005) stresses the need for *continual* mappings of the situation throughout the research process. Thereby, her approach seeks to 'systematically' (Clarke, 2005, p. 85; Clarke & Keller, 2014) avoid mechanical, superficial and 'bullying' representations – to refer to the potential pitfalls of visual mapping techniques mentioned in the above section. Moreover, the types of maps she develops explore and express, to some degree, emotions, cognitions, interpretations and underlying forces driving processes.

As mentioned in the literature and theory chapter, Clarke develops three different mapping techniques that focuses on different analytical aspects: Firstly, *situational maps* focus on all elements in a situation (human, non-human, discursive etc.) and the relationship between them. Secondly, *social worlds/arenas maps* focus on the grouping and relations between various actors in a situation, mapped in terms of social worlds/arenas theory. Thirdly, *positional maps* focus on major concerns negotiated in a situation (Clarke, 2005). I will present these techniques more fully later on. For now, it suffices to say that I see Clarke's techniques as interesting ways of dealing with the potential challenges in relation to visual mapping techniques. Furthermore (and connected to this), her focus on complexities and constructivist notions cohere well with my mind-set and my focus on emergence in collaborative design interaction. However, in terms of emergence, I do have a couple of ideas to add to her framework.

3.3.3. Adapting situational analysis: Expansions made by a process explorer

> Obviously, I believe the analytic strategies I have developed and laid out here are worthy of attention and useful in terms of doing the kinds of work in research worlds that I think need doing. But other approaches are always already available and may also be provocative and interesting, perhaps in combination with situational analyses. (Clarke, 2005, p. xxxvii)

> There is no 'one right way', and as I stated in Chapter 1, I am not interested in purity. Rather, pragmatist to the core, I am interested in developing interesting and useful methods of analysis, useful tools with which to approach a wide array of research projects with quite heterogeneous forms of data. (Clarke, 2005, p. 146)

Situational analysis is intended as an inclusive, interdisciplinary approach open towards redevelopments and combinations with other approaches. I take up this opportunity by proposing three expansions of situational analysis that pushes it to become more suitable for analysis of process data and exploration of emergence and temporal complexity. Firstly, I suggest pushing situational analysis from being mostly concerned with meso-level mapping to include more small-range process mapping in order to better explore everyday emergence. For this purpose, I secondly introduce temporal bracketing as a helpful tool to reflexively bracket emergence in periods of time on which to create mappings. Thirdly, I propose to more fully embrace presentational opportunities of situational analysis, and not mainly analytical ones, to showcase emergence and temporal complexity.

Even though Clarke (2005) acknowledges the possible value of 'studying emergent or rapidly changing worlds and/or arenas' (p. 124), she touches on how to do so rather superficially and only in relation to historical studies.[22] One could argue that ethnographic process data is always, in a sense, historical but Clarke is clearly talking exclusively about history as in long stretches of time occurring a long time ago. For instance, she uses a historical work dealing with the development of modern scientific contraceptives circa 1915-1965 as example. As she concludes about historical mapping:

> In short, these maps can clarify the situation in terms of research questions and directions for the project as a whole. And they can be invaluable in making the researcher return to the big picture – particularly important in historical research where getting lost in the interesting details is an ongoing risk. (Clarke 2005, p. 289)

When I started using situational analysis, I particularly missed 'getting lost in the interesting details'. I can see why it can be problematic if you deal with a time span of 50 years (1915-1965), but when analysing processes lasting only 1.5 years as in my case, it is another story. Also, 'getting lost' is not necessarily a bad thing and I actually see 'getting lost' as a main feature of situational analysis in its focus on messiness and continual remapping. Indeed, Clarke is inspired by feminist methodologist Patti Lather who deems 'getting lost' a useful methodological approach (Clarke & Keller, 2014; Lather, 2007). Thus, the 'details' must be the problem for Clarke. This correlates with her particular interest in what she calls 'the meso-level or organizational/institutional level of analysis' (Clarke & Keller, 2014) and her examples of the mapping techniques generally fit this interest (Clarke, 2005). In my interpretation of situational analysis, however, the analytical *situation* precedes the analytical *level*. Situations are 'the fundamental units of analysis' as Clarke (2005) herself states (p. 22). She talks about 'making *the broader situation* [emphasis added] of the phenomenon under research the analytical ground' (Clarke, 2005, p. 21) but defines 'situation' with reference to thinkers who would not necessarily focus on 'the broader' in such a definition. Thomas Mathar, a social scientist who, like me, works ethnographically, has made a similar criticism of situational analysis:

> Clarke might not engage enough in small-range analysis. More importantly, this kind of situational analysis would also fit with what interactionist thinkers and Haraway seem to have meant when they emphasise the importance of considering the situation. (Mathar, 2008)

---

[22] See the chapter called 'Mapping Historical Discourses' (Clarke, 2005, pp. 261-290).

My interest in 'this kind of situational analysis' coincides with that of Mathar. While Clarke is typically interested in mapping *the broader situation*, my mapping interest also lies in *a more specific situation*, namely, a practical work situation – the on-going collaborative design interaction. This does not mean that I do not reflect on the broader situation and make broader mappings. It simply means that I furthermore find the mapping techniques helpful to explore more narrowly conceived situations, as will be exemplified more concretely in section 3.3.4. Further, in the analysis, I show how situational analysis can be useful in doing such small-range process mapping, providing valuable tools to map and explore temporal phenomena such as emergence and change.

Increasing temporal reflexivity by bracketing emergence

As mentioned, Clarke (2005) primarily touches on temporality in the seventh chapter of her book on historical discourses. In so doing, she argues for making multiple social worlds/arenas maps and positional maps for 'different historical moments' (Clarke, 2005, p. 268). I find this idea very useful, in line with what Clarke, for instance, states in relation to social/worlds arenas maps:

> In sum, maps are configurations, and looking at the social worlds/arenas for two different times vividly demonstrates the reconfigurations that have occurred – as well as helping us to see the relatively unchanging elements. (Clarke, 2005, pp. 280-81)

However, Clarke gives little direction in terms of how to analytically distinguish between different periods of time. I suggest using 'temporal bracketing' (Langley, 1999) as a tool to more reflexively construct such periods of time, essential for the type of process analysis which I advocate for.

According to Bizzi & Langley (2012), temporal bracketing is one of the most useful analytical tools to manage and make sense of the undifferentiated fluidity and complexity of process data. Inspired by Giddens' (1984) concept of 'bracketing', temporal bracketing is intended as a strategy to decompose a process into periods, enabling the researcher to structure the descriptions of events (Langley, 1999). This amplifies comparisons between different time periods and explorations of how 'joint action is temporally linked with previous joint action' (Blumer, 1969, p. 59-60), to use Blumer's words. Practically, the bracketing should be performed so that 'there is a certain continuity in the activities within each period and there are certain discontinuities at its frontiers' (Langley, 1999, p. 703). In my introduction to

the cases (section 3.1.2), I have already presented my temporal bracketing of the primary cases: In the Art Case, the process is bracketed in the Sun Project, the Moon Project and the Stars Project. Even though these periods overlap at times, I frame them as centring on distinctive activities disconnecting them, namely, developing the Sun App, the Moon App and the Stars App. In the Cultural Heritage Case, I bracket the process in the Dawn Project and the Dusk Project that similarly contain distinctive activities, namely, developing the prospectus and developing more specific exhibition guidelines.

Although this temporal bracketing may seem rather banal, it forces the researcher to be reflexive about the manner in which s/he temporally frames the situation. This framing might very well change in the course of generating and analysing the data, and the point is exactly to visualise for the reader how this choice of framing was made/changed. Thus, temporal bracketing is a helpful tool to assist in ensuring that temporality is treated in a reflexive rather than in a vague manner. In line with this, I propose to push situational analysis to become more focused on and reflexive about temporal phenomena.

Weighing presentational opportunities to showcase emergence

Fair to mention, situational analysis is very temporally focused and reflexive when it comes to the researcher's own *analytical* situation. The researcher should continually construct mappings that can help him/her develop insights. Indeed, the visual mapping techniques are first and foremost intended for analytical purposes. They are 'analytical exercises' (Clarke, 2003, p. 560; 2005, p. 83) and 'modes of analysis' (Clarke & Keller, 2014) that are 'intended as working tools rather than representational devices' (Clarke & Keller, 2014). By contrast, I argue that they can have a similarly strong value in supporting presentation, especially when temporal phenomena are in focus.

In her book, Clarke (2005) does briefly mention presentational opportunities under the rubric of a fourth kind of map, namely, 'project maps' (p. 136). Project maps are final products used to present the research. They might take different forms than the three mapping techniques of situational analysis, but according to Clarke (2005, p. 137), social worlds/arenas maps and positional maps can also be used for the purpose of presentation.[23] I agree with this notion and wish to stress the strength in using social worlds/arenas maps and positional maps as presentational tools in writings

---

[23] For examples, see Carder (2008), Friese (2010) and Washburn (2013).

about process data. As such, mapping techniques can very adequately showcase changes across different time periods (Langley, 1999). They can serve as an underlying skeleton for keeping up and bounding analysis of temporal phenomena as well as pushing analysis forward. Clarke might not disagree with these thoughts but has chosen to focus mainly on analytical traits. In contrast, my aim is to showcase that social worlds/arenas maps and positional maps can be as much a skeleton for the presentation of the process(es) being researched as the analytical process of the researcher.

To conclude, I adapt situational analysis in a manner that better suits analysis of process data and exploration of emergence and temporal complexity. Compared to Clarke's original framing of situational analysis, I propose pushing the approach towards including small-range process mapping to a greater degree in order to better explore everyday emergence, towards increasing temporal reflexivity and towards weighing presentational opportunities higher. In the following chapter, I show how I performed such a temporal situational analysis.

3.3.4. Birth of a temporal situational analysis

I worked with my data throughout the data generation process and beyond. I used the basic tools of grounded theory – coding, categorising and memoing – and I made maps on a continuous basis. I cannot display this process in its entirety due to its comprehensiveness and fluidity. I therefore focus primarily on my mappings in the following and, with reference to Appendix 3,[24] I showcase some of the maps made. I do not explain these maps in detail, but point to central changes and reflections occurring in my analytical process.

To give an overview, I have framed the analytical process in seven time periods that serve as the skeleton of the presentation. The seven periods are of course not completely separated from each other, and they do not account for all my analytical work. For the outsider, however, they give an adequate insight into my analytical process. Initially, a matrix displaying the seven periods is helpful (Figure 6):

---

[24] Due to anonymisation issues, the appendix is only accessible to the assessment committee.

Period	Time	Maps	Purpose
1	October 2012 to January 2013	Initial S-maps	Getting started
2	December 2012 to June 2013	P-maps 1	Conference paper 1
3	August 2013 to December 2013	S-maps & SWA-maps 1	Conference paper 2
4	March 2014 to April 2014	Maps of the analytical situation	Thesis
5	April 2014 to August 2014	SWA-maps 2	Thesis
6	August 2014 to September 2014	P-maps 2	Thesis
7	September 2014 to October 2014	P-maps 3	Thesis

Figure 6: Overview of the analytical process (P-maps = positional maps, S-maps = situational maps, SWA-maps = social worlds/arenas maps)

Period 1: Initial situational maps (October 2012 to January 2013)

I began my data generation in March 2012. In the first six months, my mapping efforts were very limited, and I focused more on basic grounded theory techniques. In the beginning of the data generation, I typed my handwritten field notes into my computer. At the same time, I coded the data and wrote memos (Strauss & Corbin, 1990). As visualised in the field notes example in section 3.2.2, I also did this while writing the field notes, and I reflected further while typing the notes into the computer. Later on, I realised that typing in field notes was too time consuming due to the amount of data. Instead, I had to settle for reading through the field notes after meetings, adding notes and drawings in the margins and on additional sheets of paper. Furthermore, I had a document in which I continually wrote in codes and reflections. In October 2012, I got to a point where I felt that I had a good idea about what was happening in the cases, and I started constructing mappings to expand my understanding of them.

The first maps I constructed were inspired by the techniques of *situational maps*. Situational maps are maps of all the most important human and non-human elements in the situation studied. The elements displayed can be non-human actants, organisations, spatial aspects, social groups, sociocultural aspects, hot issues, key events, individuals, ideas/concepts and so on, depending on the situation studied (see Clarke's abstract situational map, Figure 7). Situational maps can be structured in a messy or a more orderly fashion, but either way, the idea is to empower the analyst by

providing an overview of everything important. Furthermore, they can be very useful for relational analysis, meaning the investigation of relations between different elements in the maps.

Figure 7: Abstract situational map (Clarke, 2005)

After having made some very messy maps, I composed a more ordered situational map (Appendix 3: 1.1) in which I also investigated relations between the elements. The element 'idea/concept' captured my attention, and I constructed further mappings cascading around 'idea/concept' in the months that followed (Appendix 3: 1.2 and 1.4). By 'idea/concept', I meant the idea/concept developed in design processes before the concretisation into a product. Up to this point, I had spent a great deal of time thinking about different levels on which I could focus. I was asking myself questions such as: Should I focus on the overall business models, initiation and contract issues? Should I focus on project management, on facilitation of collaborative design activities, on ideation issues or construction issues? And how did the actual product relate to these different levels? For instance, I made the two network displays in Appendix 3: 1.3 in which I very systematically tried to understand the relationship between different levels.

95

The situational maps (Appendix 3: 1.1, 1.2 and 1.4) reflected my interest in ideation and a level on which concrete design interaction took place. However, by using the rather abstract 'idea/concept', I was still being open about what the product could be. For instance, digital technology is mentioned in parentheses in Appendix 3: 1.1 (in the middle circle it says: 'Important elements in innovative development processes at museums (of digital technologies)' Appendix 3: 1.1).

Period 2: Positional maps 1 (December 2012 to June 2013)

Having constructed the rather broad situational maps, I felt inspired to move my analytical focus to deeper grounds due to my interest in design interaction. More particularly, I wanted to explore an issue that was very much negotiated in the Art Case. At this point, I had not concluded the data generation, particularly not in the Cultural Heritage Case, but in my continual coding activities, I had noticed that participants in the Art Case kept returning to and disagreeing about whether to target a solution narrowly or broadly.

The term 'targeting' derives from marketing theory, and a 'target group' refers to the particular group or segment of people/users that a product, service, message or the like is intended for. Essentially, the idea is to delineate part of the market instead of trying to reach the whole market at the same time (Vinderskov, 2010). In my coding of the data, the term was clearly contested and dynamic, something that was understood and described differently, rooted in some difference between the two organisations: the museum and the design company. As I began analysing the data more selectively, it turned out to be much more complicated than that. The apparent difference did not make sense in itself since I saw contrasting views on it both across and within the organisations, and these views transformed over time. This inspired me to work more dynamically with viewpoints than to root them in individuals, organisations or separated social groups. Furthermore, the changes I saw inspired me to work with temporality as an important analytical dimension.

I found *positional maps* to be highly adequate to further investigate this analytical interest. The word 'position' has many possible meanings, but in the context of positional maps it refers to what the *Oxford English Dictionary* defines as 'an opinion, attitude, or viewpoint on a particular subject'.[25] It should not be confused with *positioning theory* which focuses on how individuals position themselves and each other (e.g., Harre & Slocum, 2003).

---

[25]http://www.oed.com.molly.ruc.dk/view/Entry/148314?rskey=grv00s&result=1&isAdvanced=false#eid

In positional maps, the aim is to map positions on their own terms and not as anchored in particular individuals or social groups. As Clarke (2005) puts it, positional maps are intended to 'represent the heterogeneity of positions' (p. 126), thereby acknowledging that 'Individuals and groups of all sorts may and commonly do hold multiple and contradictory positions on the same issue' (p. 126). In that sense, positional maps rise above social centralisation and stereotyping to add another possible layer of complexity to the analysis, building heavily on postmodernist ideas about moving beyond 'the knowing subject' (Foucault, 1973, p. xiv). However, Clark (2005, p. 127) is not religious in terms of this view and deems it legitimate to relate these positions to individuals and social groups in later analysis. In a positional map, positions are marked in a system of coordinates with two main axes, X and Y. The two axes are typically laid out in terms of 'more versus less' (Clarke 2005, p. 128), as exemplified in Clarke's abstract example (Figure 8).

```
+++
                Position
                   1
                                              Position
                                                 6

A
x
i                    Position
s                       3

1
                                Position
                                   2




                Position                  Position
                   4                         5


---
        ___              A x i s  2              +++


        ┌─────────────────────┐
        │ ++ = more so        │
        │ ── = less so        │
        └─────────────────────┘
```
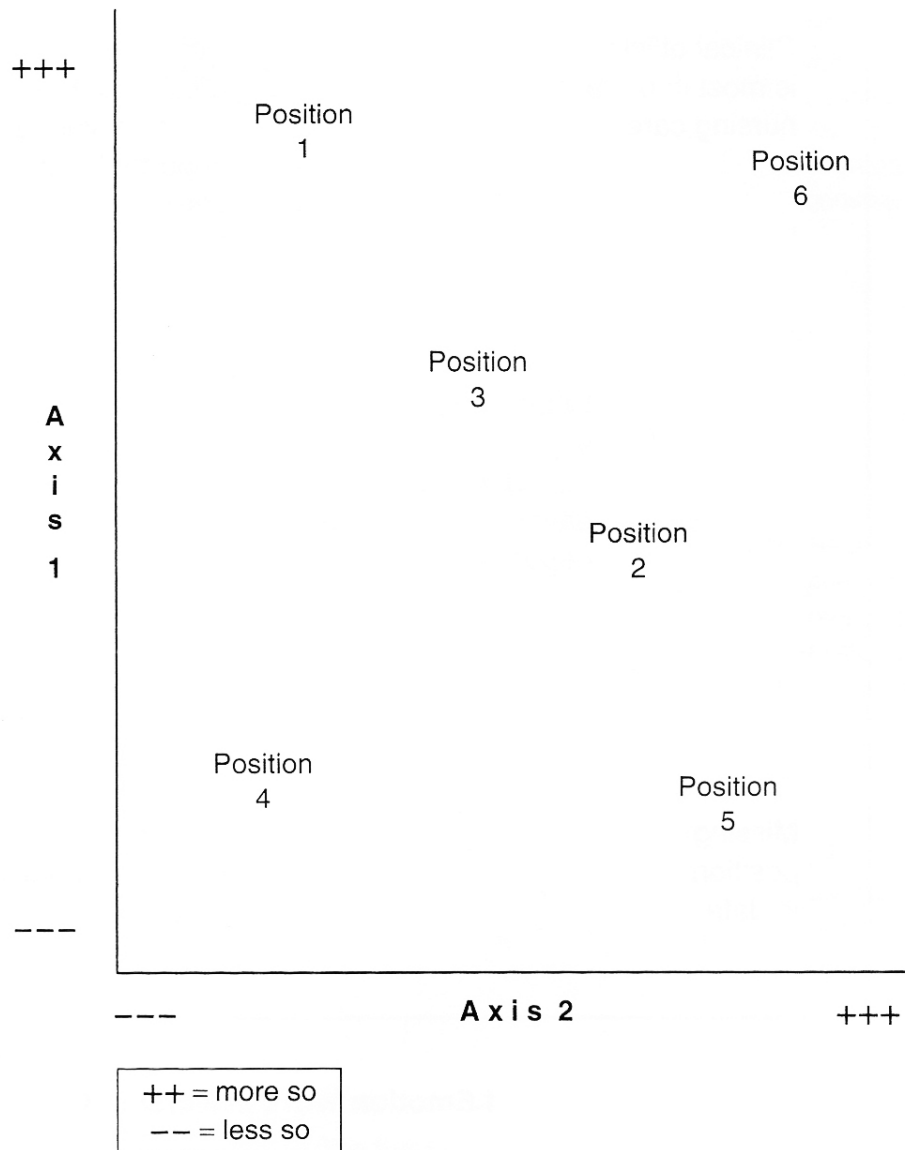
Figure 8: Abstract positional map (Clarke, 2005)

In thinking about how to make positional maps that zoomed in on the contestation of targeting, I experimented with using theoretical concepts (temporal bracketing and centripetal/centrifugal forces) to define the axes as visible in Appendix 3: 2.1 and 2.2 (2.1. is very blurred since it is drawn on the back of a library receipt). However, I decided to ground the mappings more in the actual data, and to do that, I made a set of mappings of all elements of importance in each of the three projects of the case; the Sun Project (Appendix 3: 2.3), the Moon Project (Appendix 3: 2.4) and the Stars Project (Appendix 3: 2.5 and 2.6). These maps are a kind of very detailed situational maps in which I could get an overview of important elements and statements from the data. Based on relational analysis, I condensed each of

these mappings into a range of positions and experimented with making a positional map for each project (Appendix 3: 2.7) as well as with making only one map with time as the dimension on the x-axis, displaying positions more or less orderly (Appendix 3: 2.8 and 2.9).

Based on the positional analysis, I wrote a conference paper for a conference about process organisation studies (Rørbæk, 2013a). For this paper, I decided to present one very neatly arranged positional map displaying the emergence of positions on 'defining a target group' (y-axis) over time (x-axis) (Appendix 3: 2.10 – A, B and C are the Sun Project, the Moon Project and the Stars project, respectively). I received valuable feedback on the paper that I used later on for further expanding my positional analysis (Period 6).

Period 3: Situational maps and social worlds/arenas maps 1 (August 2013 to December 2013)

In Period 2, I was very immersed analytically in the Art Case, and I wanted to zoom out again to a broader situation. Also, at this point, I had generated almost all of the data in both primary cases, and I was ready for more comparative ventures. I made a couple of situational maps, for instance, Appendix 3: 3.1. Furthermore, I made *social worlds/arenas maps* to compare the complex social interactions taking place in the two cases.

Social worlds/arenas maps are intended as exercises to make collective sociological sense out of the situation studied (Clarke, 2005, p. 110). To get an overview of the complex social relations, social worlds/arenas maps serve as analytical exercises for specifying key social worlds and arenas (Clarke, 2005, p. 112). Figure 9 illustrates an example made by Clarke on nursing work:
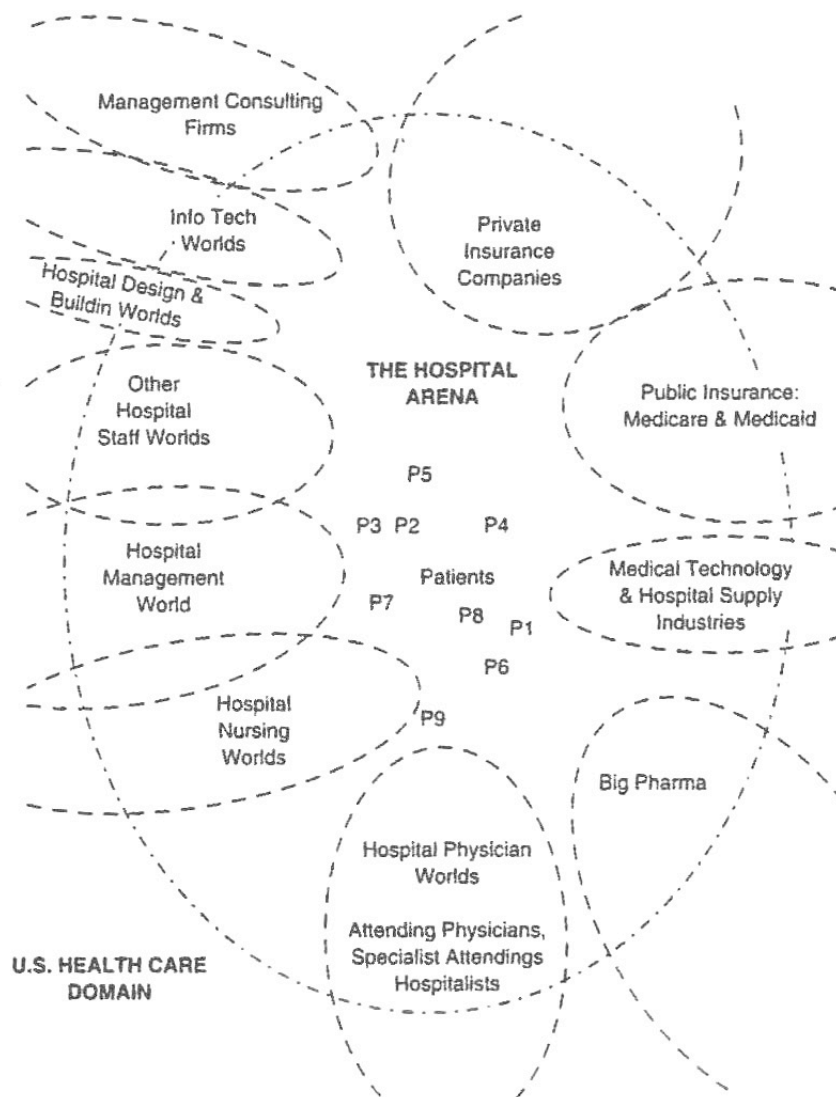
Figure 9: Social worlds/arenas map of nursing work in the hospital arena (Clarke, 2005)

On September 28, I had a particularly productive social worlds/arenas session in which I developed maps showing how I went from constructing the arena as 'ICT design for exhibitions' to more complex intersections of arenas and worlds positioning what I called 'project group arenas' in the centre of the maps (Appendix 3: 3.2 to 3.10). Interestingly, I only thought about displaying changes in the Cultural Heritage Case at this point. Thus, the Art Case projects were more similar in terms of participants.

Focusing the maps around the project group arenas again showcases my interest in delving further into the details. I also decided to make a very detailed situational map as I did with the positional maps in Period 2. This time, I used data from both cases and constructed the situation as circulating

'challenges for collaborative design between museums and ICT design companies' (Appendix 3: 3.11). Based on these mappings and relational analysis, I again wrote a conference paper. This time, for a conference on design and digital heritage, however, without displaying any maps in the paper (Rørbæk, 2013b).

Period 4: Maps of the analytical situation (March 2014 to April 2014)

After having concluded my data generation and received feedback on the two analytical experiments presented in my conference papers, I decided to use a fair amount of time to read through all of my material again to develop my analytical framework and figure out which stories to focus on in my thesis. A great deal of patience and reflection was needed to avoid sticking only with my initial ideas. Also, it was difficult to get an overview of the extensive and very diverse data set, and I therefore did an exercise inspired by situational maps, focusing on my analytical situation.

For this mapping, I cut out small pieces of paper that could easily be rearranged. On these small pieces of paper, I wrote down all the elements that I found central to my analytical situation. This consisted, for instance, of things/non-human actants like 'the application for funding' and 'technology'; of organisations like 'the art museum' and 'the cultural heritage museum'; of theoretical concepts like 'boundary negotiating artifacts' and 'centripetal/centrifugal forces'; of hot issues like 'technology as targeted' vs. 'technology as non-targeted'; of temporal elements like 'change', 'long term' and 'emergence' and so on. I then started to relate the pieces of paper and did a great deal of adding, discarding and rearranging over a time span of a couple of weeks. A picture of one of the sessions is inserted in Appendix 3: 4.1. I'm standing on a table (my shoe is viewable in the bottom left corner), trying hard to get an overview and I take the picture to memorise the current composition of elements.

What this playing around with analytical elements helped me realise was that three categories in particular could be useful guiding themes for my analysis, namely, involvement of digital designers, understanding of digital museum communication and negotiation/co-design of digital museum communication. The other pieces of paper could be meaningfully arranged in relation to these themes. In the completed thesis, the themes match the research questions, but at that point in time, I had not framed the questions as such. Also, I realised that I had to divide the analysis in at least two parts since I did not have sufficient data in the Cultural Heritage Case on negotiation/co-design of digital museum communication due to the very

early stages portrayed in the case. The data from the supplementary cases neither had much to contribute with in terms of this topic.

From this point, I therefore chose to focus on two analytical endeavours: the first part of the analysis, Chapter 4, focusing on the involvement of digital designers and the understanding of digital museum communication in both the primary and supplementary cases; and the second part of the analysis, Chapter 5, focusing on the negotiation and co-design of digital museum communication in one of the primary cases, the Art Case. I went through my data material yet again to more selectively pick out the relevant passages for these themes and forwardly expanded my analytical work on the basis of this condensed data material.

Period 5: Social worlds/arenas maps 2 (April 2014 to August 2014)

I now had a plan in terms of what to focus on in the analysis chapters of the thesis, and I started to think about whether and how I could use the mapping techniques in the presentation. In my prior analytical experiments, I had good experience of using positional maps to present the negotiation and co-design of digital museum communication (Period 2). Further, social worlds/arenas maps had helped tremendously in getting an overview of the complex array of participants in the cases (Period 3), and I assumed that they could also be helpful tools for a reader trying to understand how digital designers were involved in the cases. Thus, I decided to further develop my social worlds/arenas maps to more concretely support the first analytical chapter.

To do so, I wanted to zoom in on what I called 'the project group' in Period 3 and cut off broader relations. The focus of these maps was specifically related to how the digital designers were involved in the project groups. To further enrich this small-range mapping, I anchored participants in specific social worlds. This is a gross analytical simplification since individuals belong to different social groups at the same time, and their relations to social groups change over time. However, in my small-range mapping I found some interesting patterns in terms of how individuals were constructed by each other, as defined by their belonging to different organisational and functional units. Further, connections between these social groupings resulted in new social worlds, and I wanted to be able to portray *some* of this emergence even though in a simplified manner.

Appendix 3: 5.1 to 5.11 showcase my first attempts at constructing these maps. I framed the maps of the Art Case around 'the museum arena' and the maps of the Cultural Heritage Case around 'the exhibition design

arena'. I later had the idea to structure the Cultural Heritage Case around'
the new museum arena' and to significantly expand the maps to better
display the difference between the two cases and to more robustly support
my analytical story (Appendix 3: 5.12). I explain these issues in greater detail
in the analysis when the final maps are presented.

Period 6: Positional maps 2 (August 2014 to September 2014)

Based on some of the feedback received in Period 2, I wanted to expand my
positional maps in various ways. The existing positional maps were too
simplistic and they could easily showcase further complexity by adding a
dimension as I had already experimented with in Period 2. Thus, instead of
making one map, I constructed three maps (one of each project in the Art
Case), and the x-axis was then free to hold a new analytical dimension.
Already in my detailed situational mappings in Period 2 (Appendix 3: 2.3 to
2.6), another central issue discussed by the participants was present and
clearly intertwined with the discussions on targeting, namely, the
disagreements about whether to construct a simple or complex solution. I
had, however, decided to narrow my scope to discussions on targeting due
to the brevity of conference papers. In constructing the thesis, I wanted to
include this issue since it was discussed as much as, if not more, than
targeting.

Based on my selective condensation of the data material, I first tried to map
positions in relation to targeting (on the y-axis) and complexity (on the x-
axis) (Appendix 3: 6.1 to 6.3). Having these two dimensions on the axes,
however, turned out to be overly redundant since they tended to merge:
Arguments for narrow targeting favoured a simple solution and arguments
for broad targeting favoured a complex solution. Instead, I found it more
useful to see how these different arguments judged different approaches. I
therefore inserted 'quality' on the x-axis and 'simplicity/narrow target group
vs. complexity/broad target group' on the y-axis. I condensed the positions
from the maps in Appendix 3: 6.1 to 6.3 to fit the new structure of the maps
(Appendix 3: 6.4 to 6.6).

In making these maps, I also wanted the positions to be less stable and much
more fuzzy. In the positional maps from Period 2, the positions were similar
in all three projects and did not display changes and interactions occurring
within and among positions. Instead, I made my linguistic framing much
more dynamic and 'emic' (Harris, 1976), and I used the placement of
positions to highlight coherence between the positions across the three
projects.

Based on my experience from Period 2, I furthermore found it helpful in the presentation of the analysis to root the positions in individuals. Similarly, I decided to first present a narrative account of what happened in the three projects and, afterwards, sum up the positions formed in the positional maps. In the conference paper written in Period 2, I first presented my positional map and then explained it. Due to this structure, many critiqued the map for being too difficult to understand and gave up trying to understand it pretty quickly. By first presenting the positions linguistically and anchoring them in individuals, they became much more concrete. I could thereby help the reader better understand the situation before seeing the complex positional maps.

Period 7: Positional maps 3 (September 2014 to October 2014)

These positional maps, which sum up the positions taken on major negotiation points in the three projects of the Art Case, turned out to be very useful for further interpretation and comparison with findings from other studies and theoretical notions. I had not foreseen this, but got the idea to further develop the maps in Period 6 when I very carefully reflected on the different character of the positions. I began to notice that many of the positions were significantly shaped by or enacted in relation to three aspects, namely, artifacts, structural conditions and user workshops (see the parentheses added after positions in Appendix 3: 7.1 – '(A)' referring to artifacts, '(S)' referring to structural conditions and '(E)' referring to user workshops, called 'event' at the time).

Later, I more systematically compared these relations (Appendix 3: 7.2 to 7.4). I also experimented with interpreting the emergence in the maps with the concepts of centripetal/centrifugal forces that I had already thought about using in Period 2 (Appendix 3: 7.5). Furthermore, I drew on perspectives from theory of boundary objects and boundary negotiating artifacts, as seen in Appendix 3: 7.6 to 7.8. Based on these analytical exercises, I found that two boundary phenomena had particular relevance for the emergence happening in the Art Case, and I related these boundary phenomena to two axes on the positional maps, namely, the axis of ambiguity and the axis of reification (Appendix 3: 7.9 and 7.10). Again, this will be further explained later on when I present the interpretations of the maps in the actual analytical chapters.

3.3.5. Writing the analysis

> Writing, in short, does not come after analysis; it is analysis, happening as the writer thinks through the meaning of data in the display. (Miles & Huberman, 1994, p. 101)

Finally, I would like to stress the importance of writing in constructing the analysis. Indeed, as Miles & Huberman have expressed, writing and other presentational quests are an essential part of constructing an analysis. Even though I had a plan before I started putting down the words, these words resulted in new perspectives and unforeseen presentational challenges. The two aforementioned conference papers were my first extensive analytical write-ups and thereby served as experiments, thus giving me insights into possibilities and challenges of writing the analysis. Besides getting valuable feedback, I learned several important writing lessons, for instance, that the positional maps needed much more explanation than I had first imagined and that presenting process research in article mode was no easy task (Pettigrew, 1997, p. 346).

In terms of writing the actual analytical chapters for the thesis, this experience helped me anticipate difficulties in relation to developing a clear and coherent text about the complex and very divergent cases. I found that a significant amount of explanation and description was needed to enable analysis, and, to structure the analysis, I was therefore greatly inspired by Blumer's (1969) distinction between making descriptive, comprehensive and intimate accounts that give an adequate explanation of 'what takes place' (p. 42) versus the need for inspection/analysis that more directly examines it. In a similar manner, anthropologist Harry F. Wolcott (1994) has advanced ideas about splitting the qualitative data transformation process in three parts: description, analysis and interpretation.

As already noted, the analysis is divided in two parts. Each of these chapters (Chapter 4 and Chapter 5) begins by being mostly descriptive, increasingly becoming analytical and interpretational. Thus, I do not divide strictly between the three foci. Like both Blumer (1969) and Wolcott (1994) I see these processes as intertwined and therefore prefer to allow them to emerge fluidly. Still, however, thinking about the underlying structure in this way serves to build up the arguments posed in a stepwise manner.

To prelude this stepwise construction based on my rich data set, I will conclude the methods chapter by presenting a snippet from my field notes to attend to a couple of methodological reflections not yet mentioned despite their relevance.

3.4. FURTHER METHODOLOGICAL REFLECTIONS: DANGERS & LIMITATIONS

> After the meeting, Hannah (project manager assistant) and I get a ride with the people from the partnering museum (Florence, Michelle and Noah). It rains a lot, and we're driving very fast in the outer lane on the motorway. Florence is driving and we joke about her speedy driving. Suddenly, the windshield wipers jump to one side and the windshield becomes blurry, full of water. Florence screams 'I can't see anything'! Panic spreads instantly in the tight cabin. Hannah, sitting next to me, grabs my arm. This is a dangerous situation. Luckily, the traffic isn't dense, only a couple of cars need to pass in the other lanes before we can manoeuvre towards the emergency lane. Afterwards, we call for road assistance. We wait in the emergency lane for almost two hours before they arrive. They take us to a road assistance station where we wait half an hour for a taxi. While we wait, we talk about everything, serious and not so serious stuff, everyday life and work life. We get to know each other. We process the experience, and we joke about it being a team building exercise. Indeed, it has brought us closer together. (Field notes, 052213)

There are several important methodological issues to reflect on in relation to this field note snippet. Firstly, doing research was not without risks. Mostly, however, the risks were more of a mental than a physical nature, the potentially fatal car accident tale above being an extreme example. In particular, I experienced the risk of what has, for instance, been called 'death by data asphyxiation' (Pettigrew, 1990, p. 281) or 'drowning in a shapeless mass of information' (Langley, 1999, p. 693). The data set was extensive, and since I to some extent sought to get lost in the details, it was at times difficult to find a way home.

The mapping techniques presented helped me on the way, but they are, of course, only one way to do it. They serve one kind of analytical construction, and like all other methods, they have limits in terms of their usefulness. I find it particularly important to mention that maps, in a sense, lie (Turnbull, 2000). Thus, similar to metaphors, they are a 'partial abstraction' (Miles & Huberman, 1994, p. 250). They do not innocently mirror the empirical world but influence meaning making in particular ways. Obviously, condensing thousands of pages of data material in one map entails focusing on some things and ignoring others. Yet, maps can be quite convincing, and even though I see that as their strength, I am at the same time aware of the potential danger of becoming enslaved by their logic. As sociologist Margarete Sandelowski (1994) maintains, rules of methods serve us 'but only to a certain point, after which they may enslave us' (p. 56). Alas, we are only human, and human understanding has a

tendency to suppose 'a greater degree of order and equality in things than it really finds' (Bacon, 1853, p. xlvi).

To try to avoid this danger, my goal has been to not slavishly follow established approaches, to develop situational analysis to serve the needs of the context I studied and to make maps that are not too simplistic. As noted earlier, I have sought to map some of the complexities in the data, and in this methods chapter, I have generally tried to be explicit about the focus of the maps and the approaches followed. Also, the narrative accounts surrounding the maps hopefully assist this intention. Seen from a more general viewpoint, these dangers of representation and simplification can of course be said to be a quintessential paradox of all science and all kinds of representational practices. As philosopher Michael Polanyi so beautifully expresses:

> The traveller who admires a landscape sees a particular image of trees, fields, rivers and peaks, and nearer to his position he hears church-bells ringing and sees villagers walking to attend service. His experience is composed of particular instances of the classes denoted by the terms 'tree', 'river', 'peak', 'church-bell', 'villagers', 'walking' and 'religious service', etc., but when he reports the scene he is admiring, his experience will be represented in these general terms, which will not transmit the particular instances that his senses are witnessing. While these experiences will remain his private recollections, his report will convey to its reader merely a conception of the writer's experience. (Polanyi, 1967, p. 309)

Returning to another scene, the one about the car accident preluding this section, I want to address another particularly relevant set of dangers and limitations in my study. I end the scene by stating: 'Indeed, it has brought us closer together'. This statement is affiliated with a classic methodological challenge in ethnographic and empirical studies: the challenge of wanting 'to get close' (Blumer, 1969, p. 46), to come to know the empirical domain and simultaneously striving for ensuring confidentiality, privacy and trust of the participants being studied (Macdonald, 2001). According to Macdonald (2001), this can be particularly challenging when the researcher crosses into domains that are typically not viewable to others.

Following people behind the scenes for more than 1.5 years of course meant that I got close to them. Also, my presence became somewhat naturalized, thus perhaps reducing 'the filter' of the participants. I was always there, always eager to listen and observe. I chatted with participants over lunch and coffee, participated in 'team-building events' such as the car accident, witnessed the ups and downs, listened in on conflicts and discussions, observed a fair amount of mudslinging and blaming each other for mistakes and, to be completely frank, sometimes even heard things that I wished

people had not said in my presence. This can be problematic in two ways: it can be dangerous or harmful for the participants since they might have shared something that could compromise them. Conversely, it can be limiting for my analysis because, naturally, I developed a feeling of protectiveness towards the participants who let me 'in', some of whom I got to know quite well.

How did I deal with this? Firstly, by not presenting drama, conflicts or mudslinging unless it was necessary to state a point analytically. Secondly, by trying to be genuine about my role in the project and my research interests. This, however, partly failed since my role and interest naturally changed in the course of doing exploratory research. The participants therefore consented to let me observe their practice without having a clear idea about the outcome. Thirdly, and as a result of this, I found anonymisation of the cases and participants essential. Appointing pseudonyms to the cases and participants also helped me to let go of some of my protectiveness since I started to think about the participants as constructed representatives instead of real persons.

Important to mention, anonymisation has a noteworthy downside: To ensure anonymisation, I cannot in a detailed manner account for the specifics of the cases. For instance, I am not able to fully explain contexts, organisations, products developed etc. because such information would make the cases recognisable. Thus, some information is withheld from the reader for the purpose of protecting the participants. Moreover, anonymisation works only to a certain degree in Denmark since it is a very small country, and some people would perhaps be able to come up with a rather good guess about the identity of the cases and participants. Also, the participants can of course quite easily guess who is who internally in a case.

I thought a great deal about what I could do about this and decided to send my analysis to selected participants to give them the opportunity to read it before publication, a kind of 'member checking' (Guba & Lincoln, 1981; Miles & Huberman, 1994). More than 50 people were involved in the cases, and it would be overly arduous to send it to all of them. Instead, I thought about for whom of the participants the results of the study could be most dangerous or harmful. In the end, I chose to send it to four people: the two project managers, Emma and Alex, and two of the participants from the design company in the Art Case, Julia and Benjamin. I chose these people on the basis of three criteria: they have a central role in the analysis; they are easily recognized because of their titles or roles (project manager (Emma and Alex), creative director (Benjamin) and broker (Julia)); and they, particularly the project managers, have an overall knowledge about the projects and the participants. Thus, I counted on the project managers to

inform me if they spotted problematic instances not only in relation to themselves but also in relation to other participants. For instance, Alex asked me to change or delete a couple of formulations for the benefit of other participants.

Overall, there are many additional dangers and limitations that could be interesting to dwell on. Due to the limited space, I have however chosen to draw forth the aforementioned ones since I find them particularly pertinent. Throughout the methods chapter, I have further tried to clarify and reflect on the choices, the chosen approaches and the consequences of these choices to convey transparency. However, I believe that some of these approaches and their usefulness will only truly become clear when they are further presented and applied in the analysis. Thus, it is time to really dig into the matter of things, 'to arrive where we started' (Eliot, 1943, p. 59), literally speaking.

4

ANALYSIS PART 1: INVOLVING DESIGNERS &
UNDERSTANDING DIGITAL MUSEUM
COMMUNICATION

Rebecca: Others decide how our communication should be. If we have a good idea, then why not let us pursue it? I think that's frustrating and an obstruction for museums. One year our national seminar on communication is about one thing, as are international conferences where people from other countries are invited, and the message from the Danish Ministry of Culture is that 'this is the only way to go', well aware that after the fall, everything closes down and it's no longer interesting. Then something else is hot. It's simply too short-sighted. I know that I have said this twice already, but I am so serious about it.

Me: Yes, I know what you mean. I also see some related challenges in terms of writing applications for funding. Then the money is granted and you become bounded by what you have written in the application – that you should do exactly that – but you find out that it really makes no sense at all to do so.

Rebecca: Exactly [...] It's quite unfortunate and it's not just the funding from the Danish Ministry of Culture, really; a lot of the available funding is about what is hot right now. And I would like that to be different [...], that they would show confidence in us. If we believe in a project – we really want something – then show us the confidence. Because we all just sit around and design our projects so they fit into a template. (Interview, 120913b)

Looking back on the above interview conversation, I remember being quite stimulated by the last comment. Outside a cold fog surrounds the beautiful

new museum being built and we cosy up inside for a talk about how it came to be. I say 'talk' since I clearly participate in this part of the interview, obviously rather critical of the system that, in a monetary sense, have enabled the warmth and cosiness around me. However, the conversation further motivates me to look into the problem of the 'template' referred to by Rebecca.

While the conclusion of this first part of the analysis is indeed related to the template, there is an important story to be told before we get there. The story starts by tracing how digital designers are involved in the two primary cases: the Art Case and the Cultural Heritage Case. Thus, since none of the museum staff involved in the two cases are particularly knowledgeable in terms of the digital, it seems natural to start with answering sub-research question 1 on how digital designers are involved. By presenting five social worlds/arenas maps, I point to a parallel pattern in terms of involvement even though the two cases are very diverse, as argued in the methods chapter (see section 3.1.3). This pattern is largely related to how technology is understood and how this understanding develops throughout the time span of the cases. Thus, the analysis presented in the current chapter is also concerned with sub-research question 2 on how digital museum communication is understood.

The chapter is constructed in a way that slowly allows the argumentation to unfold. I start with a fairly descriptive account of the involvement of designers and increase the analytical and interpretative means along the way. The argumentation posed is threefold: Firstly, I unravel the parallel pattern in the two cases in terms of how digital designers are involved. Secondly, I argue that this pattern is related to how technology is understood. In the beginning of the cases, they are both dominated by a technocentric, deterministic and fixed conception nourished by the Danish funding system. Thirdly, based on the experience of the designers and museum staff involved, I propose that technology needs to be understood as something flexible and dynamic to enable co-design across different social worlds. In a final concluding discussion, I relate the arguments posed to the discussions and findings presented in the literature and theory chapter.

First, however, it is time to go behind the scenes and follow my efforts in tracing how digital designers are involved in the two cases.

4.1. INVOLVING DESIGNERS: A PARALLEL PATTERN

As explained earlier, social worlds/arenas maps can be used to identify and explore the key social worlds and arenas in a given situation. While these maps are indeed 'crude drawings' (Clarke, 2005, p. 115), they offer at least three benefits: they stimulate reflection on how to best represent the situation; they serve as a conceptual infrastructure for the story I am telling about how digital designers are involved in the two cases; and by looking at earlier versions of the maps, they showcase some of the analytical process of getting to that story (see section 3.3.4) (Clarke, 2005).

Contrary to Clarke, I focus more on what happens in between the maps than the actual maps due to my interest in showcasing emergence. In the pages that follow, I present maps of the three projects in the Art Case and the two projects in the Cultural Heritage Case, and I compare and analyse the similarities between what happens in the two cases. The situation showcased in these maps is quite specific. I am interested in showing a work situation and the on-going interaction between arenas and social worlds when working together. The social worlds/arenas maps focus on which social worlds are present in the collaborative design processes under study and concretely map who physically meets and negotiates design in actual meetings.[26] Thus, as stated earlier, the focus is more on idea and concept development than construction, and the aim of the maps is to showcase who has a say in terms of this ideation.

Having established that the situation of interest in the following presentation is the work situation in the collaborative design processes, we can go further into a definition of arenas and social worlds in each of the two cases. We begin with the Art Case.

4.1.1. Social worlds/arenas maps of the Art Case

In the Art Case, I have chosen to focus the maps around what I call the museum arena. The arena correlates with a physical entity, the actual

---

[26] In both cases, other people are involved in the processes, but do not take part in the meetings. To give an example: In the Art Case, those constructing the technological elements of the solutions (e.g. coders, programmers and system engineers) do not take part in the meetings and are therefore not displayed in the maps. Thus, those participating in the meetings are the ones designing the solutions (the digital designers, hence labelling the world 'digital design'). In the Dusk Project of the Cultural Heritage Case, one world not participating in the meetings is however displayed to illustrate a particularly important point (this world is related differently to the new museum arena to signify the difference, see Figure 16). Also important to mention, I have chosen to not display in the Sun Project map a researcher participating in the very first meeting of the project because he participated minimally (one meeting) and has no relevance for the story I am telling. Thus, I have chosen to remove him in the version of the map presented here to minimise confusion (based on inputs from people looking at the maps and reading the analysis).

museum, which I see as positioned at the centre of issues discussed between the social worlds present in the collaborative design processes. Also, framing it this way points to the different statuses of social worlds. Most of the participants inhabit the museum arena (the social worlds of the museum) while the digital designers (the digital design world) is invited into the arena. This is illustrated in the social worlds/arenas map of the Sun Project inserted below (Figure 10).
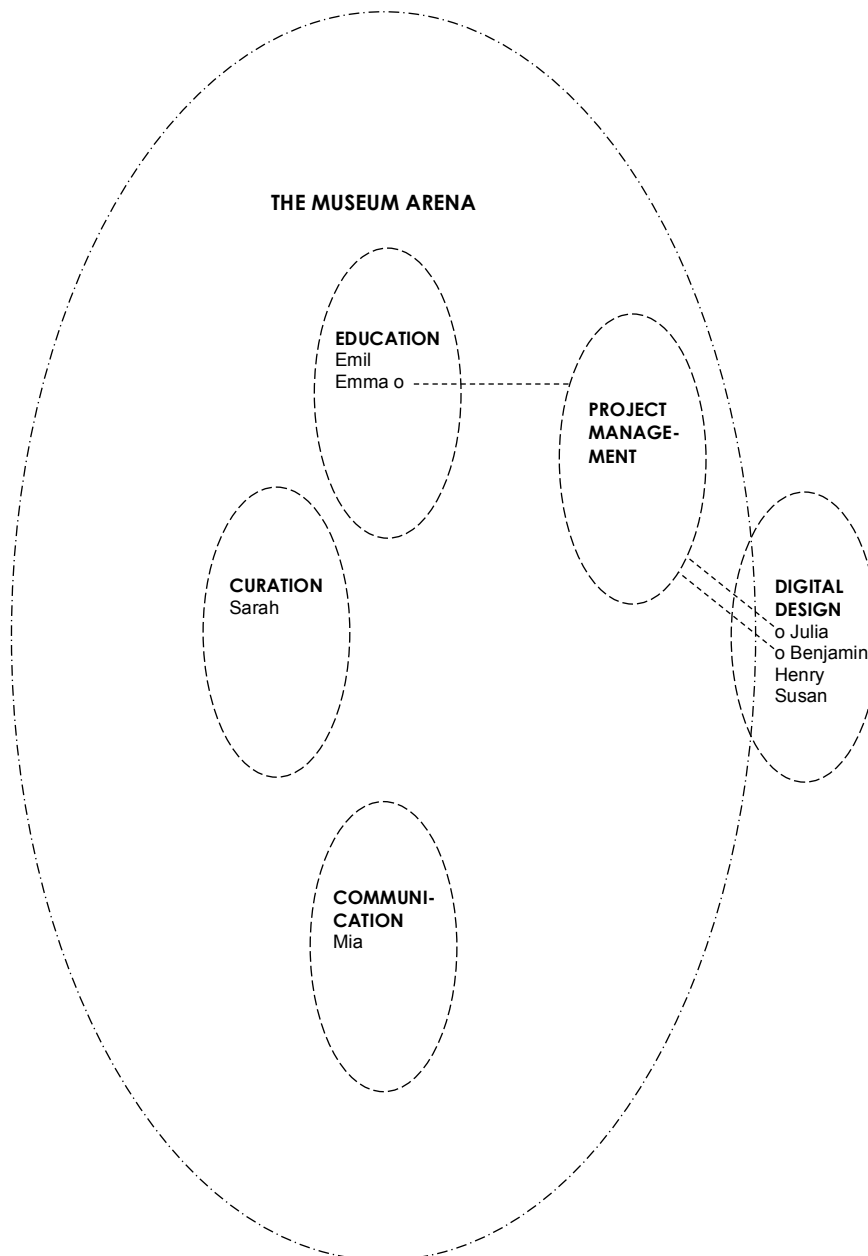
Figure 10: Social worlds/arenas map of the Art Case: The Sun Project

In the Sun Project, the museum project manager, Emma, involves museum staff from her own department, the education department, and from the curation and communication departments – identifiable on the map as worlds of education, curation and communication, respectively. As illustrated, staff from the digital design company are invited into the museum arena as a world that I label digital design.

While many (sub) social worlds potentially inhabit or arise internally in these departmental and institutional worlds or in the interrelation between them, one is highlighted in the map since it has particular relevance in the situation: in planning and managing the project, the world of project management emerges. This world is inhabited by Emma, Julia and Benjamin and is thus a cross-institutional world showcasing what Strauss (2010) depicts as a process of getting involved with alliances (marked by the straight dotted lines). Emma, Julia and Benjamin manage the project, and communication between the two organisations mainly goes through them in between meetings. Their community of practice is particularly strengthened when the three of them go on a weekend trip to do some film shoots in the construction phase of the Sun Project.

Later on, in my concluding interview with Emma, she mentions this trip as particularly valuable for the collaboration:

> Emma: It was definitely something that gave us another kind of tolerance or safety in the collaboration because we were, well, if you are on unknown ground together, it strengthens the confidence you have in each other, or that's how I experienced it; that everybody used resources and prioritised the collaboration. (Interview, 091613)

In the Moon Project, they continue their collaboration, and the map of the Moon Project (Figure 11) signals an increasing connectivity between the social worlds.

THE MUSEUM ARENA

EDUCATION
Jennifer
Emma o
Maya
Emil o
Lucy

PROJECT
MANAGE-
MENT

CURATION
Sarah o
Sandra
Maria
Mark

THE SUN
PROJECT

DIGITAL
DESIGN
o Julia
o Benjamin

COMMUNI-
CATION
Mia o
Amanda
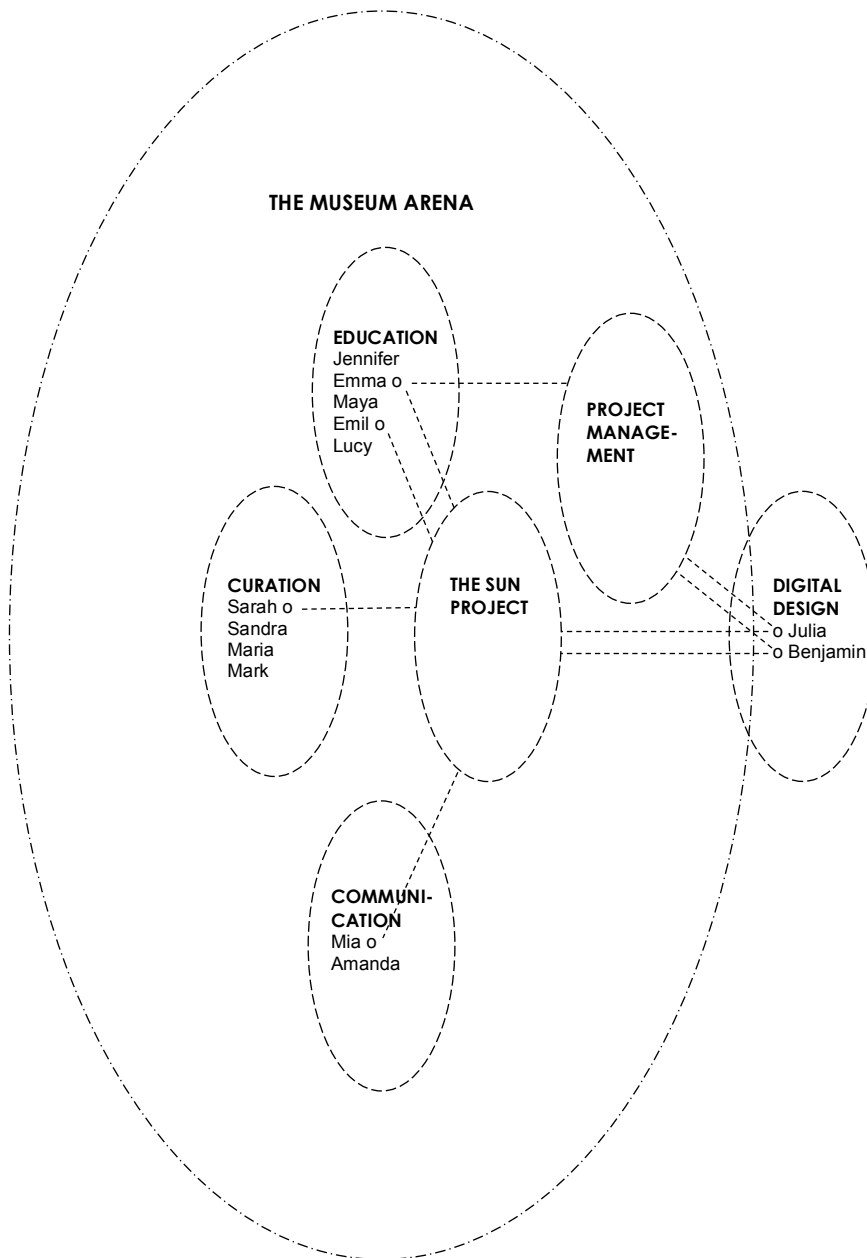
Figure 11: Social worlds/arenas map of the Art Case: The Moon Project

While all the Sun Project participants from the museum are also involved in the Moon Project, Julia and Benjamin are the only ones from the digital design company who are still involved. All of these people, having participated in the Sun Project, are part of a new noteworthy social world, namely, the world labelled the Sun Project. This world signals the community of practice developed during the course of the Sun Project. The alliances between these people become clear in the first meeting of the Moon Project where they clash with a new group of people involved, namely, those who are planning the Moon Exhibition. The Moon Exhibition people already have an idea for the Moon App, an idea that is

criticised by the Sun Project people. Especially one of the Moon Exhibition people, Jennifer, is passionate about this idea, and when I talk to her later in the process, she tells me about her experience of clashing with the Sun Project people at this first meeting:

> Jennifer tells me that she thought the museum staff wanted the same thing in terms of the Moon App. They had been talking about it for half a year, and it was considered a part of the exhibition strategy for the Moon Exhibition. It surprised her that some of the museum people dragged the design in another direction. She was frustrated because she thought they had the same understanding about and desires for the app. (Field notes, 082112)

The digital designers also note the disagreements between the museum staff, as they tell me in an interview about the Moon Project:

> Julia: At the first meeting, it was very clear that they hadn't reached a consensus about what they actually wanted at the museum. (Interview, 090312)

Despite the initial differences, the Moon Project participants manage to collaborate and those who continue onto the last project, the Stars Project, build a community of practice, resulting in a new world labelled the Moon Project in the social worlds/arenas map of the Stars Project (Figure 12).
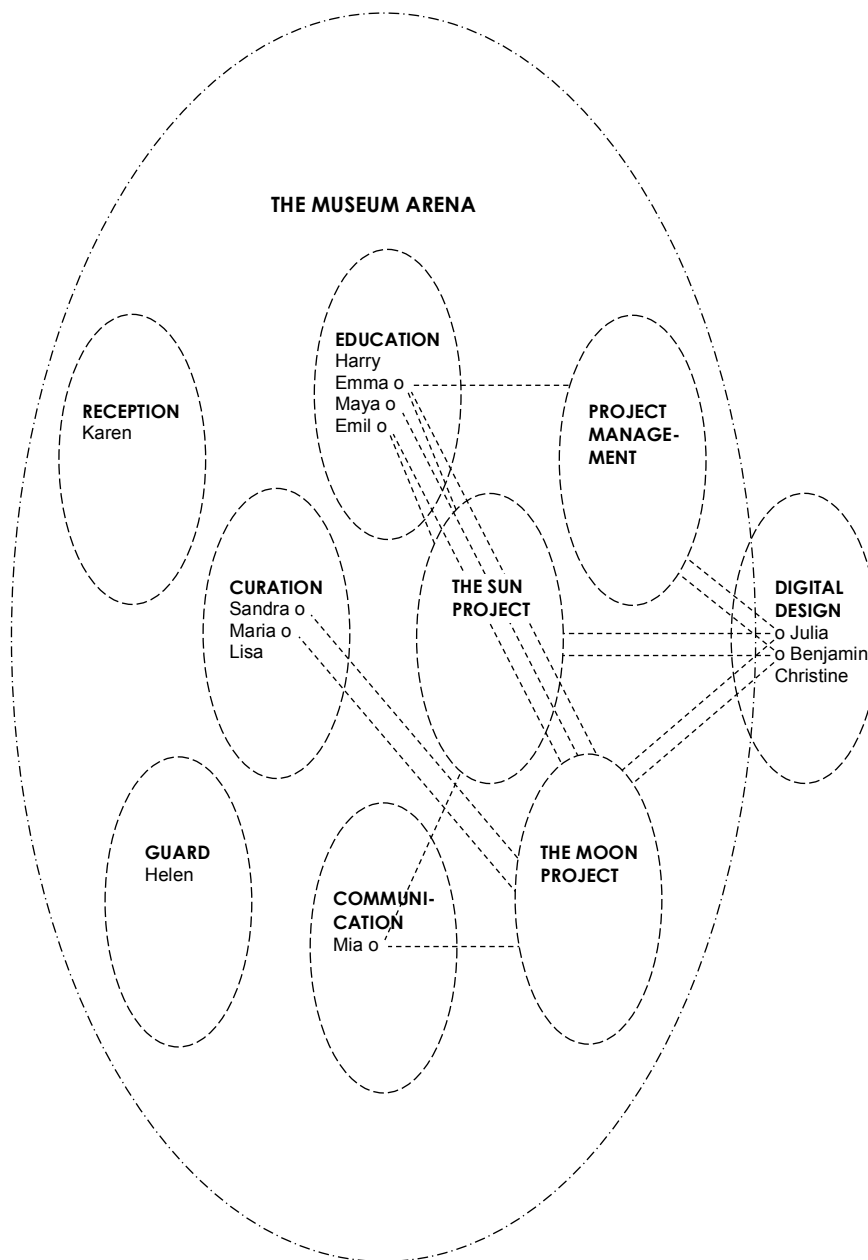
Figure 12: Social worlds/arenas map of the Art Case: The Stars Project

As visualised in the map, things get even more interconnected in the Stars Project. Also, new participants from already participating worlds and new worlds from the museum arena (reception and guard) are involved in this project.

Overall, the maps elucidate the strengthening of the connection between the social worlds of the museum and the digital design world during the three design cycles. This is visible from the dotted lines of alliances when the three maps are compared (Figure 13).
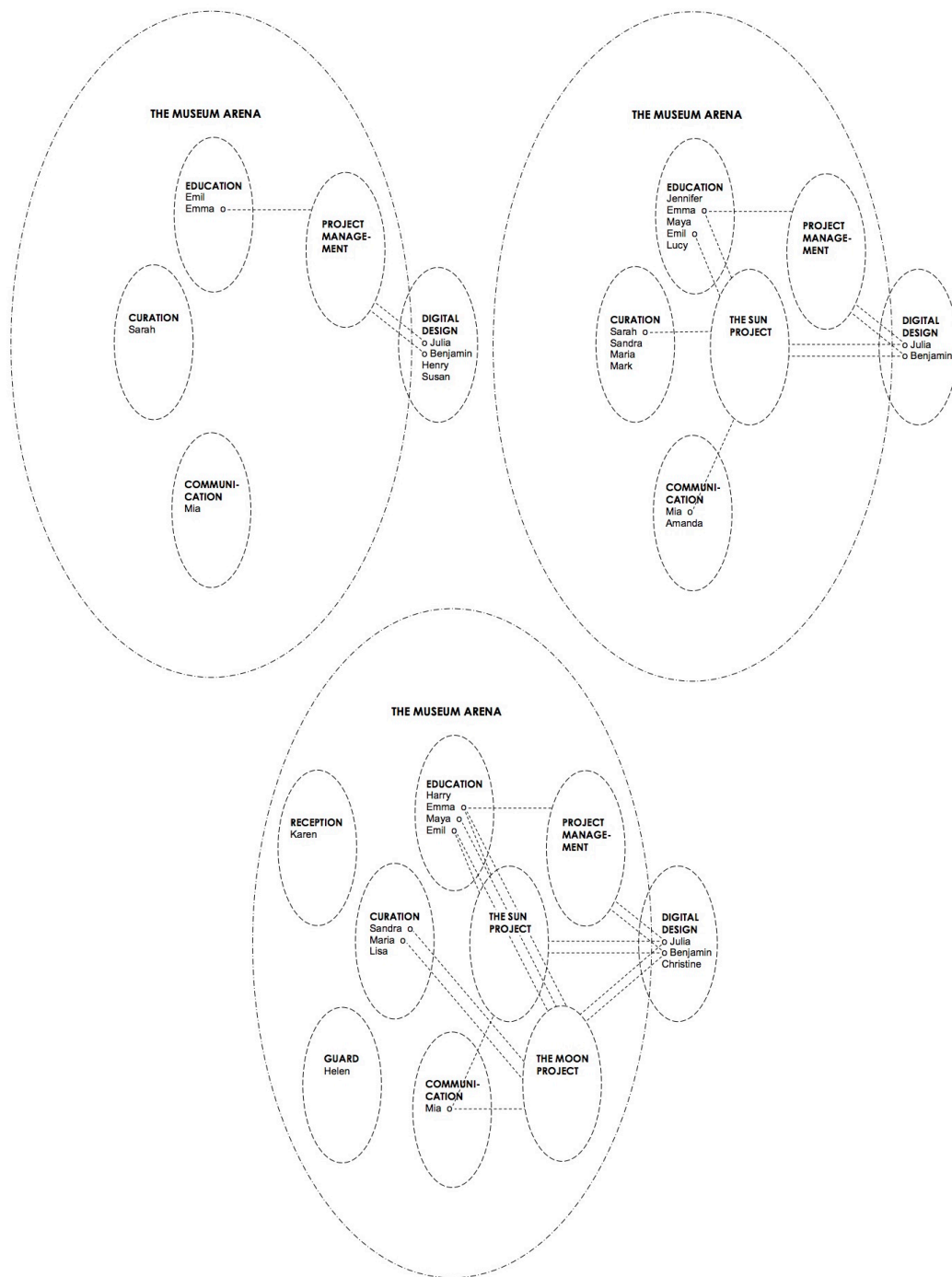
Figure 13: Social worlds/arenas maps of the Art Case: Comparison of the maps

The digital designers are increasingly integrated in the museum due to the emerging relations sustained in the cross-institutional worlds of project management, the Sun Project and the Moon Project. However, the number of participating digital designers is significantly lessened during the process while the number of museum staff is increased, filling up the museum arena. In the Sun Project, the participation of museum staff versus that of digital designers is fifty-fifty if we count heads (4 to 4). In the Moon Project and the

Stars Project, new museum worlds are involved and many more museum people participate (11 to 2 in the Moon Project and 10 to 3 in the Stars Project, respectively). Even though this is a very simplistic representation of the complex evolving connection between the social worlds, it showcases some of what happens and highlights a change worth exploring further.

4.1.2. Social worlds/arenas maps of the Cultural Heritage Case

Even more so, this change is worth pursuing since something similar happens in the Cultural Heritage Case. Before I showcase this in the social worlds/arenas maps of the Dawn Project and the Dusk project, a brief explanation of a notable difference between the Art Case maps and the Cultural Heritage Case maps is important.

When I first tried to map out the worlds in the Cultural Heritage Case, I structured them in relation to the museum arena as in the Art Case. It quickly turned out to be a less fruitful approach since the existing museum played a minor role in this project. Instead, the epicentre of the discussions was the new non-existent museum, which is positioned as the main arena in the subsequent maps. The project manager, Alex, helped me realise this in response to one of my earlier maps in which I had placed project management as part of the museum. On the contrary, he described himself as a kind of Indiana Jones searching for the holy grail of museum making by interconnecting inputs from different worlds of expertise. In the top-right corner of one of my papers, he made the drawing inserted as Figure 14 to illustrate how travelling from the museum world to the design/creative world – 'from one extreme to the other' – was necessary to find 'the holy grail' (interview, 111213).
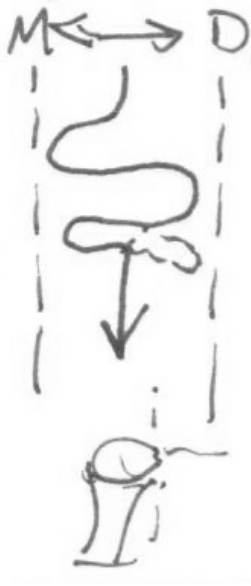
Figure 14: Drawing made by Alex (the Cultural Heritage Case)

Also, in an interview with Olivia, archaeologist as well as director of the existing museum, I realised that the existing museum did not necessarily have a say in the project:

> Olivia: I think that the municipality or the new museum project wanted to see who we were and how we worked [...] before they involved us. But it's my impression that they think we play a significant role because we will hopefully be the ones who will take over when the new museum is built. (Interview, 100812)

Alex agrees with this viewpoint, and he invites staff from the existing museum to participate in the Dawn Project, as visualised in the social worlds/arenas map of this project (Figure 15).

THE EXISTING MUSEUM ARENA

PROJECT MANAGE-MENT
Alex
Louisa

THE CREATIVE ARENA

EDUCATION
Alice
Jimmy

THE NEW MUSEUM ARENA

DANCE
Emilie

VISUAL EFFECTS
Freddie

ARCHEOLOGY
Olivia

DIGITAL DESIGN
Tobias
Arthur

ONLINE MEDIA/ART
Jonas

MUSEUM MANAGEMENT
Isaac
Oliver

PRODUCUTION MANAGEMENT
Albert

RESEARCH
Frank
Finn

PRODUCTION DESIGN
Isabella

ARMY
Tom

ARCHI-TECTURE
Hugo
Betty
Sienna

Figure 15: Social worlds/arenas map of the Cultural Heritage Case: The Dawn Project

In addition to the museum staff from the existing museum, he invites a couple of stakeholders (museum management world) and some other people. These people are very carefully selected. As Alex tells me:

> Alex: I have talked to almost forty companies and individuals and then handpicked those who made the best impression, who were most creative in their thinking, who could think mostly out of the box in terms of ways of making exhibitions. Also, those with specific knowledge about the subject were recommended in my network and have been through a similar screening. They have a specific knowledge but with an edge to it. (Interview, 092112)

At meetings and interviews, the different people are conceptualised as being part of different clusters, corresponding to what I have framed as 'the existing museum arena', consisting of the worlds of education and archaeology; 'the creative arena', consisting of the worlds of dance, visual effects, digital technology, online media/art, production management, production design and architecture; and 'others', namely, the worlds of museum management, army and research. Two of these clusters are framed as arenas since unresolved issues and disagreements appear between the social worlds within them.

When we look at the social worlds/arenas map of the Dusk Project (Figure 16), the right section of the map is almost entirely cut off.

THE EXISTING MUSEUM ARENA

DIGITAL
DESIGN
Zach
Milo
Anya

PROJECT
MANAGE-
MENT
Hannah
Grace
Alex o

EDUCATION
Alice o
Jimmy o

THE NEW MUSEUM ARENA

ARCHEOLOGY
Olivia o
Brad

THE DAWN
PROJECT

EXIBITION
MAKING
Florence
Jane
Noah

ARCHEOLOGY
Michelle

THE PARTNERING MUSEUM ARENA

ARMY
Tom o
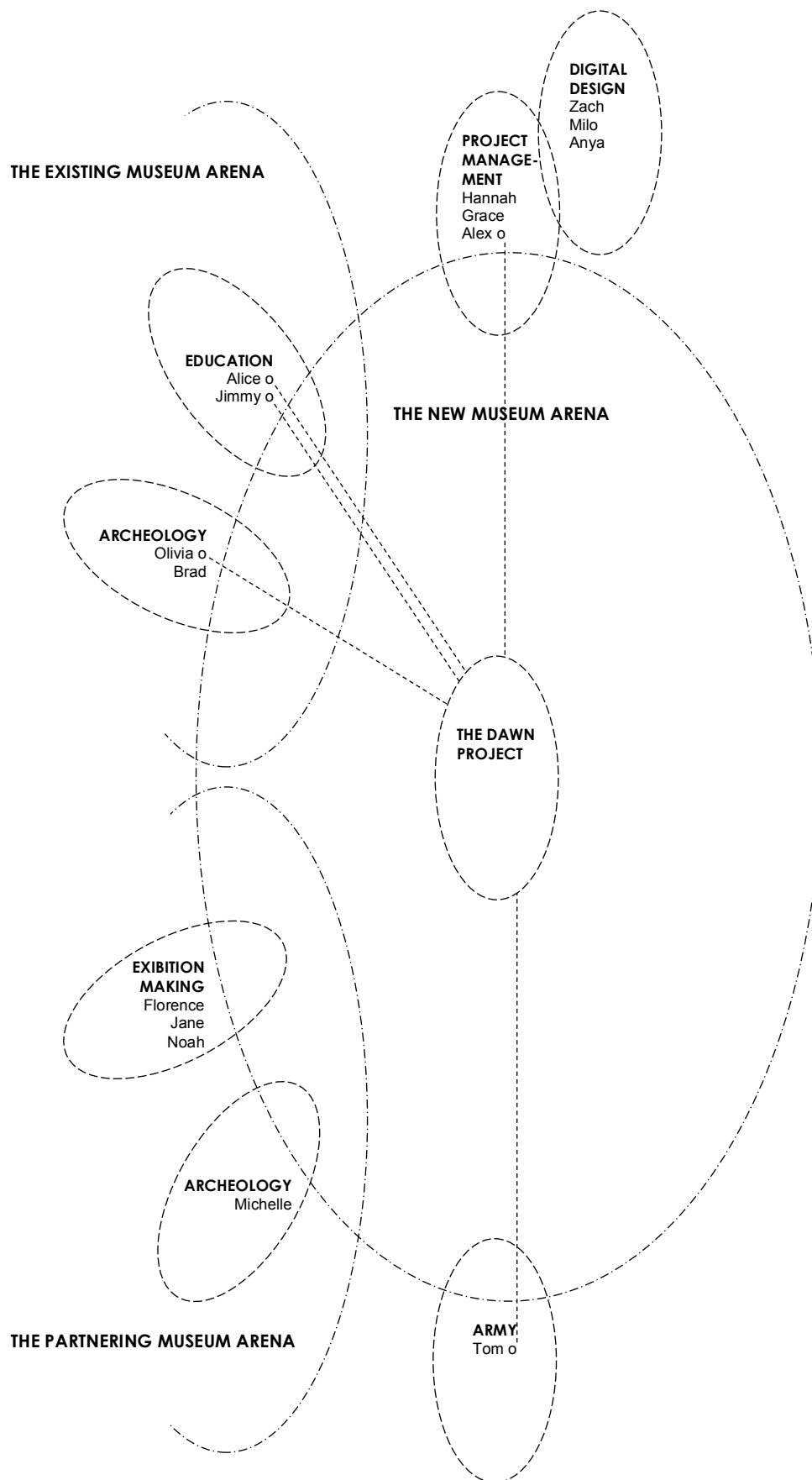
Figure 16: Social worlds/arenas map of the Cultural Heritage Case: The Dusk Project

In this project, none of the participating worlds inhabiting the creative arena in the Dawn Project is invited to participate. Research and museum management are also left out. Instead, more museum staff are involved, including one more archaeologist associated with the existing museum (a PhD student) and the worlds of exhibition making and archaeology from another museum that is now a partner in the project.

As in the Art Case, a world has emerged due to the community of practice developed during the course of the presiding process, labelled the Dawn Project. However, if we compare the Dusk Project with the Stars Project, the ties are not nearly as elaborate and as strong as in the Art Case. Also, no digital designers are part of the connection. Instead of getting more involved and forming alliances as in the Art Case, the digital designers participating in the Dawn Project are not part of the Dusk Project at all. Digital technology is now represented as a world outside the new museum arena, only connected to it through the project management world. Hence, Alex and Hannah meet informally with a couple of creative companies, one of them being a company working within the digital design area, though not the one participating in the Dawn Project. They do this to get inputs on exhibition design but these inputs are not shared with the rest of the exhibition design group. Instead, their function is to qualify the work of the project management world.

To conclude, the same tendency is visible in both cases: more museum staff get involved while the involvement of creative professionals, such as digital designers, are lessened, as illustrated by the missing right flank in the Dawn Project when the two maps are compared (Figure 17).

THE EXISTING MUSEUM ARENA

PROJECT MANAGEMENT Alex Louisa

THE CREATIVE ARENA

DIGITAL DESIGN Zach Milo Anya

PROJECT MANAGEMENT Hannah Grace Alex o

THE EXISTING MUSEUM ARENA

EDUCATION Alice Jimmy

DANCE Emilie

THE NEW MUSEUM ARENA

EDUCATION Alice o Jimmy o

ARCHEOLOGY Olivia

VISUAL EFFECTS Freddie

ARCHEOLOGY Olivia o. Brad

THE NEW MUSEUM ARENA

DIGITAL DESIGN Tobias Arthur

THE DAWN PROJECT

ONLINE MEDIA/ART Jonas

MUSEUM MANAGEMENT Isaac Oliver

PRODUCUTION MANAGEMENT Albert

EXIBITION MAKING Florence Jane Noah

RESEARCH Frank Finn

PRODUCTION DESIGN Isabella

ARCHEOLOGY Michelle

ARMY Tom

ARCHITECTURE Hugo Betty Sienna

THE PARTNERING MUSEUM ARENA

ARMY Tom o

Figure 17: Social worlds/arenas maps of the Cultural Heritage Case: Comparison of the maps

However, there is a difference between the two cases: In the Art Case, the number of digital designers participating is lessened during the process, but their connectivity and alliances with the social worlds of the museum are increased. On the contrary, the digital designers participating in the Dawn Project are cut out of the process, and the other digital designers participating in the Dusk Project have a more peripheral role in the new museum arena: they are not directly related to it and neither do they form alliances with the other worlds. Let us take a look at why this change happens by digging further into the interaction between participants, starting with the extreme example of cutting off the right flank in the Dawn Project of the Cultural Heritage Case.

4.1.3. The Cultural Heritage Case: To involve or not to involve digital designers?

Me: In what way would you say that thoughts about digital technologies were involved, if at all, in the process?

Alex: Well, yes, they have gone from having a primary to a more secondary role. (Interview, 111213)

When Alex initiates the Dawn Project, it is not yet clear if and to what extent digital designers or other creative people will be involved. I hear about the Dawn Project in a telephone conversation in April 2013 (040413). At this point, Alex tells me that they probably will involve one or two external creative people and that he is already in dialogue with a company. When I call him a couple of months later (050613), I get the same status, although he has now initiated dialogue with an additional company. Soon thereafter, the invitation for the first meeting in the Dusk Project (052213) is sent out to the participants. In this invitation, the participants are presented, and at the bottom of the presentation list is written 'Possibly 1-2 external people'. Apparently, it is still undecided whether digital designers or other creative people will be involved in the group. At the meeting, no digital designers or other creative people participate, but the issue is briefly discussed. Again, it is unclear what will happen. In the minutes from the meeting, there is a bullet list about the second subsequent meeting (to be held 062813), with bullets such as: 'Digital techniques?', 'Interaction designer?' and 'a person with knowledge about the digital possibilities?'

At the next meeting, held 061713, the participants discuss the issue more thoroughly:

Alex: At the August meeting, we imagined involving one or two external people. We talked about Anne's supervisor who knows what's happening digitally. If we were to use some exhibition techniques that... we have a couple of other external-

Florence: But isn't that too early. Shouldn't we first figure out how these themes are to be communicated, and when we know that, then we should ask an experienced digital person: 'how can we make this happen' or 'how would you suggest that we-

Alex: It might be too early; we will definitely know more about that at the next meeting.

Florence: I don't know, but I imagine that we still haven't made sufficient progress. We have only talked a bit about some things; we haven't at all-

Alex: I think that this sector, which is orientated more towards experience and creativity, will perhaps influence our prioritisation and choice of stories. If somebody says, 'this here, couldn't we do it like this?' – 'wow, yes, for sure'.

Florence: I simply don't think so.

Alex: You don't think so?

Florence: No.

Alex: Okay. (Meeting, 061713)

Clearly, Alex and Florence disagree. Florence does not want these 'external people' involved at this point. She further explains her view by referring to her prior experience:

Florence: I simply think that we are such experienced museum people that I don't think anything will surprise me. I respect their abilities, I don't know how to develop it, but I think we can ourselves imagine exactly how 'wow' it can become. We don't know how it's done and with how many projectors or how much digital programming, but still [...] I have experienced that if you leave IT up to someone else too early, their visions and ideas will be what is hung up and they may not necessarily have anything to do with the story you want to tell. And then suddenly you are left with some fancy IT that really-

Hannah: Yes-

Alex: IT is only one of the techniques; there are also a couple of others; we can call them creative-

Florence: /digital/

Alex: /people/ – in my network who can stimulate senses in different ways. And that's really the question – we can very well have the discussion now. When will it be valuable to involve them? So it's not just our creativity around this table that develops it.

Florence: But we do not at all have to be creative. I just think that we have to have, I don't know who is supposed to draw the sketches of the exhibition, but there has to be some guidelines. (Meeting, 061713)

Basically, Alex and Florence do agree that the focus at this point should be the stories, but they do not agree on who should be involved in exploring these stories. Alex clearly hopes to involve digital designers and other creative people sooner than later to push the creativity in the group. Florence thinks it is too early to be creative. The discussion continues a bit until Alex ends it by saying:

Alex: We really don't have to talk more about it now because after the next meeting in one and a half weeks, we will have made a bit more progress than today. Then we will discuss the issue again. What is the theme for the meeting in August? Should we involve others or not? What do we need? Because – as you say [to Florence] – we should work from the inside out. What are the stories? (Meeting, 061713)

The conclusion, as per the minutes sent out after the meeting, is to postpone the decision:

> 6. AD The future composition of the exhibition group
> It will be further looked into at the next meeting on June 28.

However, at the meeting on June 28, the participants do not discuss the issue. Also, they try their best to avoid talking about digital technology and other exhibition techniques, but it turns out to be very difficult, as is expressed at the end of the meeting:

> Alex: I would also like to compliment us all for succeeding in actually sticking to our 'inside out' strategy. What should be communicated? How? We almost haven't talked at all about exhibition techniques. We have talked a bit about scenography, but we have succeeded in getting back.
>
> Florence: It's because you don't know what's happening inside our heads.
>
> Hannah: Yes.
>
> Alex: Well, I must admit that I have bitten my tongue so as not to talk about exhibition techniques.
>
> Hannah: Yes, I would also say that you did a good job today of rolling it back.
>
> Alex: Because we have to be faithful to what is to be told. (Meeting, 062813)

Thus, not talking about exhibition techniques is experienced as a very difficult strategy. In their effort to stay away from the topic, they again forget to discuss when to involve digital designers or other creative people with specific knowledge about such techniques. Yet again, the issue is just mentioned in the minutes sent out after the meeting as a discussion point for the next meeting (to be held 082213): '3. External people; What do we need?'

Once again, it is not discussed at the meeting on 082213, and it again turns out to be very difficult not to address exhibition techniques. The participants have to continuously remind each other not to do so. Indeed, deciding on what they want to accomplish with the museum, the overall story, turns out to be exceedingly abstract and difficult while referring to exhibition techniques is much more concrete and therefore done quite frequently. In spite of this continual reference to exhibition techniques, the participants do not discuss whether and when to involve digital designers or other creative

people, and the minutes sent out after the meeting answer the agenda question with hesitation:

> 3. External people? What do we need?
> Pending.

The issue is not discussed further in the group, and in the end, no digital designers or other creative people are involved in the Dusk Project; they are only indirectly involved through Alex and Hannah's informal meetings. In my concluding interview with Alex, he reflects on this choice:

> Alex: I experienced that we actually weren't ready to select exhibition techniques. We needed to discuss the foundation – the object, the stories and the facts. And then we tried to talk about ambiences, which was easier to relate to. And we actually used all the time to get this foundation ready. When we started in May, we thought that... They had May, June, July, August, September and October; they had six months minus the summer holiday to get it done. I thought that we would have been ready to talk about exhibition techniques after the summer holidays. We had imagined that, but we reached the conclusion that it was less important. The foundation needed to be in place. And that was actually interesting [...] So, later we'll figure out exactly which exhibition techniques are needed. Some creative people will undoubtedly come up with some cool ideas – whether it should be a real sword or a touch screen or something else. If what is important is the story about the sword, then that should be the premise. And then some external creative people will offer their ideas in terms of how it can be done. (Interview, 111213)

As Alex concludes, the group never gets to the point where it makes sense for them to involve digital designers or other creative people. Discussing the foundation and figuring out the premise of the exhibition took much more time and was much more difficult than he had first anticipated. What we witness here can be fruitfully explained by what Strauss (2010) terms a process of defining of issues. The issue of involving digital designers in the process continuously looses importance due to an agreed shift in defining digital technology as something secondary instead of primary, even though it is obviously difficult to treat it as such.

4.1.4. The Art Case: Prioritising museum ideation

A similar scenario unfolds in the Art Case. The group increasingly focuses on the premise of developing technology and not technology as such, correlating with the increase in museum staff and decrease in digital designers participating. More concretely, this is visible in the amount of time

spent on the initial idea development in the three projects and the changing role of the digital designers in these phases.

In the Sun Project, the idea development is basically done at one meeting (030512) where four people from the museum and four people from the digital design company discuss possibilities together. At the end of the day, they have a pretty developed idea to work with, which they all agree is necessary, because the time until the first exhibition opens, the Sun Exhibition, is very limited.

In the Moon Project, the idea development is more time consuming. As pointed out in section 4.1.1, the first meeting in the Moon Project showcases contrasting ideas about the Moon App. Clearly, the idea development will not go as smoothly as in the Sun Project. The project managers decide to set up a user workshop to get inputs from potential users and, following this, to set up what Julia calls an 'internal workday/concept development' in a meeting invitation sent out before the meeting on 053012, meaning internally in the context of the museum worlds. Therefore, at this meeting, ten museum people and only two digital designers participate.

The participants first evaluate the Sun App and talk about the inputs from the user workshop. Then, the museum staff are divided into three groups where each has to come up with an idea for the Moon App. Julia and Benjamin facilitate this process. Also, before the meeting, they have prepared an idea for the app, which is presented after the three museum groups have presented their ideas. Thus, in this project, the digital designers are still part of the initial idea development, but they also have a more facilitating role in stimulating ideation within the museum. When I ask Julia and Benjamin about this change, they tell me that they actually prefer to be 'midwives helping them [the museum staff] get the idea' (interview, 090312). As Julia puts it:

> Julia: But that's also a part of our philosophy; that it's better for them to take ownership because they're the ones with the knowledge about their users and the exhibition as well as the ones with the professional knowledge. And they are the ones who should decide what professional knowledge is needed in the project. We can't just come and say; 'I think you should do this and that' because that part has to come from them. That's what results in the best projects and the best processes. (Interview, 090312)

According to the digital designers, the idea should optimally come from the museum staff. Let us return to the meeting on 053012 to see how it goes: After a great deal of discussion, two ideas prevail, but the group is hesitant about deciding which one is best. Julia asks the museum staff to meet again

and agree on what to do: 'you have to decide internally which way to go' (Meeting, 053012), as she says. The museum staff is divided into two groups that both investigate the two ideas and meet in the following week to make a decision. However, making the decision turns out to be exceedingly difficult, and the participants talk about involving the digital designers:

> Emil: What if we refine both ideas so that they can be presented and sent to the digital design company and we say: 'we have these two ideas, we are uncertain about which way to go'. So we give the ideas a form so they can understand the difference between them and then ask them to give feedback before Monday. Then we'll be able to make a choice that also takes into account what is technically possible and what is.... I don't know, but wouldn't that be a good way to proceed? Couldn't we use the time needed to refine both projects?

> Emma: Well, the challenge is that they need to have the decision on Monday. They are supposed to work with it on Monday.

> Sandra: /and also, they wanted/

> Maya: /they wanted to know what we wanted/

> Emma: Why don't I call and see if Julia is available? (Meeting, 060112a)

Emma cannot reach Julia, and the group continues talking about the options. At the end of the meeting, they agree on proposing a solution that can contain both ideas:

> Emma: Shouldn't I talk to Julia about trying to do the whole package?

> Sandra: We could also just tell her that we have these two ideas – as she knows – and a possibility could be to-

> Emma: Combine them

> Sandra: Combine them. And then she can say freely whether she thinks that one of them or a combination is the best idea. It would be totally alright if she had some other-

> Emma: But I think that-

> Emil: But we want to know why.

> Emma: Yes.

Sandra: Yes of course. And she has so much experience, so maybe she can just quickly say that it will be too messy or something, or that one idea is super good or that both ideas are super good.

Emma: Yes, we like both ideas. (Meeting, 060112a)

As in the Cultural Heritage Case, it is clearly difficult to figure out the foundation and decide which way to go. Like the participants in the Dusk Project, those in the Moon Project find it easier to base some of the abstract decisions on the actual possibilities of the concrete technologies. This does not surprise the digital designers. During a Skype meeting soon thereafter, Benjamin says:

Benjamin: I said that already when we left the art museum. They will pick both ideas. But we simply haven't got the time it takes to fully develop both tracks. (Skype meeting, 060712)

Apparently, this is not the first time that the digital designers experience indecision on the part of museum staff. This makes me wonder whether the internal discussions are basically a waste of time, and I literally interrogate Emma about her opinion in my interview with her about the Moon Project:

Emma: We had an enormously good dialogue because they of course knew that we would get back to them to ask for both ideas. And to have external collaborators who understand what you want and can cut to the bone, I think that is very good. Had it been some consultants we had hired, they might have just done what we asked for even though they knew that it wasn't the best.

Me: So you didn't feel that you wasted your time? You said that they knew that you would ask for both?

Emma: No because it was also an enormously important process to get a clearer idea about the potential of the different concepts. So it's just something you have to do; you have to spend time on it.

Me: It's part of the creative process?

Emma: Yes.

Me: Didn't you feel that the digital design company was missing at the internal meetings?

Emma: No, because they [the meetings] were really about the content. And they have competences about users and user interaction.

Me: So not really?

Emma: No.

Me: I noticed that you talked about technical stuff a couple of times when you were like 'okay, that must be up to them', and then you couldn't make a decision. Maybe it would have been beneficial if they were there? But of course, you could then talk to them about it afterwards?

Emma: Yes, because it could have perhaps closed some things down, and then it would have gone in another direction. (Interview, 081512)

Thus, in Emma's opinion, internal discussions can be valuable before digital designers become involved and 'close things down', thus echoing the discussions in the Dusk Project.

In the third and final project, the digital designers have an entirely facilitating role in the initial idea development phase. The Stars Project is initiated with two workshops, one with a broad range of museum staff (people from the worlds of education, curation, communication, reception and guard) (091912) and one with users (100312b), both to get inputs for the focus of the Stars App. The digital design company facilitates the workshops as well as an idea development meeting (100312a) with a more selected group of museum staff who have all been involved in one or more of the previous projects (Emma, Maria, Mia, Emil and Maya).

At this meeting, Julia, for instance, asks the museum staff to write post-its about and discuss the primary purpose of the app, the target group and what to prioritise. Moreover, Christine (a new participant from the digital design company) facilitates what is called an inspiration card workshop where the participants are encouraged to quickly develop a range of concrete ideas, which they evaluate afterwards. In contrast to the two previous projects, the digital designers do not participate in the idea development at all in this initial idea development phase. Instead, they collect a great deal of inputs (from the museum staff workshop, the user workshop and the idea development meeting) and then, based on all of these inputs, develop two different concepts that they discuss with the museum staff at the next meeting, taking place 112212.

Hence, the amount of time and effort spent on the initial idea development increases from the Sun Project to the Stars Project. Also, the digital designers go from having a participatory role to being facilitators in this initial idea development phase. As in the Cultural Heritage Case, Strauss' (2010) process of the defining of issues has particular relevance here. In the actions of the participants, we witness an increasing prioritisation of discussing the foundation and figuring out the premise within the museum arena, downplaying the role of digital technology in the initial idea

development. This pattern occurs both when museum staff form close alliances with digital designers, who are consequently highly involved in the projects (the Art Case), and when they do not (the Cultural Heritage Case). Thus, the digital designers are involved to a lesser and lesser degree or change their role in the initial idea development. Why is this pattern parallel in two cases that, in many ways, are so different? I explore this question further in the next section.

4.2. UNDERSTANDING TECHNOLOGY: THE INFLUENCE OF THE FUNDING SYSTEM

When I read through my data material, I notice another similarity between the two cases. In Denmark, museums typically need funding to be able to initiate extraordinary development projects. The Art Case and the Cultural Heritage Case are both highly dependent on funding, and the funding system plays a significant role especially in the beginning of the two cases, the Sun Project and the Dawn Project. In the following section, I argue that the funding system nourishes a technocentric, deterministic and fixed understanding of technology, which explains the parallel pattern described in the previous sections. To underpin this argument, let us first take a look at the Art Case.

4.2.1. The Art Case: Technology infatuation as underlying constraint

As pointed out earlier, Emma initiates the project after a conversation with the CEO from the digital design company. She writes up an application for funding and is granted funds to develop three mobile apps using technologies such as AR and pattern recognition. However, what she first expects quickly turns out to be impossible, as she tells me in an interview about the Sun Project:

> Emma: My experience is that they [the digital designers] sold the project to us in a way in which everything appeared to be possible: 'We can make pattern recognition'. And then when we got the money and got started, it wasn't possible to make pattern recognition. Well yes, you could do it with museum labels that they had produced themselves but not with actual art pieces. (Interview, 052412)

At the very first meeting of the Sun Project, the digital designers suggest a rather different solution format to the one described in the application for

funding, namely, a stationary digital table. This idea is continuously criticised by the museum staff during the meeting – with comments such as:

> I argue against it because it isn't art-piece specific. It's a table and we have promised that it will be related to the specific art pieces. I think it's a really good idea, but it doesn't at all relate to the art pieces.
>
> The way I see it, we have sold the experience as something whereby you get an additional layer to the art piece, and you don't get that if you go to a table or use a map. Then it really doesn't have anything to do with the art piece.
>
> I saw it as – I don't know how you saw it – but I at least saw it as... or the way I sold it was as something in front of the art piece. So, it's something we at least need to clarify if we choose to do something else.
>
> In the application for funding, we specified that it would be art-piece specific and that it would be activated next to the art piece. So, therefore, I argue against initially coming up with something that doesn't at all start from the art pieces. (Meeting, 030512)

A week after the meeting, I talk to Emma about the idea suggested by the digital designers. She is puzzled by this suggestion, and says: 'How could they even imagine that it could be a possibility? It obviously had to be mobile' (Informal conversation, 032812a). When I interview them about the Sun Project, the digital designers mention this issue as a constraint:

> Julia: Because it was stated in the application for funding that it should be something with AR and that it preferably should be mobile, it was very delimited in the beginning, and it excluded many other things that could also have been fun to play with. (Interview, 052112)

The result of the Sun Project is a mobile app, but the initial idea about pattern recognition manifested in the application for funding is not realised in a way that corresponds with Emma's expectations. In the end, however, Emma is happy with the result. As she tells me when she reflects on all three processes more than a year later:

> Emma: If you look at it in retrospect, they have never been able to provide what they originally promised. And we therefore get a completely different product. And it's of course based on a relation, and it's something that we accept and go into because otherwise, we would have stopped it from the beginning. But at the same time, I would like to say that I think the product we have developed is very useful and enormously easy to use [...] But it's a lot more low-tech than the original thought. And I think it's great that it's more low-tech, but when you apply for funding, it's sort of that technology

infatuation [teknologiforelskelse] that sells a project. There can be some challenges in that, I think. (Interview, 091613)

Emma uses the word 'teknologiforelskelse' (translated as 'technology infatuation') that very well captures the challenges of the funding system that she refers to. To fully understand what she means, we must investigate the Danish connotation of the word. Descriptions from a Danish dictionary and a Danish encyclopaedia outline 'forelskelse' as:

1) to be or become 'forelsket'; especially about a feeling or a state of love suddenly arisen, but often also short-lived.

2) strong infatuation, excitement, interest.[27]

'Forelskelse': state of infatuation where one experiences that another person is particularly significant in his/her life. 'Forelskelse' is often distinguished from love, which is the more durable feeling that one, for instance, experiences in relation to his/her children.

A central aspect of 'forelskelse' is that the person with whom one is in love with is not seen realistically, but in an idealised way. It is thus said that one is not 'forelsket' in a person, but in one's own image of the person.[28]

In other words, 'forelskelse' is ambiguous. On the one hand, it refers to strong infatuation, excitement and interest in something; on the other hand, it is fleeting, short-lived and has an idealistic, unreal contradictory side. By using the word technology 'forelskelse', Emma both points to the excitement surrounding technology and the fleeting, short-lived and idealistic nature of this excitement.[29]

Looking at the above citation, Emma is clearly not infatuated with technology, on the contrary, she is positive about the much more low-tech result. But as she says, it was necessary to embrace this technology infatuation in the beginning of the project: to get funding, a good, high-tech idea was needed which nonetheless turns out to be impossible to develop. Thus, the technological idea is well developed before there is money to initiate the actual collaboration with the digital design company and, as visualised above, the co-design in the Sun Project is constrained by the application for funding and the high-tech expectations underlying it.

---

[27] In *Ordbog Over Det Danske Sprog*: http://ordnet.dk/ods/ordbog?query=Forelskelse (my translation from Danish).

[28] In *Den Store Danske, Gyldendals Åbne Encyklopædi*, http://www.denstoredanske.dk/Krop,_psyke_og_sundhed/Psykologi/Psykologiske_termer/forelskelse?highlight=forelskelse (my translation from Danish).

[29] For pragmatic reasons, I hereafter translate 'forelskelse' to infatuation even though it does not capture the ambiguity of the Danish word.

Luckily, the project continues after the Sun Project. We will shortly delve into the benefits of the longitudinal and experimental nature of the Art Case, but first, let us take a look at how the funding system challenges the participants in the Cultural Heritage Case.

4.2.2. The Cultural Heritage Case: Digital technology as hype creator

Similar to Emma, Alex expresses disappointment in terms of the abilities of the digital designers involved in the Dawn Project. For instance, when I interview him about the Dawn Project, he evaluates the efforts of the creative people as follows:

> Alex: And now that it's over, I think that we have gotten some good ideas. We have discussed the themes a lot, but I don't think we have gotten the creative proposals, the good solutions, that I hoped for, to be completely honest. I haven't given feedback to the external creative people that we hired in. We have ended the dialogue in a nice way, and they have been really happy, all of them, about being involved. But I'm left with a small feeling that the creative professionals were not that creative. (Interview, 092112)

His expectations about the abilities and creativity of the digital designers and other creative people are sky high, as are the expectations about the possibilities of digital technology. More than a year later, in my concluding interview with Alex, he offers an explanation for these high expectations. As Alex tells me, digital technology had a huge role to play in the beginning of the project:

> Alex: We had a highly apparent need for clarifying concrete examples. What should it be? Should it be augmented reality in a window, or should it be a downloadable app? And I used it very much in the beginning of the project to, well, you could almost say to create hype – very consciously – because everybody can become excited about this technological thought. At the same time, it shouldn't be technology for the sake of technology. I of course knew that it should only be a technique to support the stories. But to draw the attention of the surrounding world – to get them to see that this is really an interesting project – you need to get them to dream, to be frank, as we did. Like Disney said; 'if you dream it, you can do it'. If we didn't aim high enough, we wouldn't get far enough, and we needed to get really far. So because of that, we had to be very clear about it. This kind of technology might not exist today, but it could be something like this or something like that – 'can you imagine it?', 'oh!' and 'wow!', 'that's exciting'. So the technologies have been a very strong ingredient to begin with.
>
> Me: To sell it?

Alex: Yes, to sell it, to develop it. (Interview, 111213)

Digital technology, then, is a strong ingredient in convincing others that the project is innovative and worthy of support. Again, technology is conceptualised as something that can and must excite and infatuate people with its high-tech and dream-like qualities. Without it – Alex is convinced – there will be no funding for a new museum. As he explains in the above citation, he therefore feels a need to be specific about the digital possibilities from the beginning. Thus, in contrast to the Art Case, digital designers are very much involved in the initial idea development phase before applying for funding. This is possible because the budget of the Cultural Heritage Case is much bigger than that of the Art Case, and resources are therefore made available for initiating collaboration with digital design companies and other creative businesses before the funding material is composed. The aim of the Dawn Project is precisely to qualify this material.

However, yet another factor weakens co-design in this case, namely, international rules concerning procurement and competition. In an interview, Alex explains the constant challenge posed by these rules: When a public development project reaches a certain budget, production has to be tendered. According to competition rules, all possible suppliers should be treated in the same manner and have the same knowledge about the project before procurement is initiated. Collaborating with digital design companies and other creative businesses in the early design phases therefore becomes troublesome. Both Alex and the digital designers involved in the Dawn Project are very attentive to these procurement and competition rules, and Alex suspects that the digital designers hold back on ideas because of them:

> Alex: I also think that they have been holding back a little because they are afraid that if they present too much completely new thinking and put their fingerprints on it in the idea phase, then they can be struck by the procurement rules and they cannot then bid on the job in the end. They have implied that a little. (Interview, 092112)

This suspicion is partly confirmed when I talk to Tobias, one of the digital designers. At least, it is clear that there are concerns about intellectual property rights:

> Tobias: If the project is realised with the ideas we come up with, exactly as described at this point, then we have once again shared what we do best; let someone else take credit for our ideas. And those intellectual property rights are crucial to us. That is what we are measured by at some point, so we cannot just come up with ideas and then let someone else take them. So, therefore, we need to have some kind of assurance that it won't happen. We have gotten that to some degree. You could of course say that the actual

ideas we have come up with might not be so unique and that others couldn't have come up with them. Also, it could easily be that some other ideas will be needed when the final project is developed. (Interview, 092812)

As Tobias says, the ideas provided might not be so innovative, with the fear of loosing intellectual property rights being one possible explanation. This, of course, also partly describes Alex's disappointment in terms of the abilities and creativity of the creative people participating in the Dawn Project.

In the Dusk Project, Alex wants 'entirely straight lines' (Interview, 111213) compared to the Dawn Project which is another reason – besides the one explained earlier about the focus on the museum foundation – for only getting inputs from digital designers and other creative people in informal meetings instead of involving them in the entire process. Even if he wanted to involve them, it would be problematic to do so because of procurement and competition rules.

To conclude, the manner in which digital technology is understood in the beginning of both cases is arguably influenced by the funding system. The project managers find it necessary to display technological infatuation and hype to 'sell' a project and get the required funding. In the Art Case, it is not possible to begin the actual collaboration before the funding is granted, thus constraining ideation and co-design in the Sun Project. In the Cultural Heritage Case, the larger budget for initiation makes it possible to collaborate with digital designers before composing the funding material, but because of this larger budget, procurement and competition rules potentially weaken co-design. In both cases, the defining of issues is an important process that, whether museum staff form alliances with digital designers or not, results in an increasing prioritisation of discussing the foundation and figuring out the premise within the museum arena(s) in the projects following the Sun Project and the Dawn Project. This might be what is really needed in contrast to what is perceived as demanded – a need for demolishing hype, infatuation and 'the technology monster'?

4.3. DEMOLISHING HYPE, INFATUATION AND THE TECHNOLOGY MONSTER

In this section, we continue the story from the perspective of the digital designers in the Art Case:

Benjamin: In that way, we like to imagine ourselves as part of the museum. Due to the dialogue we have with them and the fact that we get to know them throughout the process, we sort of become an in-house department. So it feels natural for them to come to us with issues as if we were some of their employees in an IT department.

Me: Why is that an optimal model?

Julia: Well, because that's what changes things. Originally, the brief was to develop mobile communication / but now /

Benjamin: With AR

Julia: With AR. And what do we have now?

Benjamin: No mobile and no AR.

Julia: We have no mobile and no AR. But we could of course have just said 'fine, we'll devise a mobile solution'. And they could have made the design, and we could have developed it technically. But that's not the kind of company we are.

Benjamin: That's the traditional advertisement-like way to do it, and that just doesn't work-

Julia: -in a world like this.

Benjamin: This kind of solution just demands a deeper understanding of the museum, the users and so on. [...] The advertisement-like way I talked about before is mostly about selling a product. It works in relation to other things. There are entirely different psychological mechanisms at play, and we have very strongly experienced that it just doesn't work here.

Julia: We have of course taken part in projects in which we are much less involved and it's not-

Benjamin: -and we do that all the time. Some people are just not ready for this. There are some museums that most definitely are not ready to let us step over their threshold. It's okay that we come to have a meeting, a start-up meeting, and to meet midway in the project and the like. But we cannot interact in that way; we cannot idea develop together.

Julia: No and that's also what we find difficult. If we cannot change a project or if we on the basis of our expertise say 'this might not work' or 'maybe we should' and if that is not met, it will become a frustrating process for everybody because then you don't hear each other. And, therefore, we actually prefer to have that role; that we want to solve an assignment, but we would like to do it in collaboration with the museum. That's also what has

been good here; it has been such a long process with more than one project that has just developed positively.

Benjamin: Ideally, if it was logistically possible and so on – it isn't – but if it was, I would rather sit over there and make it. Then I would like to move us in-house for the idea development in a week or something like that; 'we stay at your place while we develop it'. Unfortunately, it's impossible to get everything to work out, but it would be the best. It would give a much deeper insight into a lot of things. (Interview, 040813)

The above excerpt derives from my concluding interview with Julia and Benjamin who point to several issues in terms of the integration between the different social worlds in focus. Firstly, Julia and Benjamin talk about the need for a deep integration with and understanding of the museum. Secondly, they note the difficulties of stepping over the museum threshold to obtain this. And thirdly, they reflect on the potentials of total integration with the museum. In the coming section, I trace these themes in statements from both cases as well as the supplementary cases to highlight a perceived need for understanding technology in a dynamic and constructivist manner in order to develop meaningful digital museum communication.

4.3.1. The need for a deep integration with and understanding of the museum

Julia and Benjamin use the phrases' 'in a world like this' and 'other psychological mechanisms' to distinguish the museum context from a traditional commercial context. As they say, a deep integration with and understanding of the museum is needed to develop 'this kind of solution'. The digital designers participating in the Dawn Project of the Cultural Heritage Case echo this view. When I ask Tobias about their role in the project, he says:

Tobias: The only right thing they [museums] can do is to include a lot of technology because that is just the way the sun, the moon and the stars are positioned. So in that way, I think we have… not a more important role than some of the others, because I actually don't think it is more important, but it's just a really important piece of making a museum. [...] I say it in a weird humble way, but that is because I don't think that what we work with is super cool.

Me: What does that mean?

Tobias: Well, it means that I think that many museums or companies place their money in the wrong place; I don't always think that… Well, technology for the sake of technology is just completely wrong. You should develop it because it actually gives a better experience or a better understanding of something or a deeper meaning [...] I think it is something you have to

141

consider quite carefully – how relevant is it? Is it better with a screen on the wall than a poster? (Interview, 092812)

The changing view on technology is striking. In the citation, Tobias goes from talking about technology as hype, as 'the only right thing' to do for museums, to talking about it as 'wrong' if it is performed exactly because of that. Clearly, his thoughts on technology are influenced by the logic of technology infatuation, but reflecting further, he demolishes the act of making 'technology for the sake of technology'. Instead, technology should only be made if it provides a better understanding, a deeper meaning. He even questions the relevance of developing technology for museums. This humility expresses the desire of the digital designers for a deep integration with and understanding of the museum context, amplifying them to develop meaningful solutions and not superficial ones with hype as the main attribute. According to this perspective, technology should not be seen as a specific, fixed object but as something that is developed within a context, supporting instead of dominating the museum.

When I interview the two project managers in the concluding interviews, they also point to the need for understanding technology in a more dynamic and contextual way. For instance, Emma stresses that long durability is more important than fanciness in a museum context:

> Emma: Sometimes I think about whether it's simply too expensive, since technology develops and changes so fast, and whether we should jump onto that wave. How long does it last until you have to produce something new so it won't be entirely out-dated? So I sometimes think about whether the resources could be used for something better. But at the same time, I think that what we have created – not the first ones since they were exhibition specific – but what we have created now has a long durability. [...]
>
> Me: So, when you develop technology for a museum, you could say that you should be particularly attentive to creating technology with long durability?
>
> Emma: Yes, and at the same time, museums are places that are willing to experiment and try things out but there just aren't that many resources to develop something that is totally fancy. (Interview, 091613)

According to Emma, digital museum communication has to be meaningful and long lasting since it cannot be either 'totally fancy' or replaced every year. Alex uses a concrete example to illustrate this issue:

> Alex: So therefore, it would be a short-sighted strategy to make a 3D cinema with a film about Vikings if the primary strength of the movie was the 3D effect. Then it would quickly become boring. If the primary strength was the

insight into the Viking era, it would work for much longer. (Interview, 111213)

In sum, the participants highlight the need for a deep integration and understanding of the museum context in order for digital designers to develop meaningful digital museum communication. These insights add further to the explanation for increasingly prioritising to discuss the foundation and premises and not technology as such.

4.3.2. Stepping over the museum threshold and hitting the road together

Collaborating with museums to develop this deep integration and understanding is, however, not always easy. As Benjamin puts it, 'some museums are definitely not ready to let us step over their threshold', making it a non-dynamic and frustrating experience for digital designers. At a meeting in the Stars Project, Benjamin introduces an app he helped create with and for another museum as inspiration for developing a structure for the Stars App. He presents this app, called the External App, and continues:

> Benjamin: It's very comprehensive, but it's just to have an example in relation to permanent collections. We made it, or actually, it was an example of something that was a bit too far advanced when we got involved in it.
>
> Emma: They had already structured how it should be?
>
> Benjamin: Yes, and there are some shortcomings in that. It's not at all to point fingers at them but we can use some of the experiences from that project. It could have been made radically different. And that's also one of the reasons we want to be there when you make the considerations about the content today, to hear your internal discussions so we're on the same track. Because in this case [the External App], we came and they had already finalised the content and said: 'we want this and that structure for it'. And when we said that it might not be the most optimal structure in relation to user interaction, they said 'we cannot change that now because the content has been finalised'. And I think that there are some obvious issues in the solution that could have been designed much better if some of our considerations had been involved a bit earlier. (Meeting, 010313)

The digital designers are not necessarily interested in participating in what Benjamin revealingly calls 'internal discussions'. Rather, they just want to hear the discussions to better understand and be able to influence the product development with their technological knowledge and knowhow. Their intention is to learn and co-evolve, not to dominate the process. Museum staff, however, have indeed experienced dominating digital designers, as we have heard earlier on in this story, thus recalling Florence's

comment in the discussions about whether to involve digital designers in the Cultural Heritage Case:

> Florence: I have experienced that if you leave IT up to someone else too early, their visions and ideas will be what is hung up and they may not necessarily have anything to do with the story you want to tell. And then suddenly you are left with some fancy IT. (Meeting, 061713)

One phrase is of extreme importance in this citation: 'leave IT up to someone else', a phrase that I will get back to shortly. At this point, the citation serves to further unravel the decision to not involve digital designers or other creative people in the Dusk Project. The disagreement between Alex and Florence in terms of involving these 'external people' has quite an impact on Alex as he later tells me in my concluding interview with him:

> Alex: In an ideal world, I would have liked to involve some creative people. And there were two reasons [for not doing so]: Firstly, because of these procurement rules and, secondly, because I pretty quickly experienced that they would ruin the group dynamics. At the very first meeting, Florence said – I can't remember the exact words – but her words were something like 'do you really think that there is anyone better at doing exhibitions than us?' And I was like, 'yes, as a matter of fact, I do; I actually know it'. But it was another world, so I could just feel that, okay then; we really have to tread carefully here. If we want to get the best out of them, we must not threaten them. (Interview, 111213)

Florence's reaction makes Alex aware of the possible threat that these external people pose to the museum staff. In order 'to get the best out of them', he prioritises to ensure that the museum staff feel secure. He further explains this to me by comparing the collaboration to a car:

> Alex: The museum drives in a very slow tempo, and the designers can drive in a much higher tempo, just like other commercial partners. And this means that if you imagine this as something that is supposed to drive and these people [museum people] hit the brake all the time, it would just turn around in a circle; the car would just drive around the museum. It would never change. So, therefore, we have to slow down and drive in the museum tempo to move forward [...] If you drive a car with one tyre that is a bit flat, it will turn right. And it's not to say anything negative about the museum, but they are the ones driving slowly; that's just how it is. And, therefore, it's no use if the other tyre is a super cool, pumped-up tyre that just rumbles onwards. Then you just turn around yourself and move to the right. So you can pump the museum tyre a bit, and you can slow down a little and then you can move forwards. (Interview, 111213)

From Alex's perspective, digital designers and other commercial partners work at a high pace and to 'move forward' together, patience and immersion are required. According to the participants in the primary cases, this, however, demands something from both sides. To develop meaningful solutions, museum staff have to allow digital designers to step over their threshold, and when inside, the designers should not dominate the process and 'run away' with it.

4.3.3. Complementary views from the supplementary cases

In the opening citation to this section, Benjamin talks about an ideal situation of 'moving us inhouse' in the concept development phase. I got curious about that idea and decided to investigate it further. I heard about two cases in which digital designers and other creative professionals were hired so the exhibition development was primarily located in-house. The two cases are approximately the same size as the Cultural Heritage Case, also developing brand new museums but being at a later stage in the process. At the time of my interview with key persons from the supplementary cases, they were about to open the new museums. Like in the Cultural Heritage Case, digital technology had a major role to play, but it was seen as one element among other creative exhibition techniques.

In the one case, I interviewed Rebecca, a curator in charge of exhibition development for the new museum. She is an archaeologist who has worked with exhibition making and museum communication for many years. In the other case, I was encouraged to talk to two people: Matt and Luke. Matt is production manager, having worked with production in the film industry and at museums for several years while Luke is a designer, working with design and exhibition design management at the new museum. Though not done intentionally, I was lucky to get insights from two different perspectives: from Rebecca who has deep roots within the museum world and from Matt and Luke who are more rooted in the creative world.

In interviewing Rebecca, Matt and Luke, I was particularly interested in one question: Did this integration result in another model of collaboration than the one we see in the final projects of the Art Case and the Cultural Heritage Case?

In the one case, Matt explained their process as follows:

> Matt: So we have sort of worked with a model where we first empty the head of the museum professionals [...] Then we had all the professional content; there was an entire room full of stories. And then we said goodbye to the

museum professionals and put on our 'communication glasses' and tried to see if we could connect the stories in one big narrative that would be interesting from a business perspective, a communication perspective and so on. And then we suddenly had all of these themes boiled down and together to a very concentrated lump. Then we involved the museum professionals again and said: 'we have decided that this is what we should continue with; now we need your concrete inputs'. (Interview, 111413)

Initially, the focus was on the stories and the knowledge of the museum staff. The creative professionals reworked and combined this 'drained' material that the museum staff were then asked to further enrich. At this point, digital technology and exhibition techniques played a secondary role; instead, discussions about the foundation and figuring out the premise were central. As Luke tells me:

Luke: The most important thing is that you have a clear concept and a good story to tell and that you have a well-defined idea about how you want to tell it. You may want to tell it with shadow plays or cardboard puppets or something digital. But the digital is really just like a pencil – it's similar to using... it's just something from the toolbox. The digital becomes such a big monster. Maybe we need to throw it away and focus on what we want to communicate and what we want to tell. Indeed, the digital is smart and it has many features – maybe we should use it in this or that way – and it is used in more and more places. But that is not what's important. It is not important whether it is digital or analogue. What is important is if it can support what we want to tell. (Interview, 111413)

So, 'boiling' the themes down and together was considered primary while digital technology and other exhibition techniques were secondary and only relevant in terms of how they supported the themes. Luke revealingly calls the digital a 'monster', something big and out of control that we need to 'throw away'. What's important is not that technology is 'smart' and 'used in more and more places' but that it 'can support what you want to tell'. Rebecca is also very concerned with these issues:

Rebecca: The digital should be seen as a tool to communicate certain messages and stories. It should not be seen as a crucial packaging but as something secondary in a way. So much bling is being made that gets you to think 'wow, what a cool installation', right? But there is just not enough substance in it. And our audience is demanding. (Interview, 120913b)

Digital technology might infatuate you as 'bling', but according to Rebecca, it is just not enough in the museum context. Therefore, Rebecca and her colleagues worked very carefully with developing exhibition premises that could guide the development. As Rebecca explains to me, they arranged a workshop facilitated by an external consultant to cultivate these premises

within the museum before digital designers and other creative professionals were hired, resulting in a range of idea sketches further developed when presented to the new, creative employees:

> Rebecca: We presented idea sketches for each period or theme and said: 'these are the premises under which we work and you can of course comment on it and influence it' [...] We often ended up in situations in which some of them [the designers] designed a structure that looked good but where we as archaeologists had to say 'why do you want this structure and what story does it tell in relation to the theme?' And then it had to be remade. But that also meant that we needed to find some extraordinarily wonderful and capable people with so much faith in their own professionalism that they can downplay their own importance and see this as a shared work, that it is a shared product that we develop. The museum has the final cut, not the graphic designer or the architect. They cannot have that because we are in a museum. And this is what happens in many places when exhibitions are created. You can see that the designer or the architect has run off with it. The museum professionals haven't enforced their perspective and have not been sufficiently ambitious. They have left it up to others. Here, everybody knows the premises underlying our work. (Interview, 120913b)

Thus, according to Rebecca, the museum has to have 'the final cut', the content and the goal of presenting it have primacy, not digital technologies or other exhibition techniques per se.

The supplementary interviews complement the viewpoints uttered in the Art Case and the Cultural Heritage Case. They both prioritise a rather similar ideation model as that prioritised in the two primary cases. In this approach, digital technology has a secondary role in the initial idea development. However, they do mention some benefits in relation to in-house employment: The participants are continuously aligned in terms of 'the shared work', as Rebecca says, and Luke points out that working under the same roof makes you randomly meet each other and 'discuss this or that'. Also, when working so closely together, you can continuously challenge each other's ideas – 'until the other party thinks you're bloody annoying', as Matt says, stressing that you 'constantly work with it and you constantly change it' all the way until the exhibition opens. As such, there are benefits of in-house employment of digital designers, resulting in what Luke conceptualises as a more 'intense collaboration' (Interview, 111413).

However, hiring in digital designers and other creative people does not necessarily make the collaboration between the different worlds easier. Matt and Luke point to the clashes between the different worlds, referring to the potentially different paces that Alex talked about in the previous section:

Luke: Many of the museum staff of the original museum had been employed for 20 years, 15 years maybe. And then suddenly a crowd of monkeys arrive, working in tempos in which everything is turned up and down and questioned. (Interview, 111413)

We also see traces of these pace-related difficulties at the end of Rebecca's reflections in the previous citation. For her, it is essential not to allow the creative professionals to 'run away with it'. In response to what Florence from the Cultural Heritage Case said earlier, Rebecca deems it important to be ambitious and take responsibility throughout the process even though it is difficult. As she later says: 'you have to do the hard work all the way through; let the design be secondary. Otherwise, it will go wrong' (Interview, 120913b). Her point seems to be that museum staff should never leave it up to someone else and should never give up the responsibility. Instead, they should have the final cut and take part in the entire process from the initial idea development to the actual construction of the design – even if it is difficult.

To further understand these difficulties, I conducted an additional supplementary interview that I will briefly present before I continue into further analysis and discussion on the conclusions drawn in the chapter so far. A Danish organisation has particular relevance in regards to this issue. The organisation is a small publicly funded institution whose aim is to support Danish museums in developing digital museum communication.

As one of the employees, Camilla, tells me when I interview her, they often broker the relationship between museums and digital designers and therefore have solid experience in terms of the possible difficulties that can arise from these interactions. Camilla touches on many of the issues we have already encountered in the above text. Of particular interest, she explains the difficulties in terms of what she calls a 'process of maturation' (Interview, 120913a). Thus, collaborations have to be seen as something that matures, something being in process. Interestingly, Camilla further specifies the nature of the museum responsibility to which Rebecca alluded:

Camilla: We talk a lot with the museums about how they can also take responsibility and maintain that responsibility during the process [...] They often ask for something very specific, a touch screen or a tablet solution, but if they focused more on the need – and 'what kind of experience do we want to create for our audience, what kind of learning do we want them to take away from a visit to our museum?' – then they would have the best basis for a dialogue with the providers, whether digitally or otherwise orientated. Then they can base their talk on that and work with that together. So, museums need to be super good at defining what stories they want to

communicate. And this is what they need to take responsibility for, for the stories, their content. (Interview, 120913a)

To Camilla, museums must learn to see their value in these interactions and take responsibility throughout the development processes primarily in relation to what stories they want to tell. Likewise, digital designers must learn to 'have patience when they work with museums' since these companies and museums work at 'different paces' as Camilla says later on in the interview (120913a), further supporting what has already been said. In this perspective, maturity is generally what is lacking if meaningful solutions are to be developed, whether or not digital designers operate as an in-house department at the museum.

Thus, to sum up the viewpoints expressed in this section, co-designing digital museum communication is seen as a complex and difficult process, thus suggesting that good solutions do not just come out of the 'high-tech' blue but require hard work from everyone involved.

4.4. CONCLUDING DISCUSSION

The analytical explorations in the present chapter result in three interconnected conclusions:

Firstly, we see a parallel pattern in the two primary cases. In the initial idea development, the participants increasingly prioritise to discuss the foundation and premise of what is being developed within the museum arena(s). Therefore, digital designers are involved to a lesser and lesser degree in the actual ideation. This happens when museum staff form close alliances with digital designers who consequently become highly involved in the projects (the Art Case) and when the opposite is the case (the Cultural Heritage Case). Also, as we see in the supplementary cases, the same model is said to be prioritised when digital designers are hired to work in-house at the museum and thus become totally integrated in the museum context.

Secondly, looking more closely at the parallel pattern, the funding system arguably nourishes the understanding of technology underlying the first project in both cases – the Sun Project and the Dawn Project. Thus, the project managers find it necessary to display technological infatuation and hype to 'sell' a project and get the required funding. They act within what can be characterised as a fixed and deterministic conceptualisation of technology, thus constraining co-design and resulting in high expectations of

and disappointment with digital technologies and digital designers in the first projects. Through processes of defining of issues (Strauss, 2010), the participants continually redefine the understanding of digital technology and the role of digital designers in the initial idea development.

Hence, moving on to the third conclusion, viewing digital technology as secondary and thus context specific and dynamic is described by the participants from the primary and supplementary cases as essential for developing *meaningful* digital museum communication. In this perspective, hype, infatuation and the technology monster are demolished. Instead, attention is given to the complexities of maturing together, of sharing work, product and responsibility, of 'getting the car' to move forward.

The views on technology presented in the present chapter are clearly manifold. To further clarify and reflect on the understanding of digital museum communication and the changes occurring, it is useful to relate these views to the continuum of technology conceptualisations constructed in the literature and theory chapter (for a reminder, see Figure 2).

Techno-centrism	Human-centrism
Discrete-entity model	Web model
Technology as an independent, external force that effects and impacts	Technology as interdependent or constitutively entangled with the sociocultural context
Determinism: Fixed, simplistic views on technology (technophilia/technophobia)	Constructivism: Flexible, dynamic views on technology
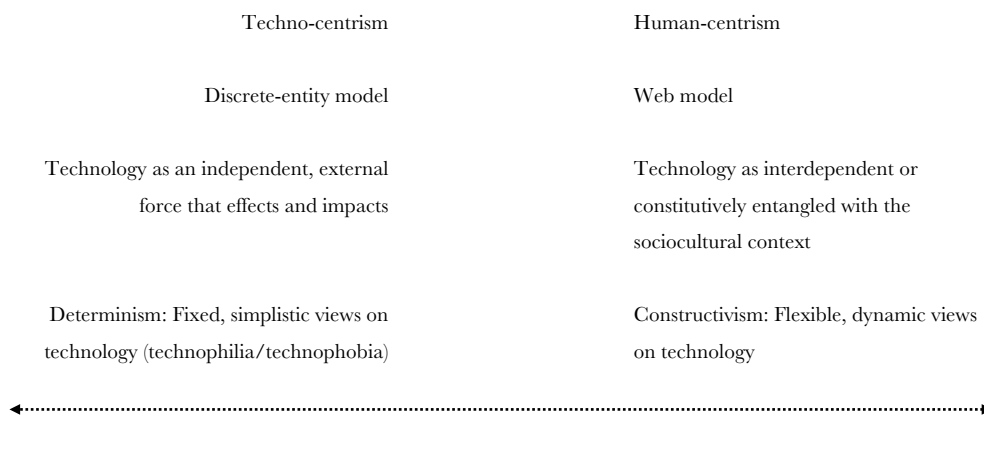
Figure 2: Continuum of technology conceptualisations (introduced in section 2.1.1)

In Figure 18, I have adapted and expanded the basic structure of the continuum to reflect the views on digital museum communication expressed in the primary and supplementary cases.

Techno-centrism	**Human/context-centrism**
Technological solutions as starting point to 'sell' a project; technology as primary; for the sake of technology	The museum as starting point; technology as secondary; for the sake of the story/communication
Determinism	**Constructivism**
Technology has special qualities that impact in certain ways – technophilic (hype, infatuation, high-tech) vs. technophobic ways (a big monster, a threat)	The qualities of technology are developed in relation to the museum context (e.g. it is better to have meaningful low-tech solutions with substance and long durability)
Weakening co-design	**Deepening co-design**
Fixing technology in applications for funding; technology as something that 'fits into a template', thus leading to disappointment and superficial solutions	Seeing technology as a dynamic, shared work, product and responsibility; design as a complex maturation process – a car with differently pumped tyres

◄┄┄►

Figure 18: Continuum of technology conceptualisations: Views on digital museum communication

The views expressed in the cases largely relate to either the left or the right side of the continuum. Of course, the continuum categorisation is simplistic, but it does adequately showcase an interesting gap between what is perceived as necessary to secure funding (the left side) and what is perceived as essential for developing meaningful digital museum communication (the right side).

This conclusion nuances the points put forward in the theory and literature chapter regarding the lack of digital understanding in Danish museums. Indeed, one may argue that there is a lacking understanding, but this understanding seems to be heavily influenced by the funding system – a system on which museums are largely dependent to be able to develop digital museum communication. This does not mean, however, that museum staff have no agency and blindly follow the doctrine of the funding system, a point richly illustrated in the developments occurring in the two primary cases. Thus, as we have seen and will see in the second part of the analysis, structure and personal agency are constitutively entangled, 'argumentative action' whirling around within a 'galaxy' of arenas arising in the most microscopic to the most macroscopic situation (Strauss, 2010).

In line with this, I find it important to stress that my intention is not to say that technology goes from being primarily informed by perceived structural conditions of the funding system to being primarily socially constructed in the interplay between the different participants. On the contrary, perceived structures and human actions influence and are continually influenced

throughout the processes, influencing and being influenced by technology in different ways. However, the perceived structural conditions are so influential in the first projects that they actually weaken co-design. The participants in the cases manage to work around the constraints due to the longitudinal nature of the cases, but in short-term projects without much room for experimentation, the consequences are arguably more problematic.

Contrary to some of the studies presented in the literature and theory chapter that simply aim to raise awareness about different levels of co-design, I follow the participants in stressing the need for deep rather than weak levels as well as the right side of the continuum in general. While some would criticise this move, I see it as a matter of taking the experience of practitioners seriously in line with my symbolic interactionist (and pragmatist) positioning. However, this also implies that I acknowledge that different situations require different approaches. As we see in the two primary cases, there are different considerations to be taken and dissimilar needs due to the diverse nature of the cases. Thus, there is no straightforward answer as to how and when digital designers should be involved in collaborative design processes, again nuancing the points presented in the literature and theory chapter. Whether sooner or later, the practitioners point to the need for a deep understanding of and interaction with the museum context in order for digital designers to develop meaningful digital museum communication. Thus, it might not be a matter of simply being physically involved in meetings in the early phases of a project but, rather, when involved, being involved deeply and having agency. Indeed, this can be done in many ways.

However, based on the practitioners' experience, I find it problematic that the funding system by default weakens rather than deepens co-design. I therefore highly recommend funding bodies supporting digital museum communication to explore alternative funding programmes. The stepped programme proposed by Clay, Latchem, Parry, & Ratnaraja (2014) – in which funding is granted for different steps of development – could be a possible alternative (introduced in section 2.2.3). However, further research should be conducted to look into these matters. Particularly, I find it pertinent to more carefully explore whether what is perceived as the way to secure funding is what is actually favoured, communicated and/or intended by funding providers.

Thus, I am aware that I very much frame the funding system as the scapegoat in the above analysis, and it is important to clarify that I do not investigate this system in itself. On the contrary, I focus primarily on the participants' reference to and experience of the system. Interestingly, the

funding providers in the Art Case actually accept the changes occurring in the Art Case. In addition, the relation to other significant worlds and arenas should not be forgotten. I am thinking specifically about the tendency displayed in the literature and theory chapter to slide towards the left side of the continuum of technology conceptualisations in Danish cultural policy discourse and the museum literature more broadly. Such tendencies may have far-reaching implications and consequences. To conclude with Orlikowski and Baroudi's notion about the relation between information systems research and practice:

> This has implications not only for the development of theory and our understanding of information systems phenomena, but also for the practice of information systems work. The findings of information systems research filter into the practitioner community and are used as prescriptions for action. Restricted and partial research thus has far-reaching consequences. (Orlikowski & Baroudi 1990, p. 8)

In sum, the analytical explorations of this chapter are relevant for museum practitioners, funding bodies as well as researchers. I will return to concrete suggestions for these diverse groups of actors in the conclusion. First, however, the third sub-research question is to be explored.

5

ANALYSIS PART 2: NEGOTIATING & CO-DESIGNING DIGITAL MUSEUM COMMUNICATION

> The negotiation of meaning is a process that is shaped by multiple elements and that affects these elements. As a result, this negotiation constantly changes the situations to which it gives meaning and affects all participants. In the process, negotiating meaning entails both interpretation and action. In fact, this perspective does not imply a fundamental distinction between interpreting and acting, doing and thinking, or understanding and responding. All are part of the ongoing process of negotiated meaning. This process always generates new circumstances for further negotiation and further meanings. It constantly produces new relations with and in the world. The meaningfulness of our engagement in the world is not a state of affairs, but a continual process of renewed negotiation. (Wegner, 1998, p. 54)

While the first part of the analysis, Chapter 4, focused on the involvement of digital designers and the understanding of digital museum communication, the second part will go deeper into how digital museum communication is negotiated and co-designed across boundaries in the Art Case. For this purpose, I deploy another mapping technique of situational analysis, namely, positional maps.

The chapter consists of two sections. In section one, I start with presenting a narrative account of what happened in the three projects. As mentioned in the methods chapter, I anchor the positions in individuals and then, afterwards, sum up the positions taken in the positional maps (see more about this choice in section 3.3.4). In the second section, I use these

positional maps to further interpret positional and artifactual emergence. As in the former chapter, the present chapter ends with a concluding discussion connecting the dots and further reflecting on the conclusions presented.

5.1. NEGOTIATIONS IN THE ART CASE

According to Clarke (2005), 'the basic (often but not always contested) issues' in the situation of inquiry are to be 'elucidated from the data' (p. 128) when making positional maps. Throughout the Sun Project, the Moon Project and the Stars Project, there are naturally many issues that are continually being negotiated. To name a few recurring themes, the participants debate whether or not the designed solutions should be interactive, whether they should be for individual or social use, whether they should be centred on specific exhibition elements or more general issues, whether the aim of the designed solutions was to provide information or fun and so on.

After a significant amount of analysis (further explained in the methods chapter, see section 3.3), I decided to focus on two issues, namely, negotiations about whether the solution should be simple or complex and whether the solution should be designed with a narrow or a broad and multifaceted target group in mind. In my preliminary analysis, these issues stood out as essential, both in terms of continually being negotiated throughout the projects and in terms of being intertwined with the digital museum communication being developed. Interestingly, the two issues are increasingly entangled by the participants, correlating in a spectrum between two design options: on one hand, the option to design a simple solution with a narrow target group in mind and, on the other hand, the option to design a complex solution with a broad and multifaceted target group in mind. The participants have contrasting views on which option to follow and continually discuss the quality (good vs. bad) in terms of these approaches.

As displayed in Figure 19, I have thus framed one axis of the positional map as ranging from designing a simple solution with a narrow target group in mind vs. designing a complex solution with a broad target group in mind. The other axis is framed as ranging from judging the quality of the solution as good vs. bad if one or the other design approach is followed:

Complexity/
broad target
group

Simplicity/
narrow target
group

---   Quality of the solution   + + +
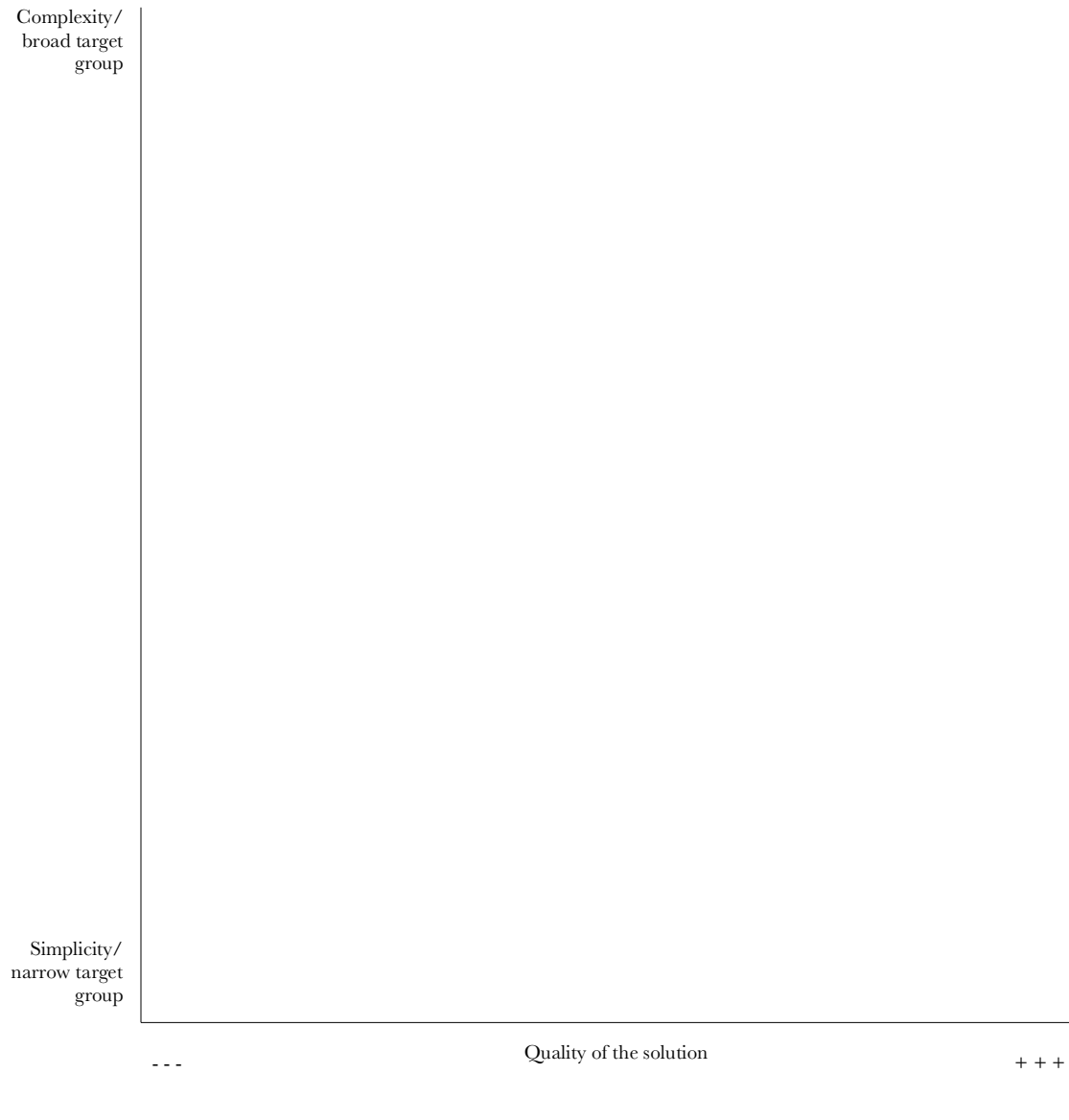
Figure 19: Positional map without positions

In the next sections, I present three maps with these axes, one for each of the three projects in the Art Case. In a sense, they are quite static representations of what happens. Yet, they provide a useful overview of the on-going interaction and emergence of positions that I then explore further. Compared to Clarke's traditional framing of positional maps, the advantage of my version is the attention given to change instead of stability, thus serving as a rich tool for analysing temporal complexity. The first task is, however, to illuminate and map the negotiations, starting with the Sun Project.

5.1.1. Negotiations in the Sun Project

My initial encounter with the participants in the Art Case takes place at the first meeting of the Sun Project.[30] Not long after the meeting has commenced, Benjamin makes a case for simplicity in the design:

> Benjamin: When you squeeze things into an app that are basically irrelevant, it actually confuses more than it benefits the user. (Meeting, 030512)

Benjamin takes the viewpoint of the user, arguing that the solution should not be too complex because it will confuse the user. A couple of minutes later, he expands on the argument for simplicity, stating that the technological solution format promised in the application for funding, a mobile solution, limits the possibilities:

> Benjamin: You're forced to cut to the bone; you can't make a digital solution with thousands of different options because it will be unclear on a mobile phone due to the very small screen. And that's really a nice thing since it's a very good exercise to find out what's basically important – what do we actually want to communicate? – and then wrap it up appropriately. (Meeting, 030512)

No counterarguments are uttered at this point. However, a couple of minutes later, Emma mentions that she often finds the form of digital solutions to be 'too monotonous' (Meeting, 030512). Much later in the meeting, the participants return to this issue as they talk about a mobile application that the design company has developed for another museum (called the External App):

> Emma: To play the devil's advocate, I thought the External App was pretty boring after having used it twice; then you didn't bother to use it anymore. So that's also why it would be good to work with two different layers even though it makes it more complex. But I don't know-
>
> Susan: -but you don't see the same things each time.
>
> Emma: No, I know that, but either way the structure makes it boring; when you have tried it, you have tried it. [...]
>
> Benjamin: But then you would have to work with fifteen different layers to make it exciting.
>
> Emma: No, no, no, I was just thinking that-

---

[30] The participants had met once before at an introductory meeting about all three projects (before I started following the project). The meeting mentioned here initiated the first project, the Sun Project (030512).

Benjamin: -two different layers wouldn't solve that.

Emma: I just think that it's important to discuss whether it's enough to walk only one way. If we have the energy, I would like it if we could at least try to work with two different ways because-

Benjamin: -we have experienced that it's definitely best to walk only one way and do that really well and use all the energy on walking only that one way. (Meeting, 030512)

Different viewpoints on the issue about simplicity vs. complexity are uttered in this discussion. Referring to the External App, Emma argues that the structure of the solution should not be overly simple so as to avoid making it a boring experience for the user. At least, she deems it important to 'discuss whether it's enough to walk only one way'. In response to this, Benjamin clearly states his view ('we have experienced...') that 'walking only that one way' is best. Henry (from the design company) ends the discussion with a mid-seeking position, arguing that the solution will become complex under all circumstances, whether it is good or bad:

Henry: We're trying to figure out the overall approach, and there'll definitely end up being lots of layers, so we don't need to have more than one overall approach. And that's important because when we develop it, there'll probably be 20 things that you want to include and that we have to say no to due to the limited time. That's at least what we normally experience. So we'll get there. We already have the image decoding, the map and the artists; that's three layers already that will provide some complexity. (Meeting, 030512)

In the negotiations on simplicity vs. complexity, the imagined use situation is both an argument against complexity (complexity is confusing for the user) and an argument against simplicity (simplicity is boring for the user). In between the negotiations, the participants more concretely discuss these potential users of the solution. Emma anticipates the discussions in an e-mail sent to the other participants before the meeting. Among other things, she mentions the plans and thoughts about involving potential users in the design process, referring to the application for funding in which they have promised to involve two particular user groups (called focus groups):

We have planned the involvement of two focus groups: the members club and the young art students. The workshops should preferably take place in week 12 or 13 (the young art students will be at the museum on Tuesdays from 15:00 to 17:00 pm and Wednesdays from 16:00 to 21:00 pm). We need to clarify how we want to work with the focus groups. In the application for funding, it says: the task of the focus group participants is to generate

questions about the art pieces that can serve as the basis for concrete content production.

To return to the meeting, the conversation turns towards the potential user soon after Benjamin's first arguments against complexity:

Emma: If we take the playful approach, it'll probably appeal to certain kinds of users. And then we might have to walk the line in terms of satisfying them. Then you appeal to them and not to other kinds of users. So, we could also work with something like that, I think.

Henry: Can you say anything about the kinds of users you expect to visit the Sun Exhibition?

Sarah: Yes, well, like we have talked about, it would typically be our young art students with whom we would like to conduct a user workshop with or some sort of start-up investigation to find out what they would like and get some insights into the kind of experience they would like. The young art students, how can we segment them, well, they are 18 to 24-

Emil: -15 to 25 years old and come from homes with more books than TV channels.

Sarah: Yes, that's one of them, and the other is our members club which, in a way, is a kind of perennial ghost that we always have to consider, a bit of a drag to be honest [the other participants laugh and mumble]. Indeed, they really are a corner stone in our visitor group, but I sometimes think that we lack consequence in terms of walking the plank and doing something for someone specifically and not for everybody.

Julia: But that, I think, is also a consequence you have to consider because we work with digital communication. As we have talked about before, we cannot make a digital solution that appeals to everybody so you have to dare to make a choice and maybe that could be quite refreshing actually. And then we can work with another target group in the next project. And actually, I wanted to ask you, because you want to involve two focus groups now, but are they the target group you want to communicate to? Are they the end users as you define them?

Emma: I have mostly thought of it as a test to see how they respond to this. And nobody says that they have to be the target group. I think that the young art students could perhaps be the target group, but then we also involve the members club to see how they respond to it, what their opinion about it is. Does it appeal to them or doesn't it appeal to them at all? More to like-

Sarah: -and also for the benefit of the following projects-

Emma: -also basically to find out whether they have different interests or if that's just something we assume [...]

Henry: It's a challenge that you have planned the user involvement to be around the end of March. Then we can't ask them and make something afterwards. We can't do that. But we can have an idea about what we want to ask them in the sense that we can test and correct a concrete idea that we then develop.

Emma: That sounds great. I just thought about how we can realistically involve some target groups and what works. So that's the proposal. And then we might do something else in the Moon Project. So, basically, we try something out and gain some experience from it. (Meeting, 030512)

When Sarah (a curator from the museum) answers Henry's question about who is expected to visit the exhibition, she points to the focus groups mentioned in the application for funding: the young art students and the members club.

The two groups are quite diverse – the young art students vs. the members club which consists largely of middle-aged and elderly women. In Sarah's utterances about the members club, we see ambiguity in terms of the issue about designing for a narrow vs. a broad target group. On the one hand, she argues that they should ignore the members club in the design and should instead be 'walking the plank and doing something for someone specifically and not for everybody'. On the other hand, she uses metaphors of danger when talking about the issue: 'to walk the plank' is pirate slang for certain death, and the members club is referred to as 'a perennial ghost', something that the museum is haunted by and cannot easily escape from. In the first sentence, Emma is similarly vague about the issue, alluding to courage ('And then we might have to walk the line in terms of satisfying them') and later in the meeting, Sarah talks about 'the risks of engaging strongly with very young people' (Meeting, 030512).

Even though they might see a quality in designing for a narrow target group, it is simultaneously perceived as a dangerous and difficult path, as we see in the metaphors they use in their discussions on the issue. It is something they 'have to dare' as Julia says. She questions the relevance of involving the two groups ('but are they the target group that you want to communicate to? Are they the end users as you define them?') and argues against designing for a broad target group ('we cannot make a digital solution that appeals to everybody').

Emma poses two opposing viewpoints to this in the following conversation. She first frames the workshop as a test, an experiment, to find out more

about some of the potential users, stating that what they know about the users at this point is based on assumptions. Later in the meeting, she adds to this argument by saying:

> Emma: But that's also why I thought it would be interesting to conduct the same exercise with two different groups and then find out who we appeal to with this product. Because we have assumptions about it, but we don't know who will visit the exhibition. That's always a hypothesis. But like you said Benjamin, I think we should create a concept and then test it. And then, if they say something that is completely off, we must assess whether we want to continue with the product or whether we should do what the users say, because we expect them to be the ones who will use it, or whether it's because this product is not for that target group. (Meeting, 030512)

In this sense, designing for a narrow target group is perceived as a deterministic method, something that builds on assumptions and hypotheses but that should rather be explored more carefully; will this kind of solution actually appeal to two of the typical visitor groups of the museum?

Returning to Emma's two contradictory viewpoints, the second one is related to the application for funding. In her e-mail anticipation of the discussion, the citation of text from the application for funding ('In the application for funding, it says...') points to the significance of the application. It is, as she says at the meeting, 'the proposal' that makes it possible to 'realistically involve some target groups'. In the Sun Project, the promise to involve these groups has to be fulfilled, but the limited time before the exhibition opening only enables them to involve users in testing. Later on, they can try something else, as Emma points out, again framing the workshop as an experiment ('And then we might do something else in the Moon Project').

Two additional user groups are actually mentioned in the application for funding, but they are not discussed in the meeting at all, namely, 'families' and 'school classes'. The involvement of a broad and multifaceted range of users is clearly idealised in the application for funding, thus sustaining a position in terms of targeting a broad, multifaceted user group. Julia also points to the weight of the application for funding in my interview with her and Benjamin about the Sun Project. In our conversation on the timing of user involvement, Julia says:

> Julia: In a way, you could say that in the Sun Project, it was kind of like 'we have to do it because that's what it says in the application for funding'. It'll always be my mantra that users should be involved, but it was at a difficult stage in the process. (Interview, 052112)

The workshop with the young art students and the members club is held three weeks after the first meeting (032812b). Julia facilitates the workshop in which representatives from each of the two groups are invited to test a PDF version of the developed solution on a digital device. As implied in the above citation, the workshop is 'problematic' from Julia's perspective. She further explains her view in the interview:

> Julia: It's problematic that museums are not very good at choosing their target group. And they determine beforehand the target groups with which they want to user test. But then, that's not necessarily the target group you develop for in the end. It's problematic that I conducted the test with the members club, and they were, on average, 75 years old. It just wasn't optimal at all. Especially when you haven't designed with them in mind. And on the contrary, I tested with the young art students who, likewise, weren't the target group. So the question is what you get out of that kind of user test, and I think that the most important lesson is that you have to be much more insistent in saying 'you simply have to choose who you make these things for'. In general, museums are pretty bad at that because they are obliged by law to appeal to everybody. But you can't appeal to everybody in a digital solution; you have to choose. (Interview, 052112)

According to Julia, the problem is that museums are 'obliged by law to appeal to everybody', which clashes with the possibilities of a digital solution. Building on experience, she deems it important to be 'more insistent' on getting the museum staff to choose a narrow target group to design for. The user workshop has a strong impact in terms of this. During a Skype meeting following the workshop (040312), the participants decide to formulate a more specific, explicitly agreed upon target group, as Julia writes in the minutes from the meeting:

> Due to the user workshop, the museum has chosen to focus on one target group – the creative segment 25 to 35 year olds who are well educated and crazy about new gadgets. The user workshop made it clear that neither the members club nor the young art students see themselves as the appropriate target group for such an initiative. However, the members club was rather positive about an app because they see some possibilities for getting extra information in front of the art piece. They are very literal in their approach and would like more information about the specific art pieces. The young art students liked the idea about a very factual information layer, but they didn't like the interpretational framework that a film or soundscape encapsulate the art piece in. They want to experience it by themselves. They were not at all likely to use an offering like that at a museum. Julia sends out the minutes from the user workshop. It has been decided that we continue developing the concept in its current form with the above mentioned adjustments and test the final product with the target group that we design for.

The Sun App is launched approximately a month later when the Sun Exhibition opens (051012). The result is a mobile app containing a short text about the artworks in the Sun Exhibition that can be accessed in different ways, for instance, by scanning exhibition signs (conceptualised as pattern recognition by the participants, thereby partly fulfilling the technological promises of the application for funding to make pattern recognition of artworks). A question regarding the artwork follows the text to stir reflection. For some artworks, video content is also available. Additionally, there is a social media layer allowing the user of the app to check in on Facebook and post tips relating to the exhibition theme.

In June, Emma and Maya conduct a user test with four users more or less matching the agreed upon target group (062712). The test does not have much impact on the Moon Project since the idea and concept development of the Moon App has already taken place at the time of the test. Furthermore, the findings mostly correspond with viewpoints already posited in the Moon Project group at a Sun App evaluation held at a meeting on 053012.

5.1.2. Positional map of the Sun Project

Before proceeding to the negotiations at this meeting, and in the Moon Project in general, I provide a summary of the positions taken in the Sun Project in terms of the analytical focal point. The different viewpoints and arguments presented in the above text is positioned in a positional map of the Sun Project in Figure 20.

Complexity/
broad target
group

Application for funding: The mobile solution promise limits the options

We cannot make a digital solution that fits all

Complexity is confusing for the user

Even if we choose one overall approach, it will be complex (whether that is good or bad)

Application for funding: The promise to involve various user groups

The museum is obliged by law to appeal to everybody

External App: Simplicity is boring for the user

We don't know who will use the solution (anti-determinism)

Designing for a narrow target group can be good, but it is also 'dangerous' and difficult (ambiguity)

Choosing one way and one function gives the best result

User workshop: The formation of an explicitly agreed upon target group

Simplicity/
narrow target
group

– – –

Quality of the solution

+ + +

Figure 20: Positional map of the Sun Project

In the bottom-left corner, we find positions arguing that the quality of the solution will be bad if it is too simple and narrow in scope – simplicity is seen as boring and designing for a narrow target group potentially results in an irrelevant solution governed by deterministic hypotheses (we don't know who will use the solution).

Moving upwards, the top-left corner contains the positions against complexity and a broad targeting. The quality of the app will be bad if the solution is too complex and broadly targeted because it is not possible to make a good digital solution that fits all, especially since the solution has to be mobile, as promised in the application for funding. Complexity in such a solution will confuse the user.

On the other side of the map, the top-right corner, we find contrasting positions arguing that the solution will be good if it is complex and broadly targeted since the museum is obliged by law to appeal to all members of society. This ideal is likewise manifested in the promises of the application for funding to involve various user groups.

Diving down to the bottom-right corner, we find positions cherishing a simple, narrowly targeted solution, stating that the best approach is to choose one way and one function. The participants act in accordance to this part of the map when they decide to formulate an explicitly agreed upon target group after the experience of the user workshop, thus maintaining this approach as the path to a good result.

The middle section of the map houses two positions. The one in the bottom-middle section expresses ambiguity in terms of designing for a narrow target group. The result can be good, but it is also a 'dangerous' and difficult path to choose. In the top-middle section, complexity and simplicity are seen as intertwined. Even if the goal is simplicity, the solution will be complex, whether that is a good or a bad thing, not judging the quality of one or the other.

5.1.3. Negotiations in the Moon Project

The Moon Project is initiated at a meeting held a week before the Sun App is launched (050212). The goal of the meeting is to talk about the plans for the Moon Exhibition, to share insights from the Sun Project and to discuss ideas for the Moon App. At this meeting, the participants who continue from the Sun Project to the Moon Project meet with the new participants, namely, those planning the Moon Exhibition.

As mentioned in section 4.1.1, this meet-up displays disagreements within the museum arena in terms of ideas and visions for the Moon App. These disagreements are to some extent relevant for the analytical focal point. In response to the ideas for the Moon App presented by the Moon Exhibition people, the Sun Project people continually question the underlying thoughts behind the ideas. For instance, the Sun Project people are keen to talk about the target group. As Emma for instance says, referring to the experience from the Sun App:

> Emma: We have experienced that a very specific target group has to be chosen, to whom it should appeal. So maybe that should determine the content of the app, be it high school students or fashionistas: who do we want

to choose as a target group? Because we can't appeal to all of them. And I don't know whether you have thought about any specific target groups?

Jennifer: We have talked about young people. (Meeting, 050212)

The discussion, however, quickly returns to the concrete ideas, and not long after, Maya (one of the Sun Project people from the world of education) again tries to return to the underlying thoughts:

Maya: But isn't that related to who is supposed to use the app? What would the user of the app like to know? Of course, it's simply so hypothetical to think about this, but in some way, it just has to define the content. (Meeting, 050212)

Even though it might be experienced as difficult and 'hypothetical', according to Maya, it can be good to let the target group define the content and not the other way around. Again, we spot ambiguity in terms of designing for a narrow target group. Later in the meeting, the difficulty is displayed in an interrogation of Jennifer about the rather unspecific target group she has proposed earlier ('young people'):

Emma: But who could the young people be?

[pause in 6 sec]

Emma: If you had to choose five young people, who would you choose?

Jennifer: We simply haven't defined precisely / how old our young people- /

Emma: / But please try, because we have to try to- /

Jennifer: / Well, it's more because / either we might... I think it could be interesting to address somebody that doesn't typically come here but who we think could be potential visitors, somebody who would find the content interesting and relevant.

Emma: If you had to be totally specific, how would you do it?

[pause in 6 sec]

Emma: It's just because I'm trying to / find out / how we can continue our work.

Jennifer: / yes, alright /. (Meeting, 050212)

Emma pushes Jennifer to be more specific, but it is obviously a difficult task as the pauses and speaking overlaps show. The ambiguity is also visible later at the meeting in a conversation involving Maria (one of the Moon Exhibition people), Julia and Benjamin:

> Maria: I could imagine having a very specific target group as you say, and I'm very open towards that; well, I do want to talk about it, but you really have much more concrete experience in terms of which groups might be beneficial to choose. And then I would just like it if it were visible to a broad audience; that it exists and that you can participate if you feel like it even though you're not the target group.
>
> Julia: But it's just-
>
> Maria: Like an add-on in some way; that if you're curious, well-
>
> Julia: Yes, alright, I just also think that... we have just experienced that it's extremely important to choose a target group to be able to set some criteria, and then there's what we can describe as elasticity both ways [...] I tested the Sun App with the members club, right? And that was a bit off in a way because we hadn't really defined a, well, the target group was very broad. In principle, it should preferably be everybody. And that's just a good example of the difficulty involved in designing something that, for instance, was intuitive and easy to use for them. How much should then be corrected in relation to that target group afterwards that then again would maybe exclude others? So because of that, it's enormously important to know who we design for, and also in relation to the content – how we present it – so the target group we want to appeal to wants to use it. And then it's just a bonus if others can figure out how to use it and think it's interesting.
>
> Benjamin: And most likely the majority can. (Meeting, 050212)

Maria sees the value in designing for a narrow target group, but at the same time, the solution should be inclusive and therefore visible to 'the broad audience'. To this request, Julia argues very strongly in favour of choosing one target group ('it's extremely important to choose a target group') but, at the same time, talks about elasticity. In using this term, she seeks to conceptualise target group definition as a mere tool and not a deterministic signifier for who will actually use it. In that sense, target group is an elastic concept and, even though very specifically defined in the design situation, the design can 'most likely' end up appealing more broadly than expected. Later, in an interview with Julia and Benjamin, we again talk about the challenges of working with museums that by law are obliged to appeal to everybody, and Julia refers to the elasticity concept as useful in moving beyond this constraint: 'I think that it actually works quite well to tell people,

or the museum people, that the point is not to exclude all others, that you can sort of insert elasticity in it' (Interview, 090312).

Going back to the first meeting of the Moon Project, the participants more or less end up settling on a definition of the target group as 'the covergirl segment', meaning 'young women with smartphones' (Meeting, 050212), the target group that the women's magazine called Cover appeals to. Julia, however, senses unsteadiness in terms of this target group and writes to the participants after the meeting that it is 'very important that you determine the primary target group (we've taken the first steps at the meeting)'. The museum staff must decide quickly so that members of the selected target group can be invited to a user workshop to be held on May 15.

A couple of days later, Jennifer posts a message stating that she, along with Mark, Maria and Sandra, has decided that the target group for the app is 'iPhone users between 25 and 35 years old'. Obviously, this is a much broader target group than 'the covergirl segment'. At the user workshop, the participants incorporate an even broader group since most of them are not within the age range of 25-35 (only two out of eight, the remainder being from 20 to 50 years old). Also, some of these participants do not use an iPhone, as I note in my field notes from the workshop: 'Some of the participants have 'old' phones, not iPhones or other smartphone models' (Field notes, 051512).

In the following meet-up between the Moon Project participants (053012), Julia mentions the lack of the cover girl segment at the user workshop. The goal of the meeting is to evaluate the Sun App, discuss the user workshop and develop ideas for the Moon App. When the participants talk about the user workshop Amanda, a new member of the group from the museum (social world of communication), asks who participated in the user workshop:

> Amanda: Excuse me, can I ask a question? Who participated in the workshop?
>
> Emma: There were ten iPhone users who, well, the criteria was that the participants should have an iPhone and be interested in cultural experiences. One of them works in our ticket office and she brought a friend. Then there was a vocational school teacher, so the participants were between 20 and 45 years old. And then there was-[31]

[31] Clearly, there is a difference between my notes and Emma's recollection in terms of the age span of the participants and their phones. I presume this miss-match occurs because the museum staff do not themselves invite all the users to the workshop. On the contrary, the invited users are asked to bring a friend. Thus, the museum staff have no control over who is invited. However, Emma assumes that they match certain criteria relating to those the museum staff have invited. She does not, like me, have the benefit of intense observation at as well as my sound recording of the workshop. She neither has

Julia: It wasn't exactly the cover girl segment [smiles]

Emma: There were two of those, but that was because we wanted it to be broader than we first discussed. (Meeting, 053012)

Obviously, the actions of the museum staff – defining a broader target group and inviting participants more or less in accordance with this definition to the user workshop – signals an inclination towards designing for a broader target group. I ask Emma about this position in my interview with her about the Moon Project:

Emma: Actually, we quite intentionally chose not to go only for the cover girls. The group we chose was quite intentionally more about feeling young or seeing themselves as young, and they should have an iPhone and be comfortable using that medium. And that could, for instance, be the cover girl segment, but had we chosen them alone, the solution would have become too narrow since our products have to appeal more broadly. Also, they're not our core target group, at least not at the moment.

Me: So the thing about appealing broadly and having a broad target group is important to you even though the digital designers tell you to choose one target group. There's some conflict in that, some difficulty in matching those things or...?

Emma: Yes, because if we had chosen the cover girl segment, we might have had 100 visitors in the exhibition, and perhaps two would have downloaded the app. And perhaps it would target them 100% but then we would have to be The Metropolitan or a museum with a much larger target group. (Interview, 081512)

Emma points to two positions. Firstly, the museum is obliged to appeal to everybody ('our products have to appeal more broadly') and secondly, the potential number of users is too small to target the solution narrowly, as would have been the case if the covergirl segment was the target group. There, however, also exists ambivalence in terms of these views. At the meeting on 053012, Maya brings up the target group subject:

Maya: I just think that we have to be a bit clearer in terms who we want the app to be for. I mean, do we want it to be enjoyable for everybody visiting the museum or do we want it to be fun to use for people who have an iPhone?

Maria: But that's obvious, because it only works on the iPhone.

Sarah: You can easily borrow one.

Maya: But if you want to appeal to everybody, then you need to be prepared to have museum personnel who can help all the 70-year-old ladies borrow an iPhone without knowing anything about how to push the buttons. So it's an overall discussion because I of course think it's good to appeal to everybody. But at the same time, I don't necessarily think it's a good idea in this case. (Meeting, 053012)

Maya 'of course' thinks it's good to appeal to everybody, deeming this viewpoint natural to have as a museum employee as herself, but at the same time suggests an 'overall discussion' of the issue because it might not be 'a good idea' when developing a mobile solution. The split between wanting to develop a narrowly targeted solution that also appeals broadly is indeed challenging for the participants. However, building on the findings from the user workshop, Julia shortly after presents a third option:

Julia: In relation to this, one of the groups was particularly passionate about the different interest points or knowledge needs – that these vary. And maybe you could appropriate that in different ways in a solution so that you can actually appeal to more target groups because you then have different ways to access the content. And more concretely, one of the groups talked about being interested in the details of the art piece; so that could perhaps be one way to engage with the art piece. While others could be interested in knowing more about the artist, and some would perhaps want a historical approach. So this might be a way to access the same art piece and provide different layers, and that would be possible to do if we classify target groups and work with personas; work with people, as if they have different knowledge needs. Can we appropriate that in different ways in an app? And then we are back at what Maya said about target groups – that we could perhaps appeal to different people in the same solution in that way because the content is differentiated. (Meeting, 053012)

I analyse this third option as a mid-seeking position in the negotiations on target group. Thus, appealing more broadly to different target groups in a digital solution is conceptualised as possible so long as the content is differentiated.

After having talked a bit about this interesting option, the participants continue onto an idea development session that I briefly touched upon in Chapter 4. They are divided into groups to develop ideas, which are later discussed in plenum. In these discussions, the issue of complexity is negotiated. For instance, Emma presents an idea for a solution containing two different functionalities that is instantly criticised for being too complex for the user:

Emma: You could also make 'dialogue' or 'game', or 'dialogue' or 'play', and then make the gameplay one option, or you could chose to see some experts in dialogue. So you choose whether you want to be entertained or whether you want to participate. That could also be a way to appeal more broadly since you could then choose between getting the audio guide and participating in a game.

Benjamin: But how do I know upfront if I'm one or the other? [the participants laugh]

Emma: Well, you have to choose one or the other thing. You enter one and see if you want to stay in that universe.

Julia: Then you would have to start with a quiz about your mood [the participants laugh]

Emil: We could make an app that you hold against the forehead- [the participants laugh and speak all at once]

Mark: But shouldn't we just choose one thing and then do that bloody well? (Meeting, 053012)

As in the Sun Project, complexity is argued to be problematic for the user because it creates confusion. Instead Mark (one of the Moon Exhibition people) proposes to 'choose one thing and then do that bloody well'. This comment should be seen in light of a general conceptualisation of the Sun App in the Moon Project as being too complex. I encounter this view in my interview with Emma about the Sun Project:

Me: What do you take with you to the next project?

Emma: I take a great deal of things with me, especially in relation to project development, like project planning and what's important in terms of that. And also complexity, how complex should it be? Because I actually experience the first one as having a lot of content and different options. You could perhaps make it simpler. (Interview, 052412)

Also, shortly after the user workshop in the Moon Project (051512), Julia sends out a message to the group, encouraging simplicity:

I would like to – with reference to the user workshop among other things – make a short statement before our meeting tomorrow – we have to think about making a super simple solution, and it should preferably be simpler and more delineated than the Sun App.

Emma replies to this message by stating: 'Simplicity sounds good'. Later in the project, Julia and Emma return to the issue during a telephone conversation:

> Julia: And I think that even though we tried to make the Sun App as simple as possible, it's really a bit complex actually with all those layers and back and forth and the map.

> Emma: Yes, it's very complex. (Telephone meeting, 060412b)

I dwell on the continual reference to the Sun App to highlight how it is increasingly conceptualised as being too complex. This tendency correlates in my interview with Emma about the Moon Project when she compares the Sun App with the Moon App:

> Emma: The other one [the Sun App] had more functions even though the ambition when we started was to make it completely simple. It actually turned out to be super complex. And this one [the Moon App] doesn't have as much content as the other one. (Interview, 081512)

From suggesting that 'you could perhaps make it simpler' and 'simpler and more delineated', the story about the Sun App ends up being that even though they tried to make it simple, it ended up being 'very complex' and 'super complex'. In this story, making a simple solution is idealised, but the ideal is difficult to reach, displaying ambiguity similar to that relating to designing for a narrow target group. Hence, designing a simple, narrowly targeted solution is perceived as good but difficult to achieve.

This position is also portrayed in the struggles of the museum staff to choose one idea in the Moon Project. As mentioned in section 4.1.4, the museum staff are keen on two ideas for the app. Julia and Benjamin ask them to meet internally and decide which direction to follow. However, the museum staff end up asking for a combination of the two ideas. In a telephone conversation between Emma and Julia, Julia problematises this decision, stating that the combination will confuse the user:

> Julia: In relation to what you said about wanting both versions, I think that we at least to some degree have to choose because it will be confusing for the user unless we can figure out a way to solve it more elegantly. But I'll talk to Benjamin and get back to you. (Telephone meeting, 060412b)

Benjamin agrees with Julia and during a Skype meeting between the Moon Project participants following the internal meeting, he states: 'We simply don't have time to develop both ideas' (Skype meeting, 060712). Julia later follows up and says: 'We definitely think that the idea will be strengthened if

it is simplified' (Skype meeting, 060712). In my interview with Julia and Benjamin about the Moon Project, they further explain their view to me:

> Benjamin: We can choose to develop both ideas in order to appeal to everybody, but with the budget we have, we will just end up doing both things half-heartedly because it's demanding; it's not something we can just do. And that's sort of similar to this, to the things about the two concepts. If you choose A and B, it will not end up as one strong concepts but two semi-strong concepts. (Interview, 090312)

At this point, reducing complexity is not just maintained as necessary for the sake of minimising confusion for the user, it is also viewed as compulsory due to time and budgetary conditions.

5.1.4. Positional map of the Moon Project

Moving on to the summary in the positional map, these positions against complexity are anchored in the top-left corner of the map together with the conceptualisation of the Sun App as being too complex and broadly targeted (Figure 21).

<table>
<thead>
<tr><th>Complexity/
broad target
group</th><th></th><th></th><th></th></tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Sun App was too complex and broadly targeted

Complexity is confusing for the user

We cannot develop both ideas because of time and budgetary conditions</td>
<td>Designing for everybody is good, but it is not necessarily a good idea for a mobile solution (ambiguity)</td>
<td>The museum is obliged by law to appeal to everybody

User workshop: Very diverse participants

User workshop: Redefinition of the target group to a broader conception</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Target group definition is only a tool, and the solution will probably appeal more broadly (elasticity)</td>
<td>User workshop: It is possible to appeal to different target groups in one solution if the content is differentiated</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Definition of a very specific target group: The covergirl segment

Sun App: It is extremely important to define a target group so the solution will be intuitive and easy to use

The idea will be strength-ened if it is simplified

We should do one thing and do that bloody well</td>
</tr>
<tr>
<td>Simplicity/
narrow target
group</td>
<td>The number of potential users is too small to target narrowly</td>
<td>Designing a simple solution for a narrow target group can be good, but it is also hypothetical and difficult, and the solution should be visible to everybody (inclusivity) (ambiguity)</td>
<td></td>
</tr>
</tbody>
</table>

- - -   Quality of the solution   + + +

Figure 21: Positional map of the Moon Project

In the Moon Project, complexity is still argued to be bad because it creates confusion for the user, and the Sun App is used in the negotiations as an example to prove the point. The application for funding is no longer part of the negotiations, but other structural conditions are mentioned, namely, the limited time and budget that make it impossible to develop a good complex solution.

In the bottom-left corner, we find a redevelopment of the position 'we don't know who will use the solution (anti-determinism)' to 'the number of potential users is too small to target narrowly'. Thus, the quality of the

solution will be bad for the majority if it is narrowly targeted since the potential number of targeted users would simply be too small.

Oppositely, in the bottom-right corner, choosing one way and one function is still seen as resulting in the best solution: 'we should do one thing and do that bloody well'. Also, it is suggested that simplicity strengthens the solution and, referring to the Sun App, defining a target group is argued to be extremely important in ensuring intuitivism and ease for the user, thus adding to the arguments in favour of a narrowly targeted solution.

Moving upwards, the top-right corner still holds the position 'the museum is obliged by law to appeal to everybody'. Two actions related to the user workshops further manifest this positioning, namely, the redefinition of the target group and the invitation of very diverse users. Thus, I analyse both of these actions as signalling an inclination towards a broadly targeted solution.

The ambiguity expressed in the Sun Project is increasingly evident in the Moon Project. The participants no longer use metaphors of danger but designing for a narrow target group is still seen as difficult and, now, hypothetical (relating to the anti-determinism expressed in 'we don't know who will use the solution' from the Sun Project). In addition, we see a preference for inclusivity over designing for a narrowly defined target group ('the solution should be visible for everybody'). Simplicity is also inferred in this ambiguity position in the sense that it is increasingly seen as a good thing, but at the same time, it turns out to be extremely difficult to actualise. In this way, the position inhabiting the bottom-middle section shows the ambiguity in deeming the quality of the solution to be good if it is simple and narrowly defined but, at the same time, viewing the approach as problematic (difficult, hypothetical and excluding).

Ambiguity is also manifested in the top-middle section of the map where designing for everybody is idealised but questioned in relation to the development of a mobile solution.

Finally, arguments positioned in the middle and middle-right sections have emerged. The middle position 'speaks' to some of the ambiguity and resistance in terms of defining a narrow target group by downplaying the actual role of target group definition. It is positioned in the middle since it is basically an argument for defining a narrow target group, but at the same time, the effect of doing so is defused in the name of uncertainty ('the solution will *probably* appeal more broadly').

Whether this results in a good or bad solution is irrelevant, contrary to the position in the middle-right section where it is argued that the solution can

be good even though it is positioned in between designing for a narrowly and broadly defined target group. Hence, what is idealised in this position is neither a narrow nor a broad target group but *different target groups* that can be accommodated in one solution as long as the content is differentiated.

5.1.5. Negotiations in the Stars Project

The Moon Project results in a mobile app which is launched in August 2012. Despite the goal of simplicity, two fairly different functionality ideas are manifested. When opening the app, the user can choose either to play a question game against fellow museum visitors or to complete a set of challenges concerning particular art pieces that the user must interact with – for instance, by taking and manipulating photos (in one case, resulting in what is conceptualised as augmented reality). Again, there is a social media layer incorporated in the solution, and the user can win prizes.

The duality manifested in the Moon App becomes a main point of discussion in the Stars Project. Shortly after the app is launched, Emma and Maya conduct a test of the app with the museum staff hosting guided tours in the Moon Exhibition. Besides many positive comments, the app is critiqued for being 'difficult to navigate in' and 'confusing in terms of functionality in general' (082012). Also of relevance for the analytical focal point, the guides simultaneously praise the app for being 'useful for different age groups' and criticise it for being 'a bit excluding' (082012).

A month later, this ambiguity is further showcased at the first meet-up in the Stars Project. The meet-up is conceptualised as a museum staff workshop and a range of people from different departments are invited (from the education, curation, communication, reception and guard departments). The goal of the workshop is to evaluate the Moon App and to get inputs for the Stars App. In the minutes from the workshop, Julia nicely sums up the ambivalence displayed in the discussions at the workshop (091912):

> In general, the participants agree that the app is including in terms of children and families with children. It is frequently used in educational practices and it therefore sustains the museum's own use of the app for this target group. At the same time, the app is criticised for not appealing to all target groups. An app/communication solution cannot appeal to all target groups because different target groups have different needs. This underlines the necessity to make explicit choices about target groups in order to set the success criteria. In relation to this, it is important to stress that the primary target group of the app was defined as the covergirl segment, meaning young women with iPhones who have an interest in fashion. Even though children

were not the target group, it's a success that children have taken up the app and use it together with their parents and grand parents.

The app is simultaneously praised for its inclusivity ('children and families with children' and 'educational practices') and critiqued for its exclusivity ('not appealing to all target groups'). Julia counters this ambivalence by stating that it is simply not possible to appeal to all target groups. In the minutes, she continuously stresses 'the importance of delineating the concept and the target group', that it is 'important to dare to choose one thing and develop it really well', that 'it's important to make choices: What is the purpose of the app? What is the content? Who is the target group?' and that there is a need for 'more focus on the purpose of the app, it's target group, user needs etc.'. She also points to the elasticity of the solution, deeming it a 'success' that children use the app even though they were not targeted.

A couple of weeks later, she further explores this point at an idea development meeting with a more selective group of museum staff who have all been involved in one or more of the previous projects (Emma, Maria, Mia, Emil and Maya). When the participants talk about the evaluation at the museum staff workshop, Julia says:

> Julia: There's always elasticity in terms of who you want to appeal to; this cannot be said often enough. And it's actually quite funny that children were pointed out because they weren't the segment or target group that was chosen to begin with. That's a good indicator of the elasticity. (Meeting, 100312a)

Her point about elasticity set forth in the Moon Project is strengthened by the exemplification of the Moon App, making it an even more useful argument in the Stars Project.

Before we dwell further on the negotiations at this meeting, we return to a conversation during the museum staff workshop which is of particular interest for the analytical focal point. At the end of the workshop, the participants discuss different external apps. For instance, Emil introduces a food app (called the Food App) to the group that he finds very appealing because it has a simple functionality:

> Emil: You're not mistaken about the function of the app when you download it. Before you enter your password on App Store, you know what you get. And it fulfils-

> Benjamin: -It is Caroline's cookbook [a Danish cookbook] with an expanded index, right?

Emil: Yes and it fulfils what it promises, which is also pretty important. Very simple. In a way, it is an answer to what my children wanted in the Moon App – some sort of encyclopaedia. Actually, that's why I thought of it.

Lisa: And maybe also the issue about differentiation. If you come to the museum as a child, then you might want to play or something like that. But maybe those who are 40 or 50+ don't think it's so cool to play a game. That might be the case.

Emil: But now I think we're getting away from what's really important about this Caroline's cookbook app, namely, that there is only one function. If you suddenly begin to say, well, we both have an encyclopaedia, and we have a game, then it starts getting muddy again. That's it – only one function that you can access in different ways. (Workshop, 091912)

Emil introduces the Food App to support his argument in favour of simplicity. When Lisa, a newcomer to the group (only invited to be part of the museum staff workshop), probably unintentionally redirects the focus, Emil interferes ('I think we're getting away from what's really important') and sticks to the topic by stating that more than one function in an app results in a confusing, 'muddy' experience. Benjamin picks up on this and refers to the problems occurring in the Moon Project:

Benjamin: Well, I kind of think this was also evident in the Moon Project. We started discussing whether we should go with one or the other idea and we couldn't make a decision so we chose to include both ideas. But now it's pretty clear that this makes the app a little confusing for many users. Had we only chosen one idea, it would have been much clearer.

Sandra: I guess we also did that in relation to not deciding on whether or not it should be art piece specific. And that also resulted in a mix that actually worked out; I think it has worked out very well, but we could have been stricter from the start. I just think you get a better product if you do that.

Emma: But some of what we talked about which characterised our museum – or our communication – in comparison with other places was that we, at least in the education department, do not necessarily think in terms of sender-receiver communication. It should be more unpretentious and playful, and if we become very functional, we lose that dimension. Or that could happen because the focus then would be on what the need is and how we can fulfil that without the surprise element that is also a part of our identity. We should at least be aware of that. (Workshop, 091912)

Emma presents a conflicting viewpoint. Thus, she conceptualises the 'one-functionality-approach' as anchored in a deterministic and functionalistic marketing logic of sender-receiver communication which leaves no room for unpretentiousness, playfulness and surprise that they have agreed in an

earlier discussion at the museum staff workshop are important characteristics of the museum identity. To this argument, Emil linguistically introduces an everyday artifact to the discussion, namely, a kitchen machine, which he uses to specify his point:

Emil: Yes, but we can work in accordance with different approaches. For instance, an approach could be that there should only be one function, and that function should be clear when you download. Then the function could be a game. Period. And a very clear-cut game. Or some other function. My opinion is that... if you, for instance, compare an app with a kitchen machine, right? If you can afford it, you buy a blender, a mixer, a mincer and a toaster and all those kinds of things. If you can't afford it, you go to the TV shop and buy some silly, idiotic machine that can do everything but that you end up throwing into a closet; that's just a piece of discount crap. The really exclusive machine is the one that only does one thing, the one that can brew a good cup of coffee, and then you have the bean grinder next to it. But the machine that wants to do everything at the same time is in a way sending a discount signal.

Emma: Yes. It was just a comment. (Workshop, 091912)

Clearly, the kitchen machine metaphor is useful in strengthening Emil's position. Furthermore, Benjamin backs him up again:

Benjamin: I very much agree with doing only one thing really really well and then only doing that one thing. The difficulty lies in figuring out what that one thing should be. Conceptually, you can say that it's easier to make an app that can do everything because then you don't have to make the difficult decisions; then you just include everything. The difficulty is to identify what the one thing should be.

Julia: But that is also, if I can comment on that, that is what we often experience when we develop an app. Then it suddenly has to solve all the communication needs that could possibly be at a museum. And it can't do that. Nor can it, well, it is also indicative of the target group and contents. It is simply absolutely necessary that we make some decisions about what we want, who the target group is and how we communicate to that target group. That might be the most important thing.

Benjamin: And you don't know, you have no idea about how surprising it actually is for us to hear someone working at an art museum say the things that Emil says. It's really rare [the participants laugh]. And many of you are even nodding. It's actually quite unique.

Julia: And we've got it on tape [she points at my sound recorder, and the participants laugh].

Maya: But still, that was exactly what we tried to do with the Moon App. In the beginning, it was really basic, but then a lot more was put into it when we first got started. It's enormously difficult.

Benjamin: Well, it's bloody difficult.

Emma: But it's much simpler than the Sun App [The participants laugh and those who have been involved in the Sun Project nod]. (Workshop, 091912)

The participants laugh at Benjamin's and Julia's comments about the rarity and uniqueness of encountering arguments in favour of simplicity within museums. Certainly, the participants seem to agree that simplicity is worth fighting for, but as Maya says, it is really not that simple. Maya is speaking in line with the ambiguity position when she points to the difficulty of designing a simple solution. In both the Sun Project and the Moon Project, the goal was simplicity, yet none of them succeeded in this regard. Indeed, it is 'bloody difficult' as Benjamin further adds, but at least the Moon App is 'much simpler than the Sun App', as Emma states. However, like the Sun App, the Moon App is described as too complex and broadly targeted, and throughout the Stars Project, the difficulty in designing a simple and narrowly targeted solution is identified as the reason.

At the meeting following the museum staff workshop, Emil even suggests that the difficult decisions should perhaps be pushed upwards in the system:

Emil: I'm thinking that it's a strategic decision – who the app should appeal to. And that might be a decision that should be made in a strategic context, and then the app can be developed so it best suits those who it should appeal to. And therefore, it's a decision that should be taken on a strategic level, not necessarily in this group. [...]

Julia: Do others also make decisions; or who is part of this group?

Emma: No, the ones who are part of this group are the ones with the most interest in it. And whatever we decide, management will support it. And the front staff want to know what they are to tell the visitors, and they of course also want to give us feedback about what they experience as missing and as working well, but I don't think that they want to take part in defining the target group. So this forum is the best one to decide on it because we're the ones who mostly have an opinion about it; and then we can get it confirmed before we finally decide.

Benjamin: Actually, you [to Emma] have taken the first step in relation to choosing a target group due to who you have invited later today. (Meeting, 100312a)

According to Emma, the difficult decisions are to be made in the group. However, as Benjamin says, Emma herself has already 'taken the first step' because she has invited users to participate in a user workshop later in the day. Emma explains that she has had a talk with Maria about whom to invite and that they have together decided to again ask some of the participants from the previous workshops as well as some newcomers with no prior relation to the museum. At the meeting and in later interviews, these participants are conceptualised as 'cultural consumers' and turn out to be a rather diverse group. As in the previous projects, the variety of users participating in the user workshop points to the ideal of a broad appeal. This ideal is also disclosed at the museum staff workshop (091912) when the participants discuss the target group of the museum in general. They talk about the variety of segments inhabiting the surrounding country and agree on what Julia, in her minutes, formulates as: 'The museum has a demographic commitment to interact with the neighbourhood'.

To return to the meeting following the museum staff workshop, the participants further explore the 'kitchen machine' issue. When discussing the need for simplicity, Emil again introduces an everyday artifact – a Swiss knife – but this time, Emma responds in the same manner:

> Benjamin: Our experience is definitely that if you include everything, you can't see any of it.
>
> Emma: No.
>
> Emil: It's just like a Swiss knife; you can't really use anything of what's in it. There's bloody no one who has ever cut out Christmas hearts with scissors from one of those. The only thing I use is the corkscrew.
>
> Emma: Well, I am actually very happy with my Leatherman. It's my only tool, and I can use it for everything [laughs]. So, it also has something to do with who you are.
>
> Mia: In that way, you just have different needs.
>
> Emil: Yes, that's right.
>
> Emma: I also like my phone; I'm so glad that it's not just a phone – that it can do all sorts of things.
>
> Emil: Of course, but the quality of the knife, the quality of the scissors and the quality of the nail cutter and the quality of all those things in such a Swiss knife is quite terrible.
>
> Emma: Yes, all right.

Mia: But also confusing.

Emil: You feel it all the time.

Mia: There is no transparency in such a Swiss knife.

Emil: No, you pull out and almost get your fingers clamped.

Mia: You don't know what's what-

[The participants all speak at once, excitedly]

Mia: If it was more transparent, I think it could contain more – if the structure is transparent.

Emma: So, it's also because you as a connoisseur know that you want the right screwdriver. You want to go in depth. So it also has a lot to do with target groups. Are you a first time visitor who needs a multi tool, or are you someone who wants to engage deeply with the artwork?

Maya: But then we should also consider who we're addressing. Should it be some kind of advertisement where you can see what you can do at the museum / or should it be ... /

Emma: / This is what happens today /

Maya: Or should it be for a connoisseur who would like to-

Maria: Well, then we're back at the target group. (Meeting, 100312a)

In this discussion, the two issues regarding complexity vs. simplicity and a broad vs. a narrow target group are completely intertwined. By referring to personal experiences in relation to common artifacts such as a Swiss knife, a Leatherman and a phone, the participants bring awareness to the different needs of different people. For some people ('connoisseurs'), multi-functionality signals discount. For others ('first time visitors'), multi-functionality is good and helpful.

As we see here, the issue about complexity vs. simplicity is very much rooted in discussions about mono- vs. multi-functionality in this project. In that sense, the participants explore the matter more concretely than in the Sun Project and the Moon Project where the discussions are more abstract (simple/complex). In these more concrete discussions, structure is noted to be an important element, as Mia points out in the above citation. Her mid-seeking argument about the possibility of containing more if the structure is transparent is related to 'the third option' discussed in the Moon Project ('It

is possible to appeal to different target groups in one solution if the content is differentiated'). Hence, the structure of the solution is designated as significant in terms of whether a solution like that is seen as good or bad (confusing).

Julia and Benjamin also operate in accordance with the mid-seeking position when they suggest the development of a stationary iPad solution instead of a mobile solution at the next meeting between the participants (112212). Based on the inputs from the museum staff workshop, the idea development meeting with the selected museum group and the user workshop, they present two ideas at the meeting. Both ideas are stationary iPad solutions, but one of them is broader in terms of appeal than the other. As Julie says in presenting the solution:

> Julia: It's a way to try to avoid having to talk about a specific target group; maybe we could actually address different visitor combinations in this solution. So if a family with children visits, they would actually get a meaningful experience with their children in relation to having a dialogue about the art piece. But you could also, if you wanted more thorough information or if you wanted it to be dialogue-based... So that might be a way to hedge ones horses without causing confusion. (Meeting, 112212)

When the participants discuss the two different solution ideas, this possibility of 'hedg[ing] one's horses without causing confusion' is clearly cherished. As Maria, for instance, says: 'I really like that we do not have to choose a target group. I think that's bloody difficult so that's a wonderful aspect of this solution' (Meeting, 112212). However, ambiguity is again an undercurrent in the discussions, concretely manifested on the blackboard in the meeting room where Julia writes the pros and cons of the two solution ideas. The broadly appealing solution is at the same time praised on the blackboard for having 'a flexible target group, different access points, differentiated content' and critiqued as: 'confusing as it wants to do different things (there is no concrete choice of one target group), differentiated content (huge complexity)'.

The two ideas are further discussed and developed into a new but related idea that is called 'a digital museum label' at the next meeting (010313). This digital museum label ends up being an app developed for stationary iPads installed in different places in the exhibition. Also, the app can be downloaded if the user wants to further explore the content after leaving the museum. The app consists of text, photo and video material, carefully structured to adhere to 'different visitor combinations', the expression Julia uses in the above citation.

Later in my interview with Julia and Benjamin about the Stars Project, they further explain the idea behind 'different visitor combinations' to me. In developing this kind of solution, they tell me that they prefer to conceptualise target groups in terms of 'different types of interaction with the art piece' instead of 'demographic' measures:

> Benjamin: We prefer to divide target groups in line with how they interact with the solution or the communication in front of them instead of where they're from.

> Julie: Yes, so by devising this structure we have tried to work in depth or in terms of different knowledge levels so it appeals more broadly since you can satisfy your specific knowledge interest. (Interview, 040813)

As portrayed in these statements, the solution format and the structure are essential for the success of a more broadly targeted and inclusive solution. In other words, in the Stars Project, it is deemed possible to appeal to different target groups (or 'visitor combinations') and include different functions without causing confusion if the right solution format is chosen (stationary iPad solution) and the structure of the content is transparent.

In my interview with Emma, she describes this solution as innovative because 'we dare to cut to the bone and do something enormously simple that is yet complex underneath' (Interview, 091613). Again, we hear about the 'danger' that we encountered in the first project, the Sun Project. Now, however, this danger has been overcome ('we dare') and throughout the Stars Project daring and not the danger as such is in focus, for instance, Julia says: 'you have dared to make some decisions' (Meeting, 100312a), and according to Emma, they have dared to 'be in a process and dared to let the results be formed by it. And that might not be so common in the museum world, not to have control over what's happening' (Interview, 091613).

Before I end my concluding interview with her, I ask her about the purpose of the Stars App:

> Me: So if you were to tell me the purpose of the app in one sentence, what would you say?

> Emma: To communicate the museum collection. And that was what we applied for money to do [...]

> Me: But maybe you could say that – you said that it actually fulfils the purpose for which you applied for money – it fulfils the purpose but perhaps with another technology from what you expected?

> Emma: Yes, it fulfils the purpose, but the way to get there turned out to be different from what we expected. (Interview, 091613)

Earlier in the interview, she further reveals:

> Emma: In the beginning, it was all about the technological possibilities, and when we found out that people perhaps don't care about that, it became more and more about identifying the target group we want to appeal to and which needs are not fulfilled by other communicational approaches at the museum. (Interview, 091613)

Emma thus gives a nice summary of the process showcased in this chapter. In line with the conclusions from the first part of the analysis, Chapter 4, technology becomes secondary, dynamic and flexible, benefitting the solution being developed: it thus 'fulfils the purpose, but the way to get there turned out to be different from what we expected', as Emma says.

I will certainly dwell more on this issue, but first, we have yet to sum up the positions taken in the Stars Project.

5.1.6. Positional map of the Stars Project

In the positional map of the Stars Project in Figure 22, we see many of the discussions from the previous projects being further explored.

Complexity / broad target group			
	The Moon App was too complex and broadly targeted		The museum has a demographic commitment to appeal broadly
	Moon App: Complexity is confusing for the user		User workshop: Very diverse participants
	The kitchen machine and the Swiss knife: Multi-functionality signals discount for some users		The Leatherman and the phone: Multi-functionality is good for some users
		Target group definition is only a tool and the solution will probably appeal more broadly as the Moon App does (elasticity)	It is possible to appeal to different target groups and include different functions without causing confusion if another solution format is chosen (stationary iPad solution) and the structure of the content is transparent (the Swiss knife)
			Food App: The solution should only have one simple function
Simplicity / narrow target group	The 'one-function-approach' is anchored in a deterministic, functionalistic marketing logic with no room for unpretentiousness, playfulness and surprise	Sun and Moon app: Designing a simple solution for a narrow target group can be good, but it is also bloody difficult and courage demanding (ambivalence)	Moon App: It is simply absolutely necessary to make choices about target group and content even though it is bloody difficult
- - -		Quality of the solution	+ + +

Figure 22: Positional map of the Stars Project

In the top-left corner, two formulations from the Moon Project are still pertinent ('the Moon App was too complex and broadly targeted' and 'complexity is confusing for the user'), but in this project, the positions are even more related to concrete artifacts as exemplifiers. The discussions about mono- vs. multi-functionality are likewise more concrete, and in the top-left corner, they are anchored in the position presented via the kitchen machine and Swiss knife, namely, that multi-functionality is bad because it signals discount.

This position is contrasted with that presented via the Leatherman and the phone argument in the top-right corner, maintaining that multi-functionality can be good for some users. In addition, a broad and complex solution is cherished since the museum has a demographic commitment to appeal broadly, an ideal exemplified in the user workshop where a very diverse set of participants are invited to give inputs.

Also, in the bottom-left corner, the 'one-function-approach' is faulted for resulting in bad solutions because it is anchored in a deterministic, functionalistic marketing logic with no room for essential characteristics of the museum's identity – that is, the ability to be unpretentious, playful and surprising.

Moving to the bottom-right and, indeed, opposing corner, the need for simplicity and narrow targeting is stressed even more in the Stars Project: choosing one function and one target group is 'absolutely necessary'. At the same time, however, the difficulty of doing so is now also acknowledged in this corner. The ambiguity in wanting to design a simple solution for a narrow target group while finding it difficult and courage demanding is thus further recognised and 'spoken to' in this project (bottom-middle section).

Again, the elasticity argument ('target group definition is only a tool, and the solution will probably appeal more broadly') takes a middle position in the negotiations, but this time, it is further strengthened since the Moon App has proven the point.

One step to the right, we find the further exploration of the mid-seeking position presented in the Moon Project. Now, a solution appealing to different target groups and including different functions is conceptualised as good (not confusing) if another solution format is chosen (stationary iPad solution) and the structure of the content is transparent.

5.2. INTERPRETATIONS OF THE POSITIONAL MAPS

5.2.1. Comparison with studies of exhibition negotiation and co-design

In the literature and theory chapter, I introduced conclusions from studies focusing on internal exhibition negotiation and co-design across boundaries. In the current section, I interpret the positional maps in relation to these studies, particularly the three different lenses for exploring heterogeneity in the negotiation and co-design of exhibitions (see section 2.2.4).

If we consider the museum values framework by Davies, Paton & O'Sullivan (2013), the right half is of particular relevance to the negotiations highlighted in the Art Case (Figure 4).
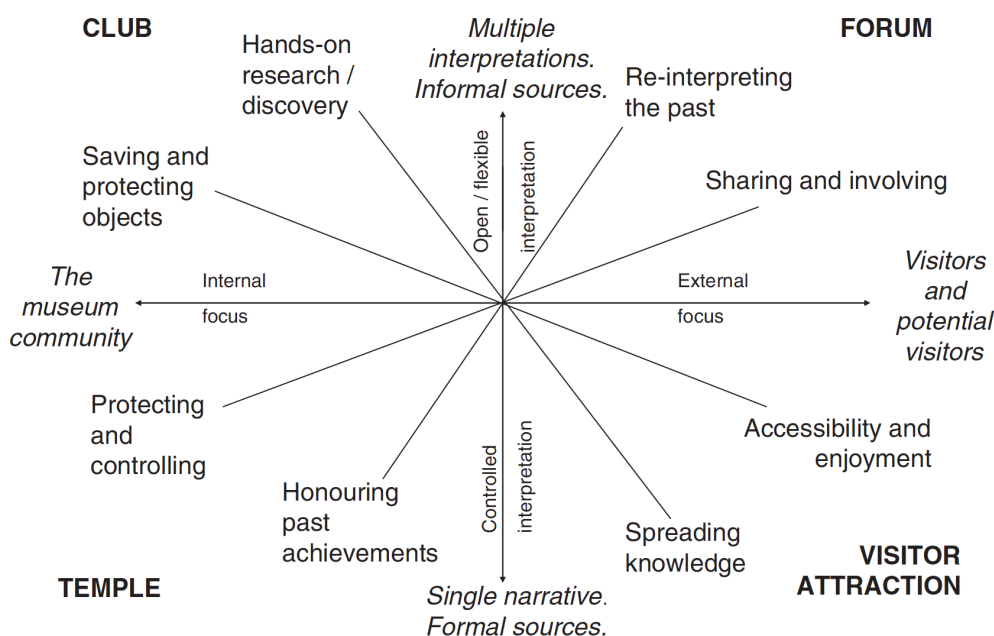
Figure 4: The Museum Values Framework (Davies, Paton & O'Sullivan 2013) (introduced in section 2.2.4)

The Art Case positions on complexity/broad target group vs. simplicity/narrow target group are primarily externally focused, thus manifesting ideals of the museum as a forum and a visitor attraction. In *the forum mode* (top-right corner in the museum values framework), the museum is praised as an inclusive, experimental forum for reflection and participation; everyone is invited to join and the interpretation performed by a visitor is as valid as the one performed by a curator. We see such forum-mode viewpoints positioned in the bottom-left and top-right corners of the positional maps of the negotiations in the Art Case, manifested in the desire to appeal to everybody and the increasingly elaborated criticism of the simple, one-function, narrowly targeted approach for being anchored in a deterministic, functionalistic marketing logic with no room for unpretentiousness, playfulness and surprise.

In terms of curriculum theories, the ideals of complexity and a broad appeal are related to constructivist/problem-solving as well as laissez-faire (salad bar) exhibition approaches (Lindauer, 2005). Thus, in these positions, we spot the prioritisation of constructivism and multiple options, for instance,

exemplified by the Leatherman/phone argument in the Stars Project, conceptualising the multi-tool as the optimal solution. Also, as Benjamin asserts in his description of the final solution (the Stars App), 'you actually decide yourself' how you want to 'interact' with this solution (Interview, 040813), thus revealing constructivist, self-managed and self-motivated learning ideals.

In contrast, the top-left and bottom-right positions on the positional maps of the Art Case correspond to a view of the museum as a *visitor attraction*. Here, visitors are also in focus, but the goal is to communicate effectively and satisfy 'the costumer' (Davies, Patona, & O'Sullivana, 2013). In the Art Case, the positions manifesting the visitor attraction mode are therefore in favour of reducing confusion and complexity in line with user needs that are either imagined due to previous experience or derived from the user workshops. The solution should thus be simple, easy to use and intuitive for the target group for which it has been designed. Throughout the process, these arguments are increasingly stressed – from stating that the best result comes from choosing 'one way and one function' in the Sun Project to deeming it 'absolutely necessary to make choices about target group and content even though it is bloody difficult'.

The curriculum theory prioritised in line with this is similar to what Lindauer (2005) designates as a narrative curriculum theory. Here, the good story is in focus, providing the visitor with a clear and meaningful way through the exhibition, not displaying a myriad of possible interpretations and approaches to the material. In the Art Case, the ideal is not one story but one function, and multi-functionality is strongly critiqued, for instance, by reference to the discount-signalling kitchen machine and Swiss knife in the Stars Project. Instead, the ideal is to have separate instruments with one clear function, such as, a coffee machine, a bean grinder and a pair of scissors.

All of these positions and their significance clearly change throughout the processes and drag the negotiations in different directions. To some extent, they are manifested in differing social worlds or communities of practices, as indicated in other previous studies of collaborative museum design (Lee, 2004, 2007a, 2007b; Hansen & Moussouri, 2005; Moussouri, 2012). The forum mode arguments are highly related to museum discussions within the educational world, and as we saw in the social worlds/arenas maps in Chapter 4, the educational world is the world mostly represented in the processes (in all three projects, the world of education has the highest number of participants). At the same time, the visitor attraction mode arguments can easily be tracked to the digital designers, especially in the

beginning of the cases. Not surprisingly, since they represent a design company and they therefore are used to operate within a commercial logic.

However, this characterisation is too simplistic as is strongly illustrated in the manner in which participants act in accordance with different sometimes contrasting positions during the process. For instance, Emma begins the Moon Project by saying 'we have experienced that a very specific target group has to be chosen' (Meeting, 050212). However, later in the project she says that 'we wanted it to be broader than we first discussed' (Meeting, 053012) and argues that if the target group was only the cover girl segment 'the solution would become to narrow since our products have to appeal more broadly' (Interview, 081512). Likewise, in the Sun Project, Julia says 'you can't appeal to everybody in a digital solution; you have to choose' (Interview, 052112), thus contrasting her presentation of the Stars App concept: 'It's a way to try to avoid having to talk about a specific target group; maybe we could actually address different visitor combinations in this solution' (Meeting, 112212). Hence, people, positions and their interrelations change due to shifting contexts and the passing of time, thus sustaining the rationale for choosing positions as the analytical focus rather than people and functional units per se.

To sum up, the analysis supports conclusions presented in the literature and theory chapter from studies of collaborative exhibition design processes which display such processes as messy affairs, full of a diversity of positions, values, curriculum theory ideals, communities of practice and the like shaping the process and the products (see section 2.2.4). Thus, in the Danish context of developing digital museum communication, we see some of the same opposing viewpoints as in the American and English contexts of exhibition making. Most pertinently in the Art Case, there is opposition between the ideals of the forum mode and a laissez-faire, constructivist/problem-solving curriculum theory and ideals of the visitor attraction mode and a narrative curriculum theory.

Similar to these other studies, I wish to shed light on the emergent and heterogenic character of collaborative museum design processes and the need for treating consequential conflicts as natural and constructive instead of destructive. In addition, I seek not only to support these stances about collaborative museum design but also to further unravel what happens at the *boundaries* of heterogeneity and how digital museum communication emerges in its midst. In the Art Case, I interpret two – what can be characterised as – boundary phenomena as having particular value in relation to positional emergence and artifactual emergence, namely, ambiguity and reification. As illustrated in Figure 23, these boundary phenomena are manifested in the positional maps as two middle axes.

Complexity/
broad target
group

Axis of ambiguity

Axis of reification

Simplicity/
narrow target
group

Quality of the solution

- - -   + + +

Figure 23: Axis overview

In the following two sections, I will explore these two axes in relation to two theoretical frameworks that I find particularly useful for interpreting heterogeneity and emergence. The first is primarily of a linguistic and discursive affiliation, composed of Bakhtin's notions of ambiguity and centripetal/centrifugal forces that I will use to interpret positional emergence. The second adds materiality to the interpretation to investigate artifactual emergence more carefully by using the theory of boundary objects and boundary negotiating artifacts.

5.2.2. Interpretation of the positional emergence: The vertical axis of ambiguity

> The person who understands must not reject the possibility of changing or even abandoning his already prepared viewpoints and positions. In the act of understanding, a struggle occurs that results in mutual change and enrichment. (Bakhtin, 1986, p. 142)

Before I interpret the positional emergence, I want to start with a characterisation of what I call the vertical axis of ambiguity. Positions are present on this axis throughout the Art Case. Scrutinising these positions, it appears that two different kinds of ambiguity positions exist:

1) Positions that indirectly reveal ambiguity

2) Positions that refer directly to ambiguity and conceptualise it as natural

The first kind of ambiguity position resides primarily in the bottom-middle section of the positional maps. Underlying the utterances and actions of the participants, we spot ambiguity between seeing simplicity and narrow targeting as good versus 'dangerous', difficult, hypothetical, exclusivist and courage demanding etc. The top-middle position in the Moon Project also fits this formula but in an opposite fashion ('designing for everybody is good, but it is not necessarily a good idea in a mobile solution').

The second kind of ambiguity positions 'speaks to' the first kind, adding a meta-interpretational layer. In the map of the Sun Project, the top-middle position in the map represents precisely such a position, bridging the surrounding positions on the issue of complexity vs. simplicity ('even if we choose one overall approach, it will be complex (whether that is good or bad)'). This kind of direct reference to and naturalisation of ambiguity is related to target group elasticity in the Moon Project and the Stars Project, bridging even further, signified by the positioning of the viewpoint in the very centre of the map ('target group definition is only a tool, and the solution will probably appeal more broadly (elasticity)'). Julia is the one introducing this position as well as the middle-right position ('the third option'), corresponding with my categorisation of her as a broker (see section 3.1.3).

Let us now take a look at the positional emergence and the corresponding importance of ambiguity. To do so, the struggle between centripetal and centrifugal forces comes into play (Bakhtin, 1981). A quick reminder before we proceed: centripetal forces strive for unification and centralisation while centrifugal forces continually decentralise and de-unify. Centrifugality is

given and manifests the realities of heteroglossia of unfinalisable flux while centripetality is 'felt' and posited as a force for overcoming this complexity. Following poststructuralist readings of Bakhtin, we can look for centripetal forces as centralising, dominating positions and centrifugal forces as decentralising, marginal positions. Clearly, many positions are expressed and interact throughout the Art Case. However, it is interesting to see how centripetality is perceived and posited in relation to the three projects and how the centrifugal forces push the centripetality, particularly because of the axis of ambiguity.

In the Moon Project, the participants very much conceptualise the Sun App as dominated by the top-right and bottom-left positions on the positional map. As we have already heard, the perceived structural conditions of the application for funding and the obligations to appeal to everybody (top-right corner) as well as the anti-determinism and salad bar ideals of the forum mode (bottom-left corner) are largely posited as dominating positions in the Sun Project. This results in a solution that is 'too complex and broadly targeted', as we hear in the Moon Project. In the Sun Project, the perceived centripetality can thus be visualised by the dotted axis inserted on the positional map in Figure 24.
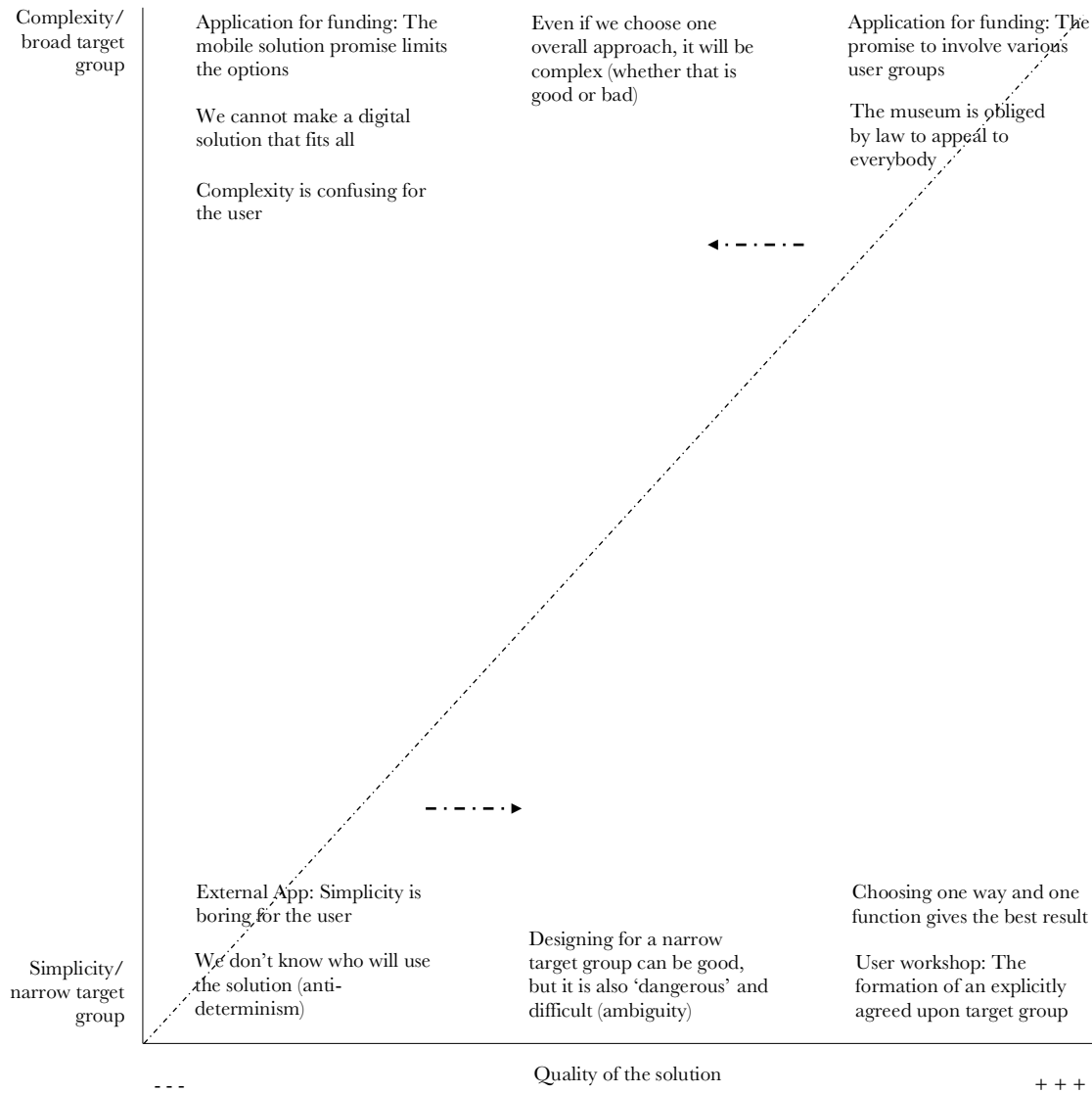
Figure 24: Positional emergence: The Sun Project

The other positions are centrifugal and thus more marginal in terms of influencing the product. But these centrifugal positions are not without force, and the centripetality is drawn towards them, as visualised in Figure 24 by the two arrows. Since there are yet no positions on the horizontal axis, a counter-clockwise turn towards the vertical is natural. Also, this movement is possible because the positions are not completely polarised. Already in the Sun Project, ambiguity is present and opens up for negotiations on the boundaries between the outer poles.

Indeed, this vertical axis of ambiguity is very much explored in the Moon Project, housing three positions. Not surprisingly, the participants in the Stars Project conceptualise the axis of ambiguity as dominating in terms of

194

the resulting Moon App. Hence, in the beginning of the Stars Project, the participants agree that making a simple, narrowly targeted solution was the intention in the Moon Project. This intention, however, was not actualized because it turned out to be 'bloody difficult'. Thus, the difficulty is staged as the dominant scapegoat, and the perceived centripetality correlates with the vertical axis of ambiguity as illustrated in the positional map of the Moon Project in Figure 25.

Complexity/ broad target group

The Sun App was too complex and broadly targeted

Complexity is confusing for the user

We cannot develop both ideas because of time and budgetary conditions

Designing for everybody is good, but it is not necessarily a good idea for a mobile solution (ambiguity)

The museum is obliged by law to appeal to everybody

User workshop: Very diverse participants

User workshop: Redefinition of the target group to a broader conception

Target group definition is only a tool, and the solution will probably appeal more broadly (elasticity)

User workshop: It is possible to appeal to different target groups in one solution if the content is differentiated

Definition of a very specific target group: The covergirl segment

Sun App: It is extremely important to define a target group so the solution will be intuitive and easy to use

The idea will be strength-ened if it is simplified

We should do one thing and do that bloody well

Designing a simple solution for a narrow target group can be good, but it is also hypothetical and difficult, and the solution should be visible to everybody (inclusivity) (ambiguity)

Simplicity/ narrow target group

The number of potential users is too small to target narrowly

- - -   Quality of the solution   + + +

Figure 25: Positional emergence: The Moon Project

Again, there is a pull towards some of the centrifugal positions. These centrifugal positions cluster particularly in the right half of the map and the

top-left corner, resulting in another counter-clockwise turn in the Stars Project map (Figure 26).

Complexity/ broad target group

The Moon App was too complex and broadly targeted

Moon App: Complexity is confusing for the user

The kitchen machine and the Swiss knife: Multi-functionality signals discount for some users

The museum has a demographic commitment to appeal broadly

User workshop: Very diverse participants

The Leatherman and the phone: Multi-functionality is good for some users

Target group definition is only a tool and the solution will probably appeal more broadly as the Moon App does (elasticity)

It is possible to appeal to different target groups and include different functions without causing confusion if another solution format is chosen (stationary iPad solution) and the structure of the content is transparent (the Swiss knife)

Food App: The solution should only have one simple function

Moon App: It is simply absolutely necessary to make choices about target group and content even though it is bloody difficult

The 'one-function-approach' is anchored in a deterministic, functionalistic marketing logic with no room for unpretentiousness, playfulness and surprise

Sun and Moon app: Designing a simple solution for a narrow target group can be good, but it is also bloody difficult and courage demanding (ambivalence)

Simplicity/ narrow target group

- - -

Quality of the solution

+ + +

Figure 26: Positional emergence: The Stars Project

In the Stars Project, the horizontal axis is significantly explored, and the middle-right position dominates to the extent that a new solution format is chosen (a stationary iPad solution instead of a mobile solution). The possibility of appealing to different target groups and include different functions is indeed conceptualised as the brave effort of the Stars App, as Emma says: 'we dare to cut to the bone and do something enormously simple that is yet complex underneath'. Like in the Moon Project, the centralisation is posited on a middle axis – this time the horizontal axis –

where the boundaries between the top-right and bottom-right positions are explored in order to come up with a good solution that bridges the opposing views.

To conclude, we see a counter-clockwise positional emergence evolving in the struggles between centripetal and centrifugal forces, as illustrated in Figure 27.
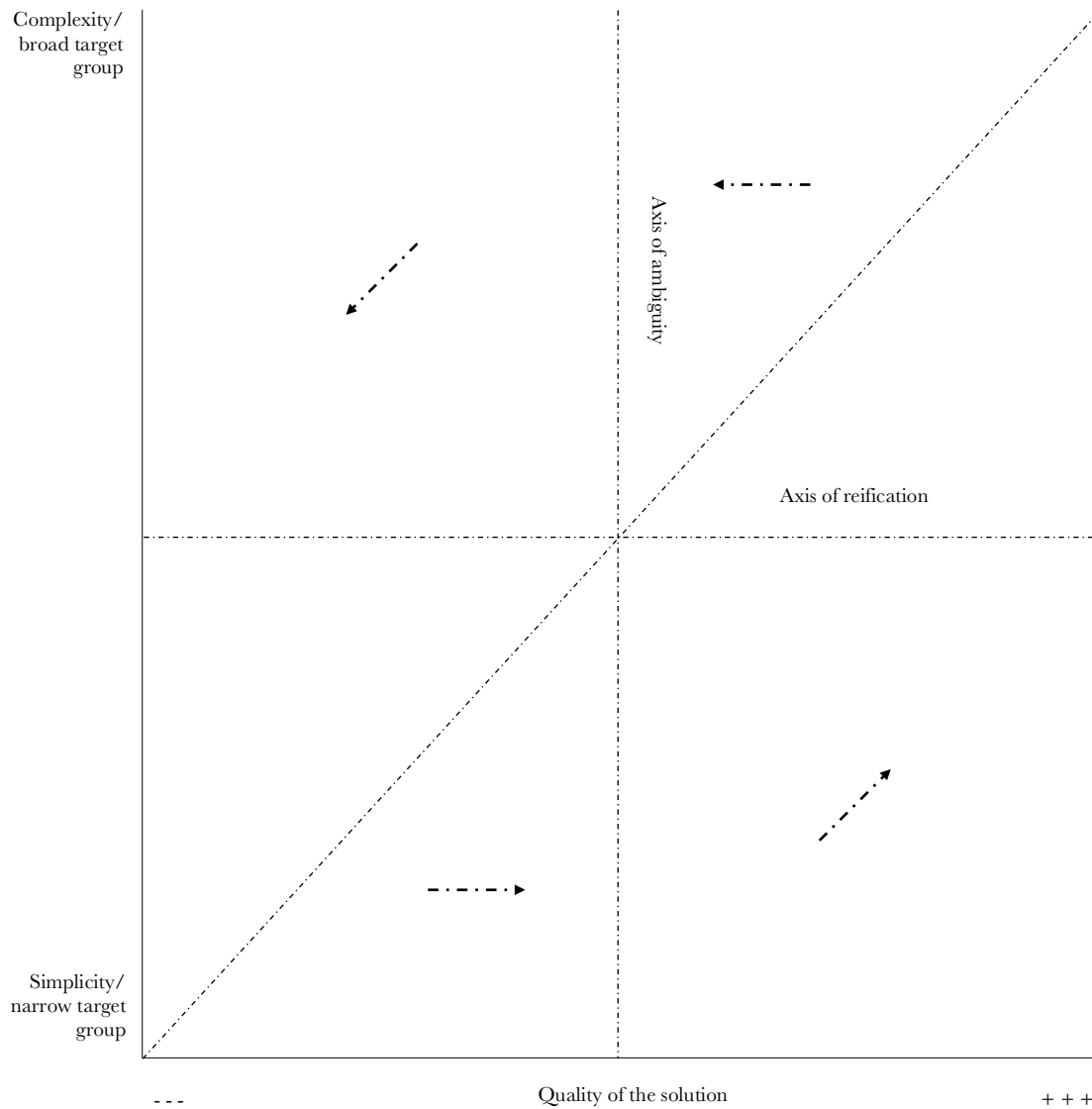
Figure 27: Overview of the positional emergence in the Art Case

The emergence visualised in the positional maps is of course an extreme simplification. To the human mind, I truly believe that the dynamics of

centripetal and centrifugal forces are incomprehensible. Yet, by analysing the positional maps in relation to these forces, positional emergence is revealed, shedding light on some of the process dynamics within.

As illustrated, ambiguity is important in opening up negotiations on the boundaries between polarised positions. Being aware of this ambiguity – working with it and speaking to it – is basically what opens up for and anchors positional emergence. In researching as well as practicing collaborative museum design, ambiguity should therefore be recognised as a potentially valuable boundary phenomenon that deserves careful exploration practically and theoretically to concretely enrich development projects and abstractly empower the theory about them.

Thus, the axis of ambiguity is indeed a step on the way towards deeper levels of co-design, here manifested in the other axis – the horizontal axis of reification – to which we now turn.

5.2.3. Interpretation of the artifactual emergence: The horizontal axis of reification

> The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds. (Star & Griesemer, 1989, p. 395)

> Theories are needed to explain how collaborators from different communities of practice, that lack pre-existing standards, use material artifacts to collaborate. (Lee, 2007a, p. 314)

Having dwelt mostly on discursive, linguistic elements in the interpretation so far, time has come to focus on materiality. I got aware of the possible significance of materiality when I started to more thoroughly interrogate the positions on the positional maps. I noticed that many of the positions were significantly shaped by or enacted in relation to three aspects, namely, artifacts, structural conditions and user workshops.

Artifacts are solutions developed by the group or other, external artifacts known by or introduced to the group (e.g. the Sun App, the Moon App, the Stars App, the External App and the Food App). *Structural conditions* are conditions perceived as more or less given by the participants due to the overall structure of the project (e.g. formulations in the application for funding, time and budgetary conditions) or broader societal structures (e.g. legal obligations). *User workshops* are events hosted to get inputs from potential users, resulting in certain actions performed or insights gained (e.g. redefinition of the target group and inviting diverse participants).

I continually tracked these affiliations in the positional maps. When highlighted, they showcase an interesting change occurring. First, take a look at the positional map of the Sun Project and notice the added letters in parentheses (Figure 28).
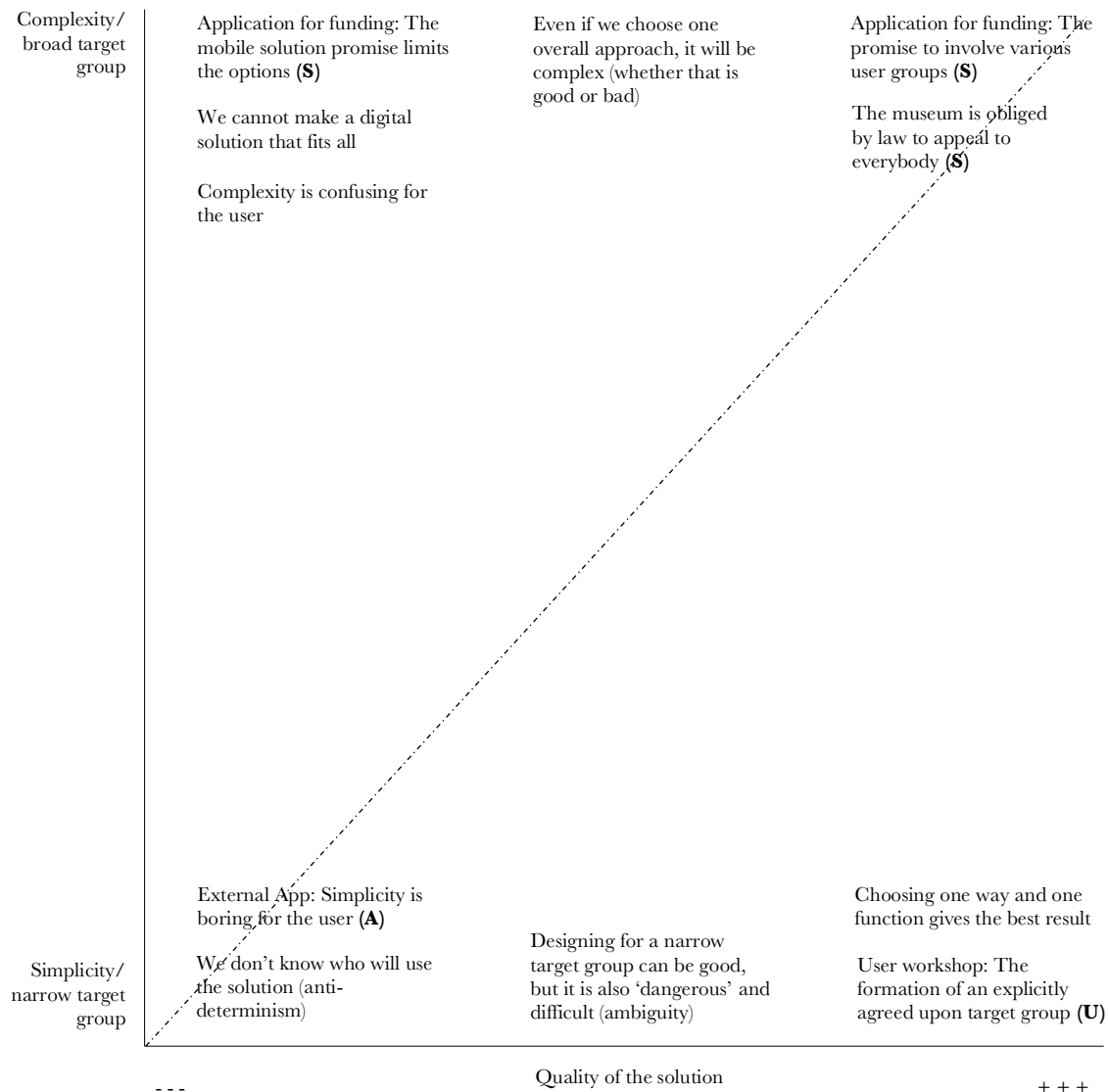
Figure 28: Artifactual emergence: The Sun Project (A = artifact, S = structural condition, U = user workshop)

In the Sun Project, the negotiations are mostly guided by perceived structural conditions (three 'S's) with the centripetality also revolving around this (two 'S's). This tendency has already been quite thoroughly examined in the first part of the analysis (Chapter 4) where I showed how the perceived structural conditions manifested in the application for funding constrained the co-design within the Sun Project.

In the Moon Project, the centripetality is anchored in discursive, linguistic explorations of ambiguity, and the perceived structural conditions seem to lose impact. Also, on the right third part of the map, the positions relate specifically to the user workshop (3 'U's), as visualised in Figure 29.

Complexity/ broad target group

The Sun App was too complex and broadly targeted (**A**)

Complexity is confusing for the user

We cannot develop both ideas because of time and budgetary conditions (**S**)

Designing for everybody is good, but it is not necessarily a good idea for a mobile solution (ambiguity)

The museum is obliged by law to appeal to everybody (**S**)

User workshop: Very diverse participants (**U**)

User workshop: Redefinition of the target group to a broader conception (**U**)

Target group definition is only a tool, and the solution will probably appeal more broadly (elasticity)

User workshop: It is possible to appeal to different target groups in one solution if the content is differentiated (**U**)

Definition of a very specific target group: The covergirl segment

Sun App: It is extremely important to define a target group so the solution will be intuitive and easy to use (**A**)

The idea will be strengthened if it is simplified

We should do one thing and do that bloody well

Designing a simple solution for a narrow target group can be good, but it is also hypothetical and difficult, and the solution should be visible to everybody (inclusivity) (ambiguity)

Simplicity/ narrow target group

The number of potential users is too small to target narrowly

Quality of the solution

- - -   + + +

Figure 29: Artifactual emergence: The Moon Project (A = artifact, S = structural condition, U = user workshop)

The positions are further and more concretely explored in the Stars Project where the negotiations as well as the centripetality are highly related to artifacts (9 'A's), as illustrated in Figure 30.

The following is a figure (Figure 30) showing a 2x3 matrix plot with a vertical axis labeled "Complexity/broad target group" (top) to "Simplicity/narrow target group" (bottom), and a horizontal axis "Quality of the solution" ranging from "- - -" to "+ + +".

Top-left quadrant:

The Moon App was too complex and broadly targeted (**A**)

Moon App: Complexity is confusing for the user (**A**)

The kitchen machine and the Swiss knife: Multi-functionality signals discount for some users (**A**)

Top-right quadrant:

The museum has a demographic commitment to appeal broadly (**S**)

User workshop: Very diverse participants (**U**)

The Leatherman and the phone: Multi-functionality is good for some users (**A**)

Middle-center:

Target group definition is only a tool and the solution will probably appeal more broadly as the Moon App does (elasticity) (**A**)

Middle-right:

It is possible to appeal to different target groups and include different functions without causing confusion if another solution format is chosen (stationary iPad solution) and the structure of the content is transparent (the Swiss knife) (**A**)

Bottom-right:

Food App: The solution should only have one simple function (**A**)

Moon App: It is simply absolutely necessary to make choices about target group and content even though it is bloody difficult (**A**)

Bottom-left:

The 'one-function-approach' is anchored in a deterministic, functionalistic marketing logic with no room for unpretentiousness, playfulness and surprise

Bottom-center:

Sun and Moon app: Designing a simple solution for a narrow target group can be good, but it is also bloody difficult and courage demanding (ambivalence) (**A**)
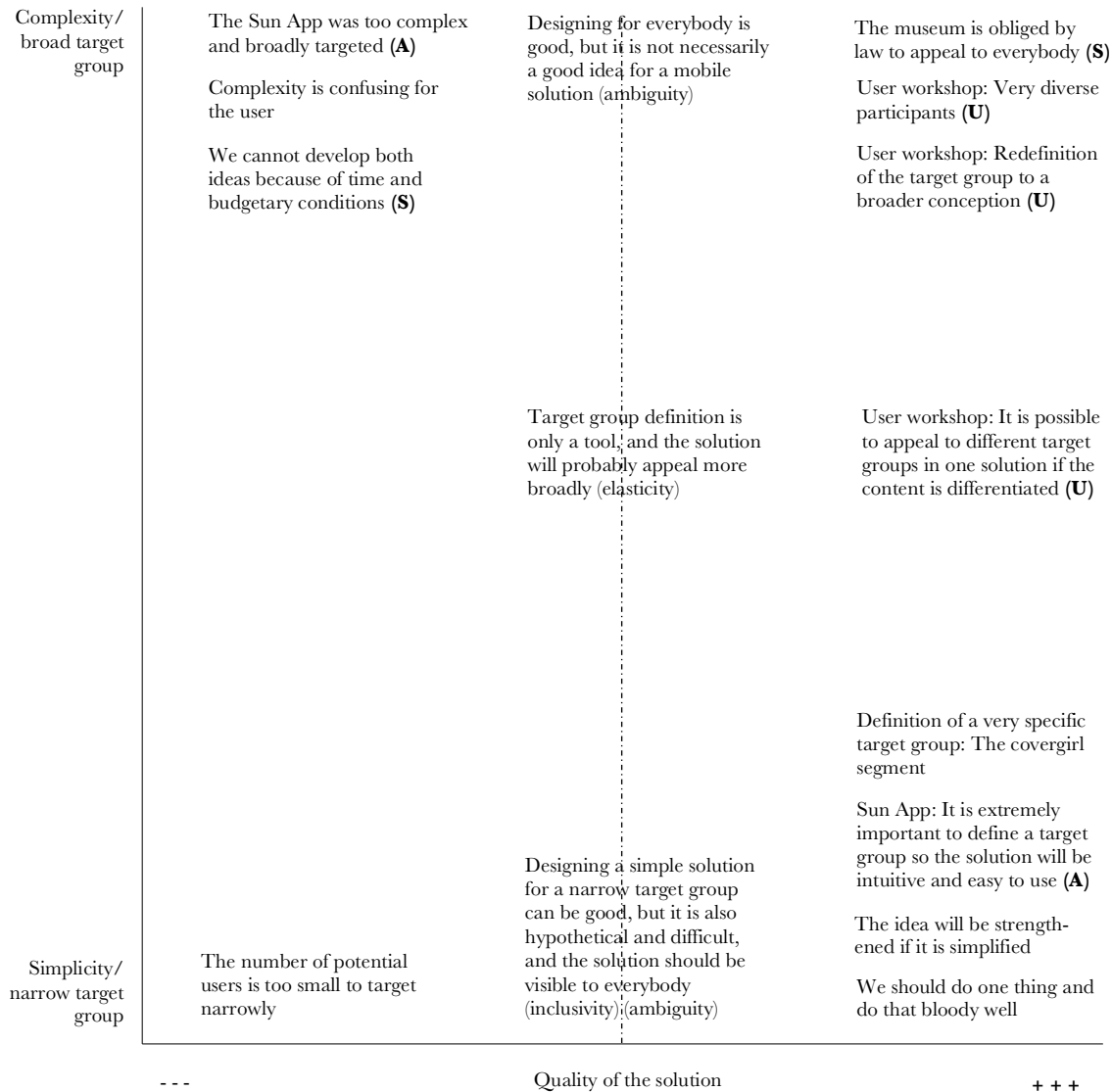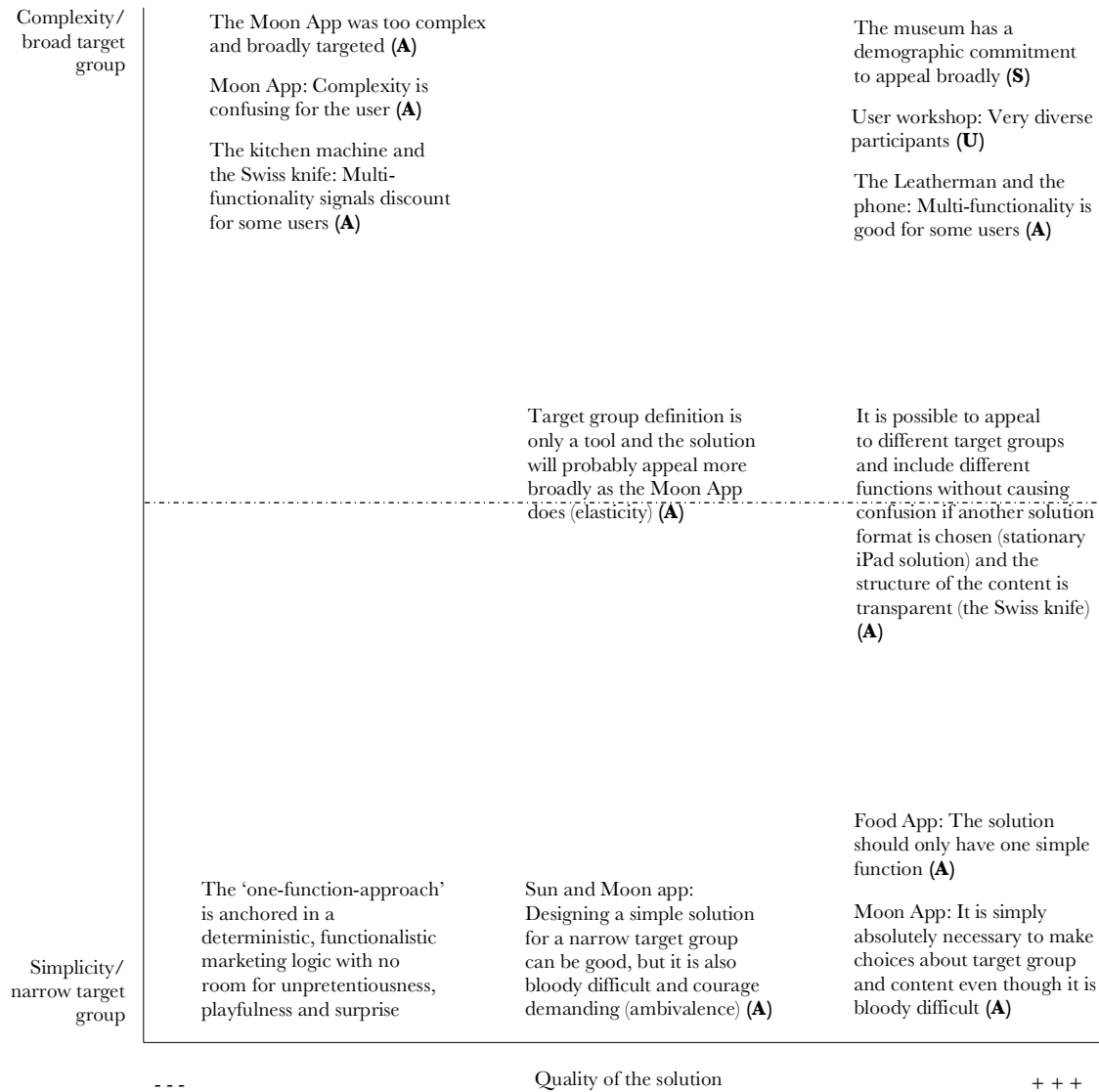
Figure 30: Artifactual emergence: The Stars Project (A = artifact, S = structural condition, U = user workshop)

Clearly, there is a noteworthy increase in the relation between artifacts and positions, but what is the significance of these artifacts in regards to boundary negotiation? To further understand this, we return to Lee's theory of boundary negotiating artifacts that expands on boundary object theory by conceptualising artifacts as not merely sailing across boundaries. On the contrary, artifacts can be used to push boundaries in terms of their ability to 'record, organize, explore and share ideas; introduce concepts and techniques; create alliances; create a venue for the exchange of information; augment brokering activities; and create shared understanding about specific design problems' (Lee, 2007a, p. 333).

As outlined in the literature and theory chapter, Lee (2004, 2007a) presents five types of boundary negotiating artifacts: self-explanation, inclusion, compilation, structuring, and borrowing. In the Sun Project, we only come across one artifact, namely, the External App mentioned in the discussions to exemplify that simplicity is boring. The digital designers have developed the app for another museum, and the Sun Project participants appear to know the app quite well. It has the purpose of an inclusion artifact though with opposite intent. The External App is not used to introduce a new idea, concept or form; rather, it is used to argue against an idea, namely, the idea of making a simple solution.

Throughout the Art Case, the artifacts either have inclusion or exclusion as underlying intents, serving to drag the negotiations back and forth across the boundaries between the different positions. In the Moon Project, the Sun App exemplify both inclusion ('Sun App: It is extremely important to define a target group so the solution will be intuitive and easy to use') and exclusion ('The Sun App was too complex and broadly targeted').

In the Stars Project, we come across a variety of examples in terms of using artifacts to argue for both exclusion (the positions in the top left corner) and inclusion (the positions in the right third part) as well as doing both at the same time (the positions on the axis of ambiguity). Also, in the Stars Project, a borrowed artifact is present. Thus, the idea to introduce the kitchen machine and the Swiss knife – done by Emil to argue that 'multi-functionality signals discount for some users' (top-left corner) – are borrowed by Emma in the introduction of the Leatherman and the phone ('multi-functionality is good for some users', top right corner). These are also used in arguments for transparency (the middle-right position), deeming it possible to appeal to different target groups and include different functions in a solution.

I do not find it surprising that no compilation or structuring artifacts are present in the negotiations of the analytical focal point since compilation and structuring are more about construction than idea and concept development. Also, the analysis has been concerned with interaction and with artifacts used to serve interaction. Therefore, self-explanation artifacts (even though most likely present) are neither showcased on the positional maps.

In addition, there is a significant difference between the inclusion/exclusion and borrowed artifacts in the Art Case and those outlined by Lee: They are not present in a physical sense, only in a symbolic, linguistic sense. Even though they share intention in terms of inclusion/exclusion and borrowing, there is significant variation because the artifacts in the Art Case are not

reified positions that anchor arguments in physical form. Instead, they are *reifying* positions, concretising negotiations without actually having physical presence. What I am suggesting is a broad conceptualisation of artifacts and their function in relation to idea and concept development. To serve this suggestion, the concept of 'reification' is useful.

Etymologically, reification means 'making into a thing' (Wenger, 1998, p. 58), and it carries different connotations across academic disciplines. For instance, it can refer to both objectification, as in treating human beings as objects, and to materialisation and concretisation. I use the concept in the latter sense, similarly to educational theorist Étienne Charles Wenger that explains reification as:

> ...the process of giving form to our experience by producing objects that congeal this experience into 'thingness.' [...] Writing down a law, creating a procedure, or producing a tool is a similar process. A certain understanding is given form. This form then becomes a focus for the negotiation of meaning, as people use the law to argue a point, use the procedure to know what to do, or use the tool to perform an action. I would argue that the process of reification so construed is central to every practice. Any community of practice produces abstractions, tools, symbols, stories, terms, and concepts that reify something of that practice in a congealed form. (Wenger, 1998, pp. 58-59)

Further, like Wegner, I am interested in the phenomenon as referring to a process as well as its products:

> Reification can refer both to a process and its products, and I will use the term in both senses. The liberty is not just a lack of rigor, but part of the point. If meaning exists only in its negotiation then, at the level of meaning, the process and the product are not distinct. Reification is not just objectification; it does not end in an object. It does not simply translate meaning into an object. On the contrary, my use of the concept is meant to suggest that such translation is never possible, and that the process and the product always imply each other. (Wenger, 1998, p. 60)

In the Art Case, products of reification are certainly present, namely, the Sun App, the Moon App and the Stars App. But these products, these physical artifacts, are not just developed and finished. On the contrary, they are continually adapted and linguistically expanded to serve boundary negotiations. They serve to reify, concretise and materialise discussions without actually being present, erasing some of their specificity, allowing interpretational flexibility and opening up boundary negotiation. Even though they share characteristics with inclusion/exclusion and borrowed artifacts, this non-present, linguistic emergence is their main trait. I

therefore suggest adding a category to Lee's typology of boundary negotiating artifacts, namely, what I term 'reifying symbolic artifacts'.

Three things characterise reifying symbolic artifacts:

1) They are non-present physically, present only in a symbolic sense, adapted linguistically to serve boundary negotiation.

2) They reify positions and thus serve to concretise and materialise the boundary negotiation, yet without the specificity of reified artifacts being physically present.

3) They are typically known symbols, either because the artifacts they symbolise are shared (developed together like the Sun App, the Moon App and the Stars App), well known (artifacts of high relevance or status in a community like the External App) or common (everyday artifacts like the Leatherman, the phone, the Swiss knife and the kitchen machine).[32]

The increase in reifying symbolic artifacts throughout the Art Case can be interpreted as a concrete manifestation of the changing understanding of digital technology, described in the first part of the analysis, Chapter 4. Thus, the negotiations become increasingly materialised and concretised because the choice of technology is no longer defined due to the loss of impact of the application for funding. The tendency reaches a climax at the end of the Stars Project when the reifying symbolic artifacts correlate into an actual reification, namely, the choice of another solution format, a stationary iPad solution.

This stationary iPad solution functions as a boundary object. Already in the name given, 'digital museum label', we spot its double-sided nature. It merges a traditional museum tool (museum label) with technology (digital) and very adequately coordinates the differing positions. This digital museum label is not a consensus; rather, it is a resolution that contains 'at every stage the traces of multiple viewpoints, translations and incomplete battles' (Star & Griesemer, 1989, p. 413). It is described as 'simple, yet complex underneath' and it can simultaneously be seen as broadly and narrowly targeted since it appeals to different target groups and includes different functions, although still in a delimited fashion due to the solution format and the structuring of content. It creates coherence across the differing positions, and what we witness is thus the making of a boundary object in the chaotic collaborative

---

[32] I borrow the word 'common' from Blumer (1969): 'Out of a process of mutual indications common objects emerge – objects that have the same meaning for a given set of people and are seen in the same manner by them' (p. 11).

design between different social worlds that lack pre-existing standards. Importantly, this example does not illustrate the maintenance of coherence that is central in Star and Griesemer's (1989) construction of the concept; it simply illustrates its creation.

As Benjamin tells me, this creation only comes into existence, only emerges, because the digital designers are allowed to step over the museum threshold and truly interact with the museum staff:

> Benjamin: We couldn't have suggested such a proposal, or it's as much their proposal as ours; however, it's a proposal that steps back and is rather old fashioned in a way. It's a modernisation, but it's something as old fashioned as a museum label. We could never have gotten there if we hadn't had the knowledge about them and what their visitors wanted [...] We would never have suggested that to a new customer we didn't know at all, and we would never have proposed something that was so radically different from what they had asked for after only one user workshop. That would never have happened. So in that way, the process has evolved really well because they [the museum staff] have basically come up with the ideas. This is what we always seek to achieve, and sometimes, it just doesn't work out at all. Sometimes, we just sit there and think, okay, we'll just end up suggesting the first idea we had when we first heard about the project because we're stuck. (Interview, 040813)

5.3. CONCLUDING DISCUSSION

In this chapter, we have indulged in negotiations of particular relevance to one of the cases, namely, the Art Case. I have constructed three positional maps of the Sun Project, the Moon Project and the Stars Project, displaying the variety of positions present in terms of the quality of designing a simple, narrowly targeted solution versus a complex, broadly targeted solution. After having constructed the maps, I have further analysed and interpreted them in relation to findings from collaborative exhibition design research and in relation to the boundary negotiation circulating the middle axes of the maps: the vertical axis of ambiguity and the horizontal axis of reification, as I call them.

The analysis supports findings from other studies that portray collaborative museum design processes as messy affairs, full of a diversity of positions, values, curriculum theory ideals, communities of practice and the like shaping the process and the products. Thus, in the Danish context of developing digital museum communication, we see some of the same

opposing viewpoints as in the American and English contexts of exhibition making. Most pertinently in the Art Case, the opposition between ideals of the forum mode and a laissez-faire, constructivist/problem-solving curriculum theory and ideals of the visitor attraction mode and a narrative curriculum theory. Based on my conclusions, I argue, however, that research about collaborative museum design should further explore *not just* heterogeneity, but more particularly what happens *at the boundaries* of heterogeneity. In the Art Case, I find two boundary phenomena to be particularly relevant in this regard, namely, ambiguity and reification. Three conclusions emerge from this exploration.

Firstly, the positional maps can be used to showcase positional emergence in the dynamic interplay between centripetal and centrifugal forces pushing and pulling the positions in a counter-clockwise pattern. Ambiguity is the anchor of this movement, opening the door to change, even though change is difficult.

Secondly, in this movement, we see that centripetality goes from being mostly related to perceived structural conditions in the Sun Project to being mostly related to materiality in the Stars Project. Here, the various artifacts have a central role in strengthening positions and expanding the negotiations. I interpret the increase of these artifacts as a concrete manifestation of the changing understanding of technology described in the first part of the analysis, Chapter 4. Thus, the negotiations become increasingly materialised and concretised because the choice of technology is no longer defined due to the loss of impact of the application for funding. The many artifacts present on the positional map of the Stars Project signify this change.

Thirdly, when investigating these artifacts more closely, they turn out to be similar to boundary negotiating artifacts, such as inclusion/exclusion artifacts and borrowed artifacts, yet different in terms of their non-present and symbolic character. To highlight the difference, I coin a new type of boundary negotiating artifact: reifying symbolic artifacts. Since idea and concept development is my primary focus, this kind of artifact might have particular relevance in such phases. This suggests that different kinds of boundary negotiating artifacts have a dissimilar presence and significance in diverse phases of development processes. With help from these reifying symbolic artifacts, materiality is negotiated, and a new solution format arises that is truly co-designed and serves as a boundary object coordinating the differing positions.

Is this new co-designed, position-coordinated solution format thus a happy ending? Or is it, as some have asked me, just a technological fix benefitting

those who have developed it and not the technological product in itself or those who are supposed to use it? Two issues yet untouched are worth discussing in relation to these questions: Firstly, the power of technological products and users in the collaborative design processes and, secondly, the usefulness of the new co-designed, position-coordinated solution format.

To begin with power, one could reasonably question whether the technological products and the potential users are implicated actors and actants, i.e. constructed by others for their own purposes, only discursively present or silenced, ignored and invisible to those in power (Clarke, 2005; Clarke & Montini, 1993). Clearly, there is a lot of discursive construction in the negotiations between the museum staff and the digital designers. Technological products and other artifacts are discursively constructed for boundary negotiation, e.g. the reifying symbolic artifacts, and users are imagined in certain ways, supporting certain positions. As Macdonald (2002) has similarly pointed out in relation to exhibition development, the product (in her case, an exhibition) is continually being configured by museum staff, and users are throughout the process of exhibition-making likewise configured, imagined, idealised, standardised and generalised in certain ways more or less implicitly (pp. 157-191, building especially on Woolgar, 1991).

In the Art Case, I would argue that the status of technological products and users change. In the beginning of the Sun Project, they are largely implicated due to the application for funding. In the Moon Project and the Stars Project, they are however less implicated for two reasons. Firstly, technological products are developed into physical form, concretely showcasing what works and what doesn't. Similarly, potential users are physically involved in user workshops (held in the ideation phase of the last two projects), invited to participate and represent themselves on their own terms. Secondly, the museum staff and digital designers evaluate the products and the user workshops in different ways, and these evaluations are not ignored but have great significance for the boundary negotiation and the choice of another solution format. For instance, 'the third option' (the middle-right position) suggested in the Moon Project, is directly related to the statements from potential users in the user workshop held in the Moon Project. Also, the choice of a new solution format is heavily based on the boundary negotiation partly enacted by the technological products developed.

Still, one could argue that these examples construct the often non-present technological products and users in certain ways for certain purposes, and to answer the question more fully, I should myself have paid more attention to these actors and actants. Even though technological products and users play

significant roles in my analysis, I only touch on them in relation to collaborative design interaction between museum staff and digital designers. Thus, I have chosen to focus on the emergence of digital museum communication in collaborative design interaction between museum staff and digital designers, well aware that their work is intertwined with other actors, actants, social worlds and arenas. Furthermore, the emergence of digital museum communication does not end in this collaborative design interaction but evolves not just 'behind the scenes' of the museum, but also 'at the scenes' and beyond (Macdonald, 2002, p. 204).

My focus also excludes an exploration of these matters. Thus, to refer to the second issue worth discussing, I cannot assess the new co-designed, position-coordinated, solution format from the viewpoint of the user. This, I would say, can be seen as both a weakness and a strength. Evidently, it is a weakness that I do not engage holistically with the emergence of digital museum communication. I thus paint a partial picture that does not visualise the implied benefits of boundary negotiation and co-design in terms of the concrete outcomes in the Art Case. On the contrary, it is a strength that the picture becomes more detailed and relevant since a particular focus is chosen, a focus not typically chosen in a museum context.

This focus on the social – the collaborative design interaction between museum staff and digital designers – was not chosen randomly or from the outset; it has been developed continuously in relation to existing literature and theory, empirical encounters and analytical exercises, as carefully outlined in the first chapters. Based on all these elements, I situate my study in a certain way, and I have very carefully tried to account for this situationality. Thus, my intention is not to treat everything in a symmetrical or holistic manner.[33] Rather, I paint a partial picture, well aware that the motif could have been infinitely bigger or infinitely smaller. Important to state, this painting is based on positive assumptions about collaborative design and a belief that collaborative design can and should be assessed in many ways, not just in relation to concrete outcomes (Détienne, Baker, & Burkhardt, 2012).

Nevertheless, I find it interesting to ask the museum staff and digital designers how they themselves assess the new solution. In their opinion, there is no doubt that the Stars App is useful and innovative, and not just in

---

[33] In making this point, I am inspired by Don Ihde's (2002) debates with Donna Haraway, Andrew Pickering, and Bruno Latour, see the chapter 'You Can't Have It Both Ways: Situated or Symmetrical'. Clearly, I differentiate my work from an ANT approach epistemologically. As mentioned above, I do no pay much attention to non-human actors or networks more broadly but focus on social aspects. This is a meaningful focus in and because of the particular situation studied. Thus, in my view, situationality precedes both holisticality and symmetricality, or 'classic' conventions of e.g. ANT. Such conventionality can of course be discussed, e.g. Olesen & Kroustrup (2007) and Gad & Jensen (2007).

a shiny way. On the contrary, it is useful exactly because it is not 'too innovative'. In talking about this issue with Julia and Benjamin in my last interview with them, Julia says that the Stars App solution is 'innovative in the traditional way'. Quite similar to what Emma says when I ask her:

> Me: Do you think your solution is innovative?
>
> Emma: Yes, I think it is, in the way that we dare to cut to the bone; to do something enormously simple that is yet complex underneath [...] So it's actually an attempt to try to open up something experimental through something traditional and safe, to move people to a new point. And I think we have learned in the process that that's the way to do it because in the Moon Project, we were too experimental in terms of what our visitors were ready for [...] And since it is just a video at first [in the Stars App], next to the art piece, and you then suddenly realise that there is much more; 'I can go home and open it up'. And the wrapping is done in a very simple manner. To give people a greater experience in that way; I hope that will be the result. (Interview, 091613)

Clearly, users are imagined in certain ways in this statement, but the imagination is no longer dominated by technological infatuation. On the contrary, it is based on real encounters and experimentation with the users and with the best intentions in mind: to give people a greater experience. Like Emma, we can hope that these intentions will be fulfilled. Our story – the story about how digital museum communication emerges in collaborative design interaction between museum staff and digital designers – thus ends here. With hope and the best intentions.

6

CONCLUSION

> I have only lately realized that I never aspired to be a scientist, but rather a certain kind of writer. When you talk with me about my research, do not ask me what I found; I found nothing. Ask me what I invented, what I made up from and out of my data. But know that in asking you to ask me this, I am not confessing to telling any lies about the people or events in my studies/stories. I have told the truth. The proof for you is in the things I have made – how they look to your mind's eye, whether they satisfy your sense of style and craftsmanship, whether you believe them, and whether they appeal to your heart.
>
> (Sandelowski, 1994, p. 61)

I begin my conclusion with Sandelowski's candid words to once again stress my constructivist perspective. Indeed, the stories I have told are true and made from and out of my data, but they are constructed in certain ways, and they should be approached with that in mind – as should all research, all science and all claims about the world we live in.

What is the relevance and generalisability of this construction in front of you? While some constructivists shy away from dealing with such a question, I do find it both possible and desirable to learn from the cases I have told stories about, in spite of their specificity (Halkier, 2011). I do not seek to draw universal conclusions. On the contrary, I see generalisation as producing 'contextbound typicalities' (Halkier, 2011, p. 788), acknowledging that a situation is unique and typical at the same time (Delmar, 2010). This kind of generalisation can be produced and increased in different ways (see Halkier (2011) and Flyvbjerg (2006)). In relation to my work, three things are worth mentioning.

Firstly, the way in which I have selected the cases helps me to point out typicalities across differing contexts and within a particularly significant context (see section 3.1.3). Due to this selection, the typicalities are, to some extent, likely to be relevant for other cases. Secondly, I have analysed my data in relation to conclusions from other studies and broader theoretical constructs. For this purpose, I have used different analytical procedures, arguably similar to ideal-typologizing, category zooming and positioning – three procedures mentioned by professor of communication Bente Halkier as particularly useful for producing analytical generalisation (Halkier, 2011).[34] Thirdly, I have tried to build a transparent, systematic and coherent construction to empower the reader to assess whether my conclusions have relevance for his/her context and interest.

Having these reflections on generalisability in mind, I will finish the thesis with a short summary of the conclusions offered and an overview of research contributions and suggestions based upon them.

6.1. A SHORT SUMMARY FROM A MOVE BEHIND THE DIGITAL

The overall aim of the thesis has been to explore how digital museum communication emerges in collaborative design interaction between museum staff and digital designers. Thus, I have argued for advancing and nuancing knowledge on the interrelation between museums, cultural heritage and digital phenomena by moving behind the digital to explore how it is produced in practice. More particularly, I have showcased a scarcity of knowledge on collaborative design interaction between museum staff and digital designers.

To explore this issue, I have followed collaborative design interaction in two quite distinctive cases for more than 1.5 years using ethnographic methods. Furthermore, I have compared some of my conclusions from these two primary cases with interview data from a small number of supplementary cases. Using different mapping approaches from situational analysis (Clarke, 2005), I have analysed my data in relation to the three sub-research questions posed to specify the main research question. As a reminder, the research questions are inserted below:

---

[34] In 'ideal typologizing', the idea is to analyse and highlight differences by slicing up data in relation to different ideal types, as is, for instance, done in the continuum of technology conceptualisations presented in Chapter 4. In 'category zooming', the point is to go into depth with a particular, single aspect, as done by zooming in on the analytical focal point in the analysis presented in Chapter 5 (the positional maps analysis). This part of the analysis also exemplifies 'positioning' in which social dynamics and emergence are analysed, drawing inferences about positions (Halkier, 2011).

How does digital museum communication emerge in collaborative design interaction between museum staff and digital designers?

1. How are digital designers involved in these collaborative design processes?

2. How is digital museum communication understood in these collaborative processes?

3. How is digital museum communication negotiated and co-designed in these collaborative processes?

In the first part of the analysis, Chapter 4, I have touched on how digital designers are involved in collaborative design processes and how digital museum communication is understood in these processes (sub-research questions 1 and 2). By using social worlds/arenas maps, I have showcased a parallel pattern in the two primary cases in terms of how digital designers are involved, and I have argued that this pattern is largely related to how digital museum communication is understood. In the beginning of the cases, they are both dominated by a technocentric, deterministic and fixed conception nourished by the Danish funding system. Throughout the processes, the participants continually redefine the understanding of digital museum communication and the role of digital designers in the initial idea development. Thus, I have pointed to a problematic gap between what is perceived as necessary to get funding (technocentric, deterministic views on technology) and what is perceived as essential for developing meaningful digital museum communication (human/context-centric, constructivist views on technology).

In the second part of the analysis, Chapter 5, I have used positional maps to investigate and present how digital museum communication is negotiated and co-designed in one of the primary cases, the Art Case (sub-research question 3). In relation to the analytical focal point chosen, I have shown how negotiation and co-design take place at the boundaries between a variety of differing positions. I have further investigated these boundaries in a temporal perspective by interpreting the positional maps in light of positional emergence (using Bakhtinian concepts) and artifactual emergence (using theory of boundary objects and boundary negotiating artifacts). In this interpretation, I have highlighted the importance of ambiguity and reifying symbolic artifacts, a category of boundary negotiating artifacts suggested to account for the increasing materialization of negotiations in the Art Case.

Overall, the four conceptual anchor points (involving, understanding, negotiating and co-designing) have, in different ways, proven useful for showcasing and understanding the emergence of digital museum communication in collaborative design interaction. By moving behind the digital to explore emergence in this way, I have illustrated that digital museum communication is not inherently good or easy to cultivate but practiced in certain ways – related to how designers are involved, how digital museum communication is understood and how it is negotiated and co-designed.

For further discussions of and reflections on the conclusions summarised above, please see the concluding discussions ending the analysis chapters, Chapter 4 and Chapter 5. This final conclusion is primarily intended as a summary. In the following section, I furthermore specify these conclusions in a more concrete and perspectival overview of research contributions and suggestions.

6.2. CONTRIBUTIONS AND SUGGESTIONS

6.2.1. Contributions to and suggestions for museum practice and research

The first and foremost aim of the thesis has been to contribute to museum practice and research on digital museum communication. I achieve this aim by exposing the complexities of practically producing digital museum communication. Thereby, I extend the limited theoretically-informed knowledge on digital museum practice behind the scenes, particularly in relation to collaborative design interaction between museum staff and digital designers. Overall, the thesis stresses the importance of focusing on process over product when developing digital museum communication. In the following sections, I outline suggestions related to this conclusion. The first three parts present suggestions on the three sub-research questions posed. The final two sections present suggestions for funding bodies supporting digital museum communication and for digital museum communication research.

There is no straightforward answer to when and how digital designers should be *involved* in collaborative design processes since different situations require different approaches and considerations. This point has been richly illustrated in the diverse ways of involving designers in the two primary cases and the supplementary cases (see Chapter 4 for narrative accounts of different approaches and considerations in practice). Whether sooner or

later, there is however a need for a deep understanding of and interaction with the museum context in order for digital designers to develop meaningful digital museum communication. Thus, it might not be a matter of simply being physically involved in meetings in early phases of a project but, rather, when involved, being deeply involved and having agency in terms of the initial idea development. Importantly, this does not mean that digital designers should dominate or that museum staff should leave responsibility to digital designers.

On the contrary, digital museum communication should be *understood* as a dynamic, shared work, product and responsibility. Following principles of human/context-centric and constructivist views, technology should not be developed for the sake of technology or be seen as something with special qualities that impact in certain ways. Rather, technology should be developed in relation to the concrete museum context, acknowledging that it can be better to develop low-tech solutions with substance and long durability instead of high-tech ones. The continuum of technology conceptualisations developed in Chapters two and four can be a useful tool to reflect on different views on technology that can co-exist in a collaborative process of designing digital museum communication (inserted below as a reminder, Figure 18). As we have seen in the analysis chapters (Chapter 4 and Chapter 5), these different views on technology have great significance for and in practice.

Techno-centrism

Technological solutions as starting point to 'sell' a project; technology as primary; for the sake of technology

Human/context-centrism

The museum as starting point; technology as secondary; for the sake of the story/communication

Determinism

Technology has special qualities that impact in certain ways – technophilic (hype, infatuation, high-tech) vs. technophobic ways (a big monster, a threat)

Constructivism

The qualities of technology are developed in relation to the museum context (e.g. it is better to have meaningful low-tech solutions with substance and long durability)

Weakening co-design

Fixing technology in applications for funding; technology as something that 'fits into a template', thus leading to disappointment and superficial solutions

Deepening co-design

Seeing technology as a dynamic, shared work, product and responsibility; design as a complex maturation process – a car with differently pumped tyres
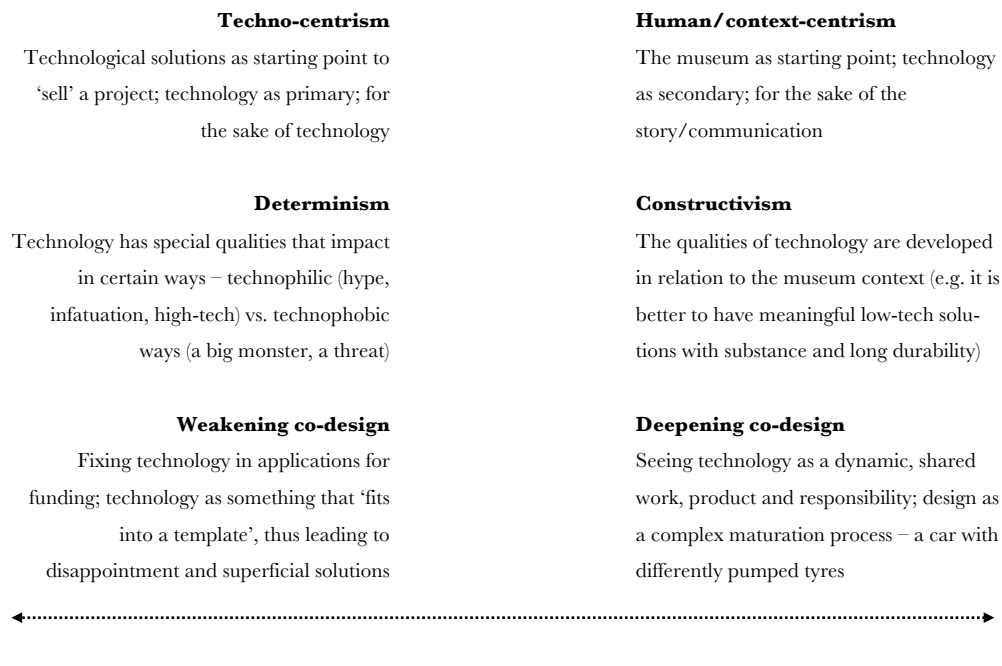
Figure 18: Continuum of technology conceptualisations: Views on digital museum communication (introduced in section 4.4)

In *negotiating and co-designing* digital museum communication in the Art Case, we see the benefits of being open-minded and respectful towards the positions and knowledge of others. Thus, the museum staff and digital designers end up with a truly co-designed solution because they learn from each other and negotiate on the boundaries between differing positions. More concretely, this implies that it can be useful to be attentive to and explore differences, conflicts and ambiguity in a constructive manner in order to develop new, boundary-crossing ideas. In particular, ambiguity should be recognised as a potentially valuable boundary phenomenon that deserves careful exploration practically and theoretically to concretely enrich development projects and abstractly empower theory about them.

Additionally, the thesis points to the value of involving potential users and taking their positions and knowledge seriously for boundary negotiation and co-design. Furthermore, it can be beneficial for boundary negotiation and co-design to develop and/or evaluate concrete artifacts together (technological or otherwise) to make negotiations more material and concrete. When including these actors and actants in negotiations, museum staff and digital designers should however be reflexive about how they configure and imagine them.

While I greatly value and respect the general contribution of *the Danish funding system*, I find the gap unravelled in the thesis highly problematic. Thus, there seems to be a gap between what is perceived as necessary to get funding (technocentric, deterministic views on technology) and what is perceived as essential for developing meaningful digital museum communication (human/context-centric, constructivist views on technology). To overcome this gap, I encourage funding bodies to grant money on the basis of process rather than product specifications and to increasingly support deep levels of co-design. In line with this, I recommend that funding bodies explore alternative funding programmes. The stepped programme proposed by Clay, Latchem, Parry, & Ratnaraja (2014), whereby funding is granted for different steps of development, could be a possible alternative (introduced in section 2.2.3). In such a programme, money can be granted not just for constructing a proposed idea but also for developing it and experimenting with it.

Further *research* should be conducted to look into these funding issues. In particular, I find it pertinent to more carefully explore whether what is perceived as the way to get funding for developing digital museum communication is what is actually favoured, communicated and/or intended by funding bodies. Additionally, I want to stress once again the limited amount of theoretically informed research on how digital museum communication is practically produced behind the scenes. Thus, research on

digital museum communication has primarily been preoccupied with what happens outside museum organisations and not inside them. To avoid a simplistic treatment and understanding of digital museum communication, a varied exploration of the phenomenon is needed. I therefore suggest directing more attention to what happens behind the scenes in research on digital museum communication by using a plurality of approaches and methods.

6.2.3. Methodological contributions and suggestions

The main methodological contribution of the thesis is my expansion of situational analysis towards what I term 'temporal situational analysis'. Similar to Clarke (2005), my point is not to propose changes to situational analysis per se (in Clarke's case, to grounded theory). On the contrary, my aim is to push situational analysis to more fully engage with temporality and, in particular, how things emerge across boundaries.

Firstly, I have suggested pushing situational analysis from being mostly concerned with meso-level mapping to include more small-range process mapping in order to better explore everyday emergence. For this purpose, I have secondly introduced temporal bracketing as a helpful tool to reflexively bracket emergence in periods of time on which to create mappings. Thirdly, I have proposed to more fully embrace presentational opportunities of situational analysis, and not mainly analytical ones, to showcase emergence and temporal complexity. In the methods chapter, I demonstrate how such a temporal situational analysis can be performed. Additionally, the analysis chapters exemplify how it can be used for presentational purposes.

This temporal expansion of situational analysis is likely to be useful for other studies interested in analysing process, emergence and temporal complexity. Indeed, it could be valuable to test and develop my suggestions in relation to other cases and contexts.

6.2.2. Theoretical contributions and suggestions

The principal theoretical contribution of the thesis is my suggestion to add a category to Lee's (2004, 2007a) typology of boundary negotiating artifacts, namely, what I term 'reifying symbolic artifacts'.

Three things characterise reifying symbolic artifacts:

1. They are non-present physically, present only in a symbolic sense, adapted linguistically to serve boundary negotiation.

2. They reify positions and thus serve to concretise and materialise the boundary negotiation, yet without the specificity of reified artifacts being physically present.

3. They are typically known symbols, either because the artifacts they symbolise are shared (developed together like the Sun App, the Moon App and the Stars App), well known (artifacts of high relevance or status in a community like the External App) or common (everyday artifacts like the Leatherman, the phone, the Swiss knife and the kitchen machine).

Since idea and concept development is my primary focus, this kind of artifact might have particular relevance in such phases, suggesting that different kinds of boundary negotiating artifacts have dissimilar presence and significance in disparate phases of development processes – a suggestion that deserves further exploration in other design contexts. In addition, I have shown how these reifying symbolic artifacts are connected to the creation of a boundary object. However, I account for this connection quite superficially, and it should be explored more carefully in relation to other contexts, as should the suggested new category of boundary negotiating artifacts.

Another theoretical contribution is my concrete and visual adaptation of Bakhtin's (1981) notions of centripetal and centrifugal forces to interpret positional emergence. Indeed, this adaptation is an attempt to map temporal complexity, and, as an ending remark, I would like to state that I have not entirely succeeded in this pursuit. Thinking back on Italo Calvino's opening lines about Mr. Palomar, grasping time and temporal complexity is thus not possible. But this does not mean that we should not try to grasp it anyway:

> ...our research processes and assumptions need enhanced capacities to grasp and interpret complexities and heterogeneities of social life empirically (e.g., Haraway 1999; Lather 2001a, n.d.). We need methods for research and analysis to support our yearnings (hooks 1990), our desires to know (savoir), and our will to know (Burchell, Gordon, & Miller 1991; Foucault 1972, 1973), both for knowledge itself and for the potential such knowledges may offer for making life on the planet better. (Clarke, 2005, p. xxvi)

REFERENCES

Adegoroye, D., Arch, N., Hamer, J., Houlihan, M., Lavis, D., King, V., et al. (2000). *Skills Foresight in the Cultural Heritage Sector 2000-2010.* Bradford: Cultural Heritage National Training Organisation.

Allwood, J., Traum, D., & Jokinen, K. (2000). Cooperation, dialogue and ethics. *International Journal of Human-Computer Studies, 53*, 871-914.

Anderson, R., Baxter, L., & Cissna, K. (Eds.). (2004). *Dialogue: Theorizing Difference in Communication Studies.* Thousand Oaks: Sage Publications.

Atwood, M. E., McCain, K. W., & Williams, J. C. (2002). How does the design community think about design. *Proceedings of the 4th Conference on Designing Interactive Systems* (pp. 125-132). New York: ACM Press.

Bacon, F. (1853). Novum organum. In *The physical and metaphysical works of Lord Bacon* (Vol. 1). London: H. G. Bohn.

Bakhtin, M. M. (1981). *The dialogic imagination: Four essays by M. M. Bakhtin.* (M. Holquist, Ed., C. Emmerson, & M. Holquist, Trans.) Austin: University of Texas Press.

Bakhtin, M. M. (1984). *Problems of Dostoevsky's Poetics.* (C. Emerson, Ed., & C. Emerson, Trans.) Minneapolis: University of Minnesota Press.

Bakhtin, M. M. (1986). *Speech Genres and Other Late Essays.* (C. Emerson, M. Holquist, Eds., & V. W. McGee, Trans.) Austin: University of Texas Press.

Baxter, L. (2006). Dialogue. In G. Sheperd, J. St. John, & T. Stripdhas (Eds.), *Communication as… Perspectives on Theory* (pp. 101-109). London: Sage.

Baxter, L. (2011). *Voicing Relationships: A Dialogic Perspective.* Thousand Oak: Sage.

Bech-Danielsen, A. (2014, October 31). Danske museer famler med de digitale teknologier. *Politiken.* Retrieved from http://www.politiken.dk.

Bijker, W. E., Hughes, T. P., & Pinch, T. J. (1987). General Introduction. In W. E. Bijker, T. P. Hughes, & T. J. Pinch (Eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge: The MIT Press.

Bille, T., & Lorenzen, M. (2008). Den danske oplevelsesøkonomi: Afgrænsning, økonomisk betydning og vækstmuligheder. Frederiksberg: Samfundslitteratur.

Bizzi, L., & Langley, A. (2012). Studying processes in and around networks. *Industrial Marketing Management, 41*, 224–234.

Black, G. (2005). *The Engaging Museum: Developing Museums for Visitor Involvement.* London: Routledge.

Blomberg, J., Burrell, M., & Guest, G. (2003). An ethnographic approach to design. In J. Jacko, & A. Sears (Eds.), *The Human-Computer Interaction Handbook.* New Jersey: Lawrence Erlbaum Associates.

Blumer, H. (1937). Social Psychology. In E. Schmidt (Ed.), *Man and Society. A Substantial Introduction to the Social Sciences.* New York: Prentice-Hall.

Blumer, H. (1966). Sociological Implications of the Thought of George Herbert Mead. *American Journal of Sociology, 71* (5), 535-544.

Blumer, H. (1969). *Symbolic Interactionism: Perspective and Method.* Englewood Cliffs: Prentice-Hall.

Boast, R. B. (2011). Neocolonial Collaboration: Museum as Contact Zone Revisited. *Museum Anthropology, 34* (1), 56-70.

Boddington, A., Boys, J., & Speight, C. (Eds.). (2013). *Museum and Higher Education Working Together.* Surrey: Ashgate.

Bossen, C., & Lauritzen, P. (2007). Symbolsk interaktionisme og STS. In C. B. Jensen, P. Lauritzen, & F. Olesen (Eds.), *Introduktion til STS* (pp. 139-156). Copenhagen: Hans Reitzels Forlag.

Bowen, J. P. (2000). The Virtual Museum. *Museum International, 205* (1), 4-7.

Bratteteig, T. (2007). Design Research in Informatics: A response to Iivari. *Scandinavian Journal of Information Systems, 19* (2), 65-73.

Bratteteig, T., & Stolterman, E. (1997). Design in groups – and all that jazz. In M. Kyng, & L. Mathiassen (Eds.), *Computers and Design in Context* (pp. 289-312). Cambridge: The MIT Press.

Brenna, B. (2009). Hvad gjør museologi? *Nordisk Museologi, 1*, 63-75.

Bucciarelli, L. L. (1988). An ethnographic perspective on engineering design. *Design Studies, 9* (3), 159-168.

Burcaw, G. E. (1997). *Introduction to Museum Work.* Walnut Creek: Altamira Press.

Callon, M. (1987). Society in the Making: The Study of Technology as a Tool for Sociological Analysis. In W. E. Bijker, T. P. Hughes, & T. J. Pinch (Eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge: The MIT Press.

Calvino, I. (1985). *Mr. Palomar.* (W. Weaver, Trans.) New York: Harcourt Brace & Company.

Cameron, F., & Kenderdine, S. (Eds.). (2007a). *Theorizing Digital Cultural Heritage: A Critical Discourse.* Cambridge: The MIT Press.

Cameron, F., & Kenderdine, S. (2007b). Introduction. In F. Cameron, & S. Kenderdine (Eds.), *Theorizing Digital Cultural Heritage: A Critical Discource* (pp. 1-16). Cambridge: The MIT Press.

Carder, P. C. (2008). Managing medication management in assisted living: A situational analysis. *Journal of Ethnographic and Qualitative Research, 3*, 1-12.

Charmaz, K. (1995). Between Positivism and Postmodernism: Implications for Methods. *Studies in Symbolic Interaction, 17*, 43-72.

Charmaz, K. (2000). Grounded Theory: Objectivist and Constructivist Methods. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 509-536). Sage: Thousand Oaks.

Charmaz, K., & Bryant, A. (Eds.). (2007). *Handbook of Grounded Theory.* London: Sage.

Chun, S., Jenkins, M., & Stein, R. (2007). Open Source, Open Access: New Models for Museums. In H. Din, & P. Hecht (Eds.), *The Digital Museum: A Think Guide* (pp. 135-146). Washington: American Association of Museums.

Clarke, A. E. (2003). Situational Analyses: Grounded Theory Mapping After the Postmodern Turn. *Symbolic Interaction, 26* (4), 553-576.

Clarke, A. E. (2005). *Situational Analysis: Grounded Theory After the Postmodern Turn.* Thousand Oaks: Sage Publications.

Clarke, A. E., & Charmaz, K. (2014). *Grounded Theory and Situational Analysis.* London: Sage.

Clarke, A. E., Friese, C., & Washburn, R. (Eds.). (forthcoming). *Situational Analysis in Practice: Mapping Research with Grounded Theory.* Walnut Creek: Left Coast Press.

Clarke, A. E., & Keller, R. (2014). Engaging Complexities: Working Against Simplification as an Agenda for Qualitative Research Today. Adele Clarke in Conversation With Reiner Keller. *Forum: Qualitative Social Research, 15* (2).

Clarke, A. E., & Montini, T. (1993). The Many Faces of RU486: Tales of Situated Knowledges and Technological Contestations. *Science, Technology and Human Values, 18* (1), 42-78.

Clarke, A. E., & Star, S. L. (2003). Science, Technology and Medicine Studies. In N. J. Herman-Kinney, & L. T. Reynolds (Eds.), *Handbook of Symbolic Interactionism* (pp. 539-574). Walnut Creek: AltaMira.

Clay, R., Latchem, J., Parry, R., & Ratnaraja, L. (2014). *Collaborative arts triple helix report.* Retrived from http://www.cathproject.org.uk/.

Clifford, J. (1997). Museums as Contact Zones. In J. Clifford (Ed.), *Routes: Travel and Translation in the Late Twentieth Century* (pp. 188-219). Cambridge: Harvard University Press.

Cooper, C. L. (2013). A case study in collaboration: displaying Greece and Rome at the Fitzwilliam Museum, Cambridge, UK. *Museum Management and Curatorship, 28* (5), 467-49.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* Los Angeles: Sage.

Cross, N. (2007). From a Design Science to a Design Discipline: Understanding Designerly Ways of Knowing and Thinking. In R. Michel (Ed.), *Design Research Now* (pp. 41-54). Basel: Birkhäuser.

Cross, N., & Cross, A. C. (1995). Observations of teamwork and social processes in design. *Design Studies, 16*, 143-170.

Cunliffe, A. L., Helin, J., & Luhman, J. T. (2014). Mikhail Bakhtin (1895-1975). In J. Helin, T. Hernes, D. Hjorth, & R. Holt (Eds.), *The Oxford Handbook of Process Philosophy & Organization Studies* (pp. 333-347). Oxford: Oxford University Press.

Dahler-Larsen, P. (2002). *At fremstille kvalitative data.* Odense: Odense Universitets Forlag.

D'Andrade, R. (1995). *The development of cognitive anthropology.* Cambridge: Cambridge University Press.

Danish Business Authority, & Center for Cultural and Experience Economy. (2011). Vækst via oplevelser 2011: En analyse af Danmark i oplevelsesøkonomien. Copenhagen: Rosendahls Schultz Grafisk.

Danish Ministry of Culture. (2006). *Udredning om museernes formidling.* Copenhagen: Sangill Grafisk Produktion.

Davies, S. M. (2010). The co-production of temporary museum exhibitions. *Museum Management and Curatorship, 25* (3), 305-321.

Davies, S. M. (2011). *Co-production and Values in Museums: With Special reference to the production of temporary exhibitions in Britain.* (Unpublished PhD thesis). The Open University, Bucks.

Davies, S. M., Patona, R., & O'Sullivana, T. J. (2013). The museum values framework: a framework for understanding organisational culture in museums. *Museum Management and Curatorship, 28* (4), 345-361.

Delmar, C. (2010). 'Generalizability' as recognition: Reflections on a foundational problem in qualitative research. *Qualitative Studies, 1*, 115-128.

Denzin, N. K. (1970). *The Research Act: A Theoretical Introduction to Sociological Methods.* Rutgers: Transaction Publishers.

Denzin, N. K., & Lincoln, Y. S. (2011). Introduction: The Discipline and Practice of Qualitative Research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research.* Los Angeles: Sage.

Détienne, F., Baker, M., & Burkhardt, J. (2012). Perspectives on quality of collaboration in design. *CoDesign: International Journal of CoCreation in Design and the Arts, 8* (4), 197-199.

Dietz, S. (1998). *CyberMuseology: Taking the museum to the Net/Bringing Digital Media to the Museum.* Web publication no longer accessible. See Larsen, A. H., Gade, R., & Hansen, A. W. (2015).

Din, H., & Hecht, P. (2007). Preface. In H. Din, & P. Hecht (Eds.), *The Digital Museum: A Think Guide* (pp. xi-xii). Washington: American Association of Museums.

Drotner, K., & Laursen, D. (2011). Introduction. *Journal of media and communication research, 50*, 1-6.

Drotner, K., & Schrøder, K. C. (2013). Introduction. In K. Drotner, & K. C. Schrøder (Eds.), *Museum Communication and Social Media* (pp. 1-14). New York: Routledge.

Drotner, K., Weber, C. P., Larsen, B. A., & Løssing, A. S. (Eds.). (2011). *Det interaktive museum.* Frederiksberg: Samfundslitteratur.

Eliot, T. S. (1943). *Four quartets.* Orlando: A Harvest Book, Harcourt, Inc.

Falk, J. H., & Dierking, L. D. (1992). *The Museum Experience.* Washington: Howells House.

Falk, J. H., & Dierking, L. D. (2000). *Visitor Experiences and the Making of Meaning.* Lanham: AltaMira Press.

Feast, L. (2012). Professional perspectives on collaborative design work. *CoDesign: International Journal of CoCreation in Design and the Arts, 8* (4), 215-230.

Fine, G. A. (1993). The Sad Demise, Mysterious Disappearance, and Glorious Triumph of Symbolic Interactionism. *Annual Review of Sociology, 19*, 61-87.

Fischer, D. (2001). Value-Added Consulting: Teaching Clients How to Fish. *Curator, 44* (1), 83-96.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry, 12* (2), 219-245.

Foucault, M. (1973). *The Order of Things: An Archeology of the Human Sciences.* New York: Vintage/Random House.

Friese, C. (2010). Classification conundrums: Classifying chimeras and enacting species preservation. *Theory and Society, 39* (2), 145-172.

Frodeman, R. (2010). Introduction. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford Handbook of Interdisciplinarity* (pp. xxix-xxxix). Oxford: Oxford University Press.

Fujimura, J. H. (1992). Crafting Science: Standardization Packages, Boundary Objects and 'Translation'. In A. Pickering (Ed.), *Science as Practice and Culture* (pp. 168-211). Chicago: The University of Chicago Press.

Gad, C., & Jensen, C. B. (2007). Post-ANT. In C. B. Jensen, P. Lauritsen, & F. Olesen (Eds.), *Introduktion til STS* (pp. 93-118). Copenhagen: Hans Reitzels Forlag.

Galloway, P. (2010). Recoding the Museum: Digital Heritage and the Technologies of Change. Ross Parry. London: Routledge, 2007. 166 pp. Reviewed by Patricia Galloway. *Museum Anthropology Review, 4* (2), 211-213.

Gherardi, S. (2012). *How to Conduct a Practice-based Study: Problems and Methods.* Cheltenham: Edward Elgar Publishing Limited.

Giaccardi, E. (Ed.). (2012a). *Heritage and Social Media. Understanding Heritage in a Participatory Culture.* New York: Routledge.

Giaccardi, E. (2012b). Introduction: reframing heritage in a participatory culture. In E. Giaccardi (Ed.), *Heritage and Social Media. Understanding Heritage in a Participatory Culture* (pp. 1-10). New York: Routledge.

Giddens, A. (1984). *The constitution of society.* Berkeley: University of California Press.

Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Chicago: Aldine Publishing Company.

Gobo, G. (2011). Ethnography. In D. Silverman (Ed.), *Qualitative Research* (3rd ed., pp. 15-34). London: Sage.

Grewcock, D. (2014). *Doing Museology Differently.* Oxon: Routledge.

Guba, E. G. (1990). The Alternative Paradigm Dialog. In E. G. Guba (Ed.), *The Paradigm Dialog* (pp. 17-28). Newbury Park: Sage Publications.

Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the effectiveness of evaluation results through responsive and naturalistic approaches.* San Francisco: Jossey-Bass.

Hafsteinsson, S. B., & Larsen, A. H. (2011). Forord. *Nordisk Museologi, 1*, 1-2.

Halkier, B. (2011). Methodological Practicalities in Analytical Generalization. *Qualitative Inquiry, 17* (9), 787 −797.

Hammersley, M. (2006). Ethnography: problems and prospects. *Ethnography and Education, 1* (1), 3-14.

Handler, R., & Gable, E. (1997). *The new history in an old museum: Creating the past at Colonial Williamsburg.* Durham: Duke University Press.

Hansen, A. H., & Moussouri, T. (2005). 'Fuzzy' boundaries: communities of practice and exhibition teams in European natural history museums. *Museum and Society, 2* (3), 161-174.

Harre, R., & Slocum, N. (2003). Disputes as Complex Social Events: On the Uses of Positioning Theory. *Common Knowledge, 9* (1), 100-118.

Harris, M. (1976). History and Significance of the Emic/Etic Distinction. *Annual Review of Anthropology, 5*, 329-350.

Harrison, J. (2005). Shaping Collaboration: Considering Institutional Culture. *Museum Management and Curatorship, 20* (3), 195-212.

Helin, J., Hernes, T., Hjorth, D., & Holt, R. (Eds.). (2014). *The Oxford Handbook of Process Philosophy and Organization Studies.* Oxford: Oxford University Press.

Henning, M. (2006). *Museums, Media and Cultural Theory.* New York: Open University Press.

Henning, M. (2011). New Media. In S. Macdonald (Ed.), *A Companion to Museum Studies* (pp. 302-318). West Sussex: Wiley-Blackwell.

Hermann, G. (1997). Shortcuts to Oz: Strategies and Tactics for Getting Museums to the Emeral City. In K. Jones-Garmil, & M. L. Anderson (Eds.), *The Wired Museum: Emerging Technology and Changing Paradigms* (pp. 65-91). Washington: American Association of Museums.

Hernes, T. (2014). *A Process Theory of Organization.* Oxford: Oxford University Press.

Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design Science in Information Systems Research. *MIS Quarterly, 28* (1), 75-105.

Holdgaard, N. (2014). *Online Museum Practices: A holistic analysis of Danish museums and their users.* (Unpublished PhD thesis). IT University of Copenhagen, Copenhagen.

Holdgaard, N., & Klastrup, L. (2014). Between control and creativity: challenging co-creation and social media use in a museum context. *Digital Creativity, 25* (3), 190-202.

Holdgaard, N., & Simonsen, C. E. (2011). Attitudes towards and conceptions of digital technologies and media in Danish museums. *Journal of media and communication, 50*, 100-118.

Hughes, T. P. (1987). The Evolution of Large Technological Systems. In W. E. Bijker, T. P. Hughes, & T. J. Pinch (Eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge: The MIT Press.

Hutchison, M., & Collins, L. (2009). Translations: experiments in dialogic representation of cultural diversity in three museum sound installations. *Museum and Society, 7* (2), 92-109.

Ihde, D. (2002). *Bodies in Technology.* Minneapolis: University of Minnesota Press.

Jensen, C. B., Lauritsen, P., & Olesen, F. (Eds.). (2007). *Introduktion til STS.* Copenhagen: Hans Reitzels Forlag.

Jones-Garmil, K. (1997). Laying the Foundation: Three Decades of Computer Technology in the Museum. In K. Jones-Garmil, & M. L. Anderson (Eds.), *The Wired Museum* (pp. 35-62). Washington: American Association of Museums.

Jones-Garmil, K., & Anderson, M. L. (Eds.). (1997). *The Wired Museum: Emerging Technology and Changing Paradigms.* Washington: American Association of Museums.

Kalay, Y. E. (2008). Introduction: Preserving cultural heritage through digital media. In Y. E. Kalay, T. Kvan, & J. Affleck (Eds.), *New Heritage: New Media and Cultural Heritage* (pp. 1-9). Oxon: Routledge.

Kalay, Y. E., Kvan, T., & Affleck, J. (Eds.). (2008). *New Heritage: New Media and Cultural Heritage.* Oxon: Routledge.

Kaldis, B. (Ed.). (2013). *Encyclopedia of Philosophy and the Social Sciences.* Thousand Oaks: Sage.

Kavanagh, G. (1995). Museums in partnership. In E. Hooper-Greenhill (Ed.), *Museum, Media, Message* (pp. 124-134). London: Routledge.

Kéfi, H., & Pallud, J. (2011). The role of technologies in cultural mediation in museums: an Actor-Network Theory view applied in France. *Museum Management and Curatorship, 26* (3), 273-289.

Kelly, L. (2004). Evaluation, Research and Communities of Practice: Program Evaluation in Museums. *Archival Science, 4*, 45-69.

Kelly, L., & Gordon, P. (2002). Developing a community of practice: museums and reconciliation in Australia. In R. Sandell (Ed.), *Musems Society Inequality* (pp. 153-174). London: Routledge.

Kleinsmann, M. S. (2006). *Understanding Collaborative Design.* (Unpublished PhD thesis). Delft University of Technology, Delft.

Kleinsmann, M. S., & Valkenburg, R. (2008). Barriers and enablers for creating shared understanding in co-design projects. *Design Studies, 29*, 369-386.

Kling, R., & Scacchi, W. (1982). The Web of Computing: Computer Technology as Social Organization. *Advances in Computers, 21*.

Krasner, H., Curtis, B., & Iscoe, N. (1987). Communication breakdowns and boundary spanning activities on large programming projects. In G. M. Olson, S. Shepard, & E. Soloway (Eds.), *Empirical studies of programmers: Second Workshop* (pp. 47-64). Norwood: Ablex.

Kvale, S. (2007). *Doing Interviews.* Los Angeles: Sage.

Kvan, T. (2000). Collaborative design: what is it? *Automation in Construction, 9*, 409–415.

Lang, C., Reeve, J., & Woollard, V. (2006). *The Responsive Museum: Working with Audiences in the Twenty-First Century.* Aldershot: Ashgate.

Langley, A. (1990). Strategies for Theorizing from Process Data. *The Academy of Management Review, 24* (4), 691-710.

Langley, A., & Tsoukas, H. (2010). Introducing 'perspectives on process organization studies'. In T. Hernes, & S. Maitlis (Eds.), *Process, sensemaking and organizing* (pp. 1–26). Oxford: Oxford University Press.

Larsen, A. H., Gade, R., & Hansen, A. W. (2015). Redaktionel optakt. In A. H. Larsen, R. Gade, & A. W. Hansen (Eds.), *Cybermuseologi: Kunst, museer og formidling i et digitalt perspektiv.* Aarhus: Aarhus Universitetsforlag.

Lather, P. (2007). *Getting lost: Feminist efforts toward a double(d) science.* Albany: State University of New York Press.

Laudan, R. (1984). *The Nature of Technological Knowledge.* Dordrecht: D. Reidel Publishing Company.

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation.* Cambridge: Cambridge University Press.

Law, J., & Mol, A. (2002). Complexities: An Introduction. In J. Law, & A. Mol (Eds.), *Complexities: Social Studies of Knowledge Practices* (pp. 1-22). Durham: Duke University Press.

Le Dantec, C. A. (2009). Situated Design: Toward an Understanding of Design Through Social Creation and Cultural Cognition. *C&C' 09.* California: ACM.

Lee, C. P. (2004). *The role of boundary negotiating artifacts in the collaborative design of a museum exhibition.* (Unpublished PhD thesis). University of California, Los Angeles.

Lee, C. P. (2007a). Boundary Negotiating Artifacts: Unbinding the Routine of Boundary Objects and Embracing Chaos in Collaborative Work. *Computer Supported Cooperative Work, 16,* 307–339.

Lee, C. P. (2007b). Reconsidering Conflict in Exhibition Development Teams. *Museum Management and Curatorship, 22* (2), 183-199.

Lindauer, M. A. (2005). From salad bars to vivid stories: four game plans for developing 'educationally successful' exhibitions. *Museum Management and Curatorship, 20,* 41–55.

Lund, N. D. (2009). Digitalisering som kulturpolitik: Agendaer og aktører i den nye formidling af fortiden. In N. D. Lund, J. Andersen, H. D. Christensen, L. Skouvig, & C. G. Johannsen (Eds.), *Digital formidling og kulturarv – fra samling til sampling* (pp. 15-40). Copenhagen: Multivers.

Lynch, B. (2011). Collaboration, contestation, and creative conflict: On the efficacy of museum/community partnerships. In J. Marstine (Ed.), *Redefining museum ethics* (pp. 146-163). London: Routledge.

Löwgreen, J., & Stolterman, E. (2007). *Thoughtful Interaction Design.* Massachusett: MIT Press.

Løssing, A. S. (2008). *Danske kunstmuseer på nettet: En kortlægning og diskussion af en kunstmuseal formidlings- og udstillingspraksis.* (Unpublished PhD thesis). Aarhus University, Aarhus.

Løssing, A. S. (2014). *Fælles digital strategi? En foranalyse.* Retrieved from http://mmex.dk/blog/f%C3%A6lles-digital-strategi-en-foranalyse.

Macalik, J., Fraser, J., & McKinley, K. (Eds.). (2015). Special Issue: Discursive Space Museums, Communities, and Society Users as Collaborators. *Curator: The Museum Journal, 58* (1).

Macdonald, S. (2001). Ethnography in the Science Museum, London. In D. N. Gellner, & E. Hirsch (Eds.), *Inside Organizations: Anthropologists at Work* (pp. 77-96). Oxford: Berg.

Macdonald, S. (2002). *Behind the Scenes at the Science Museum.* Oxford: Berg.

Macdonald, S. (2006). Expanding Museum Studies: An Introduction. In S. Macdonald (Ed.), *A Companion to Museum Studies* (pp. 1-12). Malden: Blackwell Publishing.

MacKenzie, D., & Wajcman, J. (1985). Introductory Essay. In D. MacKenzie, & J. Wajcman (Eds.), *The Social Shaping of Technology: How the refrigerator got its hum.* Philadelphia: Open University Press.

Marcus, G. (1998). *Ethnography through thick and thin.* Princeton: Princeton University Press.

Markus, M. L., & Robey, D. (1988). Information Technology and Organizational Change: Causal Structure in Theory and Research. *Management Science, 34* (5), 583-598.

Marty, P., & Parry, R. (2008). Introduction to Digital Heritage. *Museum Management and Curatorship, 23* (4), 307-308.

Mathar, T. (2008). Making a Mess with Situational Analysis? *Forum: Qualitative Social Research, 9* (2).

Mattessich, P. W., & Monsey, B. R. (1992). *Collaboration: What Makes It Work.* St. Paul: Amherst H. Wilder Foundation.

McDonnell, J. (2012). Accommodating disagreement: A study of effective design collaboration. *Design Studies, 33*, 44-63.

McDonnell, J., & Lloyd, P. (2009). Introduction. In J. McDonnell, & P. Lloyd (Eds.), *About: Designing. Analysing Design Meetings* (pp. 1-29). London: CRC Press.

Mead, G. H. (1962). *Mind, Self, and Society from the Standpoint of a Social Behaviorist.* (C. W. Morris, Ed.) Chicago: The University of Chicago Press.

Meli, D. B. (1990). The Relativization of Centrifugal Force. *Isis, 81* (1).

Meyer, A. D. (1991). Visual data in organizational research. *Organization Science, 2*, 218-236.

Miles, M. B., & Huberman, M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook.* Thousand Oaks: Sage.

Mintzberg, H., Raisinghani, D., & Théorêt, A. (1976). The structure of unstructured decision processes. *Administrative Science Quarterly, 21*, 246-275.

Mohr, L. B. (1982). *Explaining organizational behavior.* San Francisco: Jossey-Bass.

Morse, J., Stern, P., Corbin, J., Bowers, B., Charmaz, K., & Clarke, A. (2009). *Developing Grounded Theory: The Second Generation.* Walnut Creek: Left Coast Press.

Moussouri, T. (2012). Knowledge management for collaborative exhibition development. *Museum Management and Curatorship, 27* (3), 253-272.

Nadai, E., & Maeder, C. (2005). Fuzzy Fields. MultiSited Ethnography in Sociological Research. *Forum: Qualitative Social Research, 6* (3).

Nicolini, D. (2012). *Practice Theory, Work, & Organization: An Introduction.* Oxford: Oxford University.

Nielsen, G. (2000). Looking Back on the Subject: Mead and Bakhtin on Reflexivity and the Political. In C. Brandist, & T. Galin (Eds.), *Materializing Bakhtin: The Bakhtin Circle and Social Theory* (pp. 142-163). London: Palgrave Macmillan.

Nielsen, G. (2002). *The Norms of Answerability: Social Theory Between Bakhtin and Habermas.* Albany: State University Press.

Nutt, P. C. (1984). Types of organizational decision processes. *Administrative Science Quarterly, 29*, 414-450.

Olesen, F., & Kroustrup, J. (2007). ANT – Beskrivelsen af heterogene aktør-netværk. In C. B. Jensen, P. Lauritsen, & F. Olesen (Eds.), *Introduktion til STS* (pp. 63-91). Copenhagen: Hans Reitzels Forlag.

Olson, G. M., Olson, J. S., Carter, M. R., & Storrøsten, M. (1992). Small Group Design Meetings: An Analysis of Collaboration. *Human-Computer Interaction, 7*, 347-374.

Orlikowski, W. J. (2007). Sociomaterial Practices: Exploring Technology at Work. *Organization Studies, 28* (9), 1435–1448.

Orlikowski, W. J., & Barley, S. R. (2001). Technology and Institutions: What Can Research on Information Technology and Research on Organizations Learn from Each Other? *MIS Quarterly, 25* (2), 145-165.

Orlikowski, W. J., & Baroudi, J. J. (1990). Studying Information Technology in Organizations: Research Approaches and Assumptions. In *Working Paper Series.* Stern School of Business, New York University. Retrived from: https://archive.nyu.edu/bitstream/2451/14404/1/IS-90-04.pdf.

Orlikowski, W. J., & Iacono, C. S. (2001). Research Commentary: Desperately Seeking the 'IT' in IT Research: A Call to Theorizing the IT Artifact. *Information Systems Research, 12* (2), 121-134.

Orlikowski, W. J., & Scott, S. V. (2008). Sociomateriality: Challenging the Separation of Technology, Work and Organization. *The Academy of Management Annals, 2* (1), 433–474.

Outhwaite, W., & Turner, S. P. (Eds.). (2007). *Handbook of Social Science Methodology.* Thousand Oaks: Sage.

Parry, R. (2005). Digital heritage and the rise of theory in museum computing. *Museum Management and Curatorship, 20*, 333–348.

Parry, R. (2007). *Recoding the Museum: Digital Heritage and the Technologies of Change.* London: Routledge.

Parry, R. (2010). The Practice of Digital Heritage and the Heritage of Digital Practice. In R. Parry (Ed.), *Museums in a Digital Age* (pp. 1-7). London: Routledge.

Parry, R. (2013). The End of the Beginning: Normativity in the Postdigital Museum. *Museum Worlds: Advances in Research, 1*, 24-39.

Parry, R., & Sawyer, A. (2005). Space and the machine: Adaptive museums, pervasive technology and the new gallery environment. In S. MacLeod (Ed.), *Reshaping Museum Space: Architecture, Design, Exhibitions* (pp. 39-52). London: Routledge.

Patton, M. Q. (1990). *Qualitative evaluation and research methods.* Beverly Hills: Sage.

Peacock, D. (2008). Making Ways for Change: Museums, Disruptive Technologies and Organisational Change. *Museum Management and Curatorship, 23* (4), 333-351.

Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organization Science, 1*, 267-292.

Pettigrew, A. M. (1997). What is a Processual Analysis? *Scandinavian Journal of Management, 13* (4), 337-348.

Phillips, L. (2011). *The Promise of Dialogue: The Dialogic Turn in the Production and Communication of Knowledge.* Amsterdam: John Benjamins Publishing Company.

Phillips, L., Kristiansen, M., Vehviläinen, M., & Gunnarsson, E. (Eds.). (2013). *Knowledge and Power in Collaborative Research: A Reflexive Approach.* New York: Routledge.

Pinch, T. J., & Bijker, W. B. (1987). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In W. E. Bijker, T. P. Hughes, & T. J. Pinch (Eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge: The MIT Press.

Poggenpohl, S. H. (2009). Time for Change: Building a Design Discipline. In S. H. Poggenpohl, & K. Sato (Eds.), *Design Integrations: Research and Collaboration* (pp. 3-22). Chicago: The University of Chicago Press.

Polanyi, M. (1967). Sense-giving and sense-reading. *The Journal of The Royal Institute of Philosophy, XLII* (162), 301–325.

Pujol-Tost, L. (2011). Integrating ICT in exhibitions. *Museum Management and Curatorship, 26* (1), 63-79.

Quinn, R. E., & Rohrbaugh, J. (1981). A Competing Values Approach to Organizational Effectiveness. *Public Productivity Review, 5* (2), 122-140.

Rambøll Management. (2005). *It's rolle i oplevelsesøkonomien.* Retrieved from: http://www.kulturplan-oresund.dk/pdf/ItsRolleIOplevelsesokonomien.pdf.

Roberts, T. (2014). Interpretation design: an integrative, interdisciplinary practice. *Museum & Society, 12* (3), 191-209.

Robinson, H. (2014). Knowledge utopias: An epistemological perspective on the convergence of museums, libraries and archives. *Museum & Society, 12* (3), 210-224.

Rudloff, M. (2013). *Formidling i forandring: Et casestudie af væggen – et dansk eksempel på digital, interaktiv museumsformidling i overgangen fra genstandsrepræsentation*

til brugergenereret kultur. (Unpublished PhD thesis). University of Southern Denmark, Odense.

Russo, A. (2011). Transformations in Cultural Communication: Social Media, Cultural Exchange, and Creative Connections. *Curator: The Museum Journal, 54* (3).

Russo, A. (2012). The rise of the 'media museum': creating interactive cultural experiences through social media. In E. Giaccardi (Ed.), *Heritage and Social Media. Understanding Heritage in a Participatory Culture* (pp. 145–157). New York: Routledge.

Rørbæk, A. (2013a). *Getting From A to B to C-ollaborative Innovative Design Utopia at the Museum?* Conference paper presented at Fifth International Symposium on Process Organization Studies, Crete, Greece.

Rørbæk, A. (2013b). Too many cooks spoil the broth? *International Conference on Design and Digital Heritage, Stockholm, Sweden 2013, Proceedings* (pp. 201-206). Stockholm: Interactive Institute Swedish ICT.

Sandelowski, M. (1994). The proof is in the pottery: Toward a poetic for qualitative enquiry. In J. M. Morse (Ed.), *Critical issues in qualitative research methods* (pp. 44-63). Thousand Oaks: Sage.

Sanders, E. B., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign: International Journal of CoCreation in Design and the Arts, 4* (1), 5-18.

Sarasan, L. (1981). Why computer projects fail. *Museum News, 59* (4), 40-49.

Schatzki, T. R., Cetina, K. K., & Savigny, E. V. (Eds.). (2001). *The Practice Turn in Contemporary Theory.* London: Routledge.

Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action.* New York: Basic Books.

Schneider, A. (1998). *Creating the Musée d'Orsay. The Politics of Culture in France.* Pennsylvania: Pennsylvania State University Press.

Schweibenz, W. (2004). Virtual Museums. The Development of Virtual Museums. *ICOM News, 3* (3).

Sefland, S. (2014, December 9). Hvis Heidegger var museumsdirektør. *Information.* Retrieved from http://www.information.dk.

Signell, P. (2002). Acceleration and force in circular motion. In *Physnet.* Retrieved from http://www.physnet.org/modules/pdf_modules/m17.pdf.

Silverman, D. (2010). *Doing Qualitative Research* (3rd ed.). London: Sage.

Simon, H. A. (1996). *The Sciences of the Artificial.* Cambridge: The MIT Press.

Simon, N. (2010). *The Participatory Museum.* Santa Cruz: Museum 2.0.

Simonsen, J., Bærenholdt, J. O., Büscher, M., & Scheuer, J. D. (Eds.). (2010). *Design Research: Synergies from Interdisciplinary Perspectives.* Oxon: Routledge.

Sismondo, S. (2009). *An Introduction to Science and Technology Studies.* West Sussex: Wiley-Blackwell.

Skot-Hansen, D. (2008). *Museerne i den danske oplevelsesøkonomi − når oplysning bliver en oplevelse.* Frederiksberg: Imagine.

Skot-Hansen, D. (2009). Digital formidling i danske museer. Udfordringer for oplevelsessamfund og oplevelsesøkonomi. In N. D. Lund, J. Andersen, H. D. Christensen, L. Skouvig, & C. G. Johannsen (Eds.), *Digital formidling af kulturarv. Fra samling til sampling* (pp. 43-63). Copenhagen: Forlaget Multivers.

Smørdal, O., Stuedahl, D., & Sem, I. (2014). Experimental zones: two cases of exploring frames of participation in a dialogic museum. *Digital Creativity, 25* (3), 224-232.

Šola, T. (2010). Making the Total Museum Possible. In R. Parry (Ed.), *Museums in a Digital Age* (pp. 421-426). London: Routledge.

Sonnenwald, D. H. (1995). Contested Collaboration: A Descriptive Model of Intergroup Communication in Information System Design. *Information Processing & Management, 31* (6), 859-877.

Sonnenwald, D. H. (1996). Communication roles that support collaboration during the design process. *Design Studies, 17*, 277-301.

Springuel, M. (2001). Management and Change: Who is Invited and Who Participates? *Curator, 44* (1), 129-135.

Star, S. L. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science, Technology, & Human Values, 35* (5), 601-617.

Star, S. L., & Griesemer, J. R. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science, 19* (3), 387-420.

Stolterman, E. (2008). The Nature of Design Practice and Implications for Interaction Design Research. *International Journal of Design, 2* (1), 55-65.

Strauss, A. L. (1959). *Mirrors and masks: The search for identity.* Glencoe: The Free Press.

Strauss, A. L. (1978a). A Social World Perspective. *Studies in Symbolic Interaction, 1*, 119-128.

Strauss, A. L. (1978b). *Negotiations: Varieties, Processes, Contexts, and Social Order.* San Francisco: Jossey-Bass.

Strauss, A. L. (1988). The Articulation of Project Work: An Organizational Process. *The Sociological Quarterly, 29* (2), 163-178.

Strauss, A. L. (2010). *Continual Permutations of Action* (3rd ed.). Piscataway: Transaction Publishers.

Strauss, A. L., & Corbin, J. (1990). *The Basics of Qualitative Analysis: Grounded Theory Procedures and Techniques.* Newbury Park: Sage.

Stuedahl, D. (2004). *Forhandlinger og overtalelser: Kunnskapsbygging på tvers av kunnskapstradisjoner i brukermedvirkende design av ny IKT.* (Unpublished PhD thesis). University of Oslo, Oslo.

Stuedahl, D. (2011). Social Media and Community Involvement in Museums. *Nordisk Museologi, 1*, 3-14.

Stuedahl, D. (Ed.). (2014). Special Issue: Designing for creative engagement in museums and cultural institutions. *Digital Creativity, 25* (3).

Svabo, C. (2010). *Portable Objects at the Museum.* (Unpublished PhD thesis). Roskilde University, Roskilde.

Søndergaard, M., & Veirum, N. (2012). Museums and culture-driven innovation in public private consortia. *Museum Management and Curatorship, 27* (4), 341-356.

Tallon, L. (2008). Introduction: Mobile, Digital, and Personal. In L. Tallon, & K. Walker (Eds.), *Digital Technologies and the Museum Experience: Handheld Guides and Other Media.* Lanham: AltaMira Press.

Tallon, L., & Walker, K. (Eds.). (2008). *Digital technologies and the museum experience: handheld guides and other media.* Lanham: AltaMira Press.

Tanackovic, S., & Badurinam, B. (2009). Collaboration of Croatian cultural heritage institutions: Experiences from museums. *Museum Management and Curatorship, 24* (4), 299-321.

Thomas, S. (1998). Introduction. In S. Thomas, & A. Mintz (Eds.), *The Virtual and the Real: Media in the Museum* (pp. viii-xi). Washington: Association of American Museums.

Thomas, S., & Mintz, A. (Eds.). (1998). *The Virtual and the Real. Media in the Museum.* Washington: American Association of Museums.

Tufte, E. R. (2001). *The Visual Display of Quantitative Information* (2nd ed.). Connecticut: Graphics Press.

Turnbull, D. (2000). *Masons, Trixters, and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge.* Amsterdam: Harwood Academic.

Van de Ven, A. H., & Poole, M. S. (1990). Methods for Studying Innovation Development in the Minnesota Innovation Research Program. *Organization Science, 1* (3), 313-335.

Van Maanen, J. (2001). Afterword: Natives 'R' Us: Some Notes on the Ethnography of Organizations. In D. N. Gellner, & E. Hirsch (Eds.), *Inside Organizations: Anthropologists at Work* (pp. 231-261). Oxford: Berg.

Vergo, P. (Ed.). (1989). *The New Museology.* London: Reaktion books.

Vinderskov, K. (2010). Målgruppe og segment. In S. Kolstrup, G. Agger, P. Jauert, & K. Schrøder (Eds.), *Medie- og kommunikationsleksikon* (pp. 359-361). Frederiksberg: Samfundslitteratur.

Waibel, G., & Erway, R. (2009). Think globally, act locally: library, archive, and museum collaboration. *Museum Management and Curatorship, 24* (4), 323-335.

Walz, D. B. (1988). *A longitudinal study of the group design process.* (Unpublished PhD thesis). The University of Texas, Austin.

Washburn, R. (2013). Rethinking the disclosure debates: A situational analysis of the multiple meanings of human biomonitoring data. *Critical Public Health, 23* (1), 1-14.

Waterton, E. (2010). The advent of digital technologies and the idea of community. *Museum Management and Curatorship, 25* (1), 5-11.

Webster, J., & Watson, R. T. (2002). Analysing the past to prepare for the future: Writing a literature review. *MIS Quarterly, 26* (2), xiii-xxiii.

Wenger, E. (1998). *Communities of Practice.* New York: Cambridge University Press.

Winner, L. (1977). *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought.* Cambridge: The MIT Press.

Wolcott, H. F. (1994). *Transforming Qualitative Data: Description, Analysis, and Interpretation.* Thousand Oaks: Sage.

Woodward, M. (2009). *Overlapping Dialogues: The Role of Interpretation Design in Communicating Australia's Natural and Cultural Heritage.* (Unpublished PhD thesis). Curtin University, Bentley.

Woolgar, S. (1991). Configuring the User: the case of usability trials. In J. Law, *A Sociology of Monsters. Essays on Power, Domination and Technology* (pp. 57-99). London: Routledge.

Yaneva, A. (2003). When a bus met a museum: following artists, curators and workers in art installation. *Museum and Society, 1* (3), 116-131.

LIST OF APPENDICES

Appendix 1:   List of participants
Appendix 2:   Simple data overview
Appendix 3:   Maps

Appendix 1 and 2 are inserted on the following pages. Appendix 3 is accessible on the enclosed disc (due to anonymisation issues, Appendix 3 is only accessible to the assessment committee).

APPENDIX 1: LIST OF PARTICIPANTS

Below is a list of the people participating in the meetings in the Art Case and the Cultural Heritage Case. The participants are listed according to their departmental or professional affiliation, and their work title is displayed. After the work title, it is specified in which projects they participate. Also, the people interviewed in the supplementary cases are listed.

THE ART CASE

Education / museum

Emma	Head of education/project manager (Sun, Moon, Stars)
Emil	Educator (Sun, Moon, Stars)
Maya	Project manager assistant / student worker (Moon, Stars)
Jennifer	Educator (Moon)
Lucy	Educator (Moon)
Harry	Educator (Stars)

Curation / museum

Sarah	Curator (Sun, Moon)
Maria	Curator (Moon, Stars)
Mark	Curator (Moon)
Sandra	Exhibition assistant (Moon, Stars)
Lisa	Exhibition assistant (Stars)

Communication / museum

Mia	Marketing and online manager (Sun, Moon, Stars)
Amanda	Graphic designer (Moon)

Guard / museum

Helen	Guard (Stars)

Reception / museum

Karen	Receptionist (Stars)

Digital design company

Julia	Broker / project manager (Sun, Moon, Stars)

Benjamin	Creative director / project manager (Sun, Moon, Stars)
Henry	CEO (Sun)
Susan	Interaction designer (Sun)
Christine	Intern (Stars)

THE CULTURAL HERITAGE CASE

Project management

Alex	Project manager (Dawn, Dusk)
Louisa	Facilitator (Dawn)
Hannah	Project manager assistant (Dusk)
Grace	Student worker (Dusk)

Archeology / existing museum

Olivia	Archeologist / museum director (Dawn, Dusk)
Brad	PhD student (Dusk)

Education / existing museum

Alice	Educator (Dawn, Dusk)
Jimmy	Educator (Dawn, Dusk)

Archeology / partnering museum

Michelle	Archeologist (Dusk)

Exhibition making / partnering museum

Florence	Exhibition architect (Dusk)
Jane	Graphic designer / project manager (Dusk)
Noah	Director of communication department (Dusk)

Digital design companies

Tobias	Interaction designer (Dawn)
Arthur	CEO (Dawn)
Zach	Digital installation designer/artist (Dusk)
Milo	Digital installation designer/artist (Dusk)
Anya	Digital installation designer/artist (Dusk)

Other creative professions

Emilie	Dancer/choreographer (Dawn)
Freddie	Visual effects supervisor (Dawn)
Jonas	Online media entrepreneur / artist (Dawn)
Albert	Production manager (Dawn)
Isabella	Production designer (Dawn)

Hugo   Architect (Dawn)
Betty   Architect (Dawn)
Sienna   Architect (Dawn)

Others

Tom   Soldier (Dawn, Dusk)
Frank   Researcher / archeologist (Dawn)
Finn   Historian (Dawn)
Isaac   Project manager at another museum (Dawn)
Oliver   Museum director at another museum (Dawn)

THE SUPPLEMENTARY CASES

Rebecca   Curator at a newly built museum
Matt   Production manager at a newly built museum
Luke   Exhibition designer at a newly built museum
Camilla   Employee in an organisation supporting museums in developing digital
              museum communication

APPENDIX 2: SIMPLE DATA OVERVIEW

The following list gives a simple overview of the data from the primary and supplementary cases by displaying major events occurring, structured in a chronological manner. The date is noted as month/day/year, e.g. 030512.

THE ART CASE

The Sun Project

Date	Type of event
030512	Meeting
032112	Meeting
032812a	Informal conversation with Emma
032812b	User workshop
040312	Skype meeting
041712	Meeting
052112	Interview with Julia and Benjamin
052412	Interview with Emma
053112	Informal conversation with Julia and Benjamin
062712	User workshop (evaluation of the Sun App)

The Moon Project

Date	Type of event
050212	Meeting
051512	User workshop
052212	Skype meeting
053012	Meeting
060112a	Meeting (only museum staff)
060112b	Telephone meeting between Julia and Emma

060412a	Meeting (only museum staff)
060412b	Telephone meeting between Julia and Emma
060712	Skype meeting
061312	Skype meeting
062012	Telephone meeting between Julia and Emma
081512	Interview with Emma
082012	Museum staff workshop (evaluation of the Moon App)
082112	Informal conversation with Jennifer
090312	Interview with Julia and Benjamin

The Stars Project

Date	*Type of event*
091912	Museum staff workshop
092412	Informal conversation with Benjamin
100312a	Meeting
100312b	User workshop
112212	Meeting
120312	Informal conversation with Emma
010313	Meeting
030713	Informal conversation with Emma
031313	Informal conversation with Emma, Benjamin and Julia
040413	Interview with Emma
040813	Interview with Julia and Benjamin
050713	User workshop
091613	Interview with Emma (concluding)
091913	Informal conversation with Emma

THE CULTURAL HERITAGE CASE

The Dawn Project

Date	Type of event
032212	Informal conversation with Alex
041812	Informal conversation with Alex
042512	Informal conversation with Alex
050712	Informal conversation with Alex
060712	Informal conversation with Alex
062512a	Meeting
062512b	Informal conversation with Isabella, Tobias and Arthur
062912	Informal conversation with Alex
080812	Informal conversation with Alex
082012a	Meeting
082012b	Informal conversation with Tobias and Emilie
082912	Informal conversation with Alex
090412a	Meeting between Alex and Louisa
090412b	User workshop
091012	Meeting
091012	Informal conversation with Tobias
092112	Interview with Alex
092812	Interview with Tobias
100812	Interview with Olivia
102412	Informal conversation with Alex
110112	Informal conversation with Alex
110912	Interview with Louisa
031513	Informal conversation with Alex

The Dusk Project

Date	*Type of event*
040413	Informal conversation with Alex
050613	Informal conversation with Alex
052213	Meeting
061413	Informal conversation with Alex
061713	Meeting
062813	Meeting
082213	Meeting
090513	Meeting
091913	Meeting with external designers (Alex, Hannah, Zach, Milo and Anya)
092613	Meeting
100413	Meeting
111213	Interview with Alex (concluding)

SUPPLEMENTARY CASES

Date	*Type of event*
111413	Interview with Matt and Luke
120913a	Interview with Camilla
120913b	Interview with Rebecca