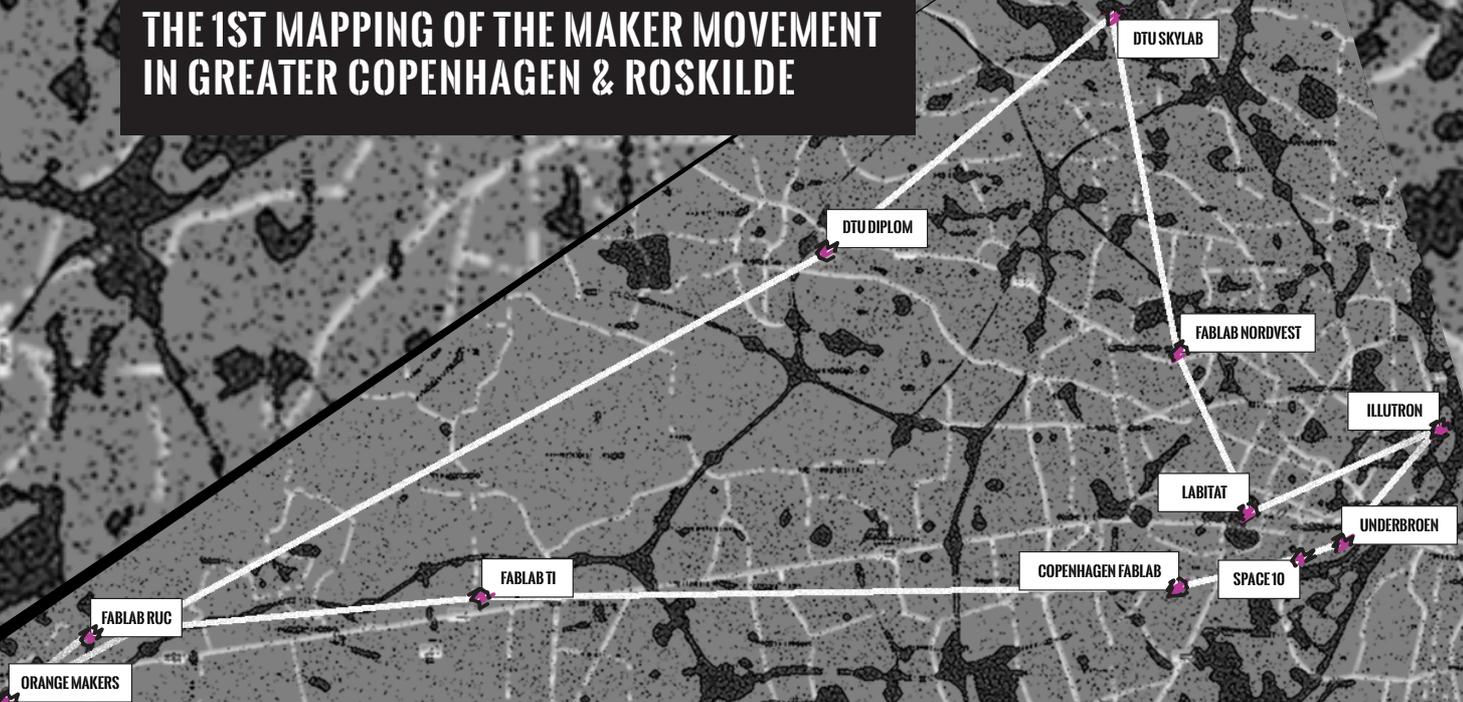


# IN THE NETWORK

THE 1ST MAPPING OF THE MAKER MOVEMENT  
IN GREATER COPENHAGEN & ROSKILDE



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## **ABSTRACT**

This thesis is the first mapping of the Maker Movement in Greater Copenhagen and Roskilde. It is an interdisciplinary qualitative study that is set out to explore and map the characteristics of the Maker Movement in Greater Copenhagen and Roskilde.

The thesis answers the following questions:

First, how the historical development has an impact on the making, coordination, communication and knowledge sharing of the initiatives in the Maker Movement in the Greater Copenhagen and Roskilde (i.e., the Hackerspace 'Labitat', Makerspace 'Orange Makers' and 'Fablab Nordvest').

Second, how the Hackerspace 'Labitat', Makerspace 'Orange Makers' and 'Fablab Nordvest' are utilizing different kinds of pedagogics (i.e., via the machine training, the Maker Mindset through Hacker ethics or informal apprenticeship) to integrate newcomers.

Third, how the 'Maker Mindset', the 'Growth mindset' and the 'Effort-driven reward circuit' is enacted in 'Orange Makers' and 'Fablab Nordvest' practices with people of marginalized groups via informal apprenticeship.

Fourth, how a collective of four managers in collaboration across initiatives in the Maker Movement in Greater Copenhagen and Roskilde has arranged and coordinated an internal gathering.

Fifth, how a knowledge-sharing bus trip can enable the managers to understand each other's approaches and to build common ground towards making an intranet and a trade association.

## **ABBREVIATIONS**

This thesis revolves around the 'Maker Movement in the Greater Copenhagen and Roskilde', which takes up several characters, therefore I use the abbreviation MMGC&R.

When I refer to the 'Knowledge sharing bus trip', I use KSBT.

I have placed 'Definitions of concepts' in Appendix 1, and even though I refer to them during the thesis, I recommend that you read them (e.g., hacker) beforehand.

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## 1. INTRODUCTION

The Maker Movement is a global phenomenon that is currently on the rise. The Maker Movement includes various kinds of Makers who are making tangible things, such as hobbyists, tinkerers, engineers, Hackers, and artists (Martin, 2015, p. 30). The term *Maker* can be traced back to around 300 BCE (Dougherty, 2016, p. 1). It involves the violent act of cutting and killing the wood which gives us satisfaction and self-assurance as it is our bodily strength that is used in the process (Arendt, 1998, p. 139, 140) (See definition of concepts). The Maker Movement has moved from the original Do-It-Yourself (DIY) wave through the industrial DIY tools to the new Do-IT-Together wave which includes the online digital production technologies, such as 3D-printing, featured by interactional mobility and capability (Eaves & Harwood, 2018, pp. 92, 93). The Maker Movement can be traced back to the Hacker Movement that grew out of Hacker clubs, which was, shared machines shop that can be traced back to the gentlemen's clubs in the 18 century and the men's working clubs in the 19 century (maxigas, 2014, p. 3). The Hacker movement gave rise to the USA O'Reilly media 'Make magazine' in 2005, and the Maker Faire in 2006 and at Menlo Park, California, the USA in 2006 'Techshop' started which according to Hatch (2014), the CEO of 'Techshop' was "... a member-based, Do-It-Yourself (DIY), open access, fabrication workspace" (p. 3) (Martin, 2015, p. 30) (maxigas, 2012, p. 5). Hatch (2014) wrote that: "*Techshop was the first open-access workshop of its kind. With six locations open across the United States at the time of writing and many more in the works and aspirations to go international, Techshop is now the largest and most influential Makerspace in the world*" (p. 4). 'Techshop' was a commercial Makerspace that was based on a fitness-gym membership (Anderson, 2013, p. 18). Through the membership, 'Techshop' provided access to easy-to-use tools, knowledge, capital, and market that facilitated the Maker Movement (Anderson, 2013 p. 18). To date, there are nearly a thousand Makerspaces in the world often started in local communities (Anderson, 2013, p. 18). For instance, Anderson (2013) wrote about how "*Shanghai alone is building one hundred of them*" (p. 18). Nevertheless, 'Techshop' filed for bankruptcy in 2017 (Su, 2017). When

writing this thesis 'Make magazine' and 'Maker Faire' has shut down but they are still using the 'Maker fair licensing program' as Dougherty said in an email in an article in Cnet 8 June 2019 "*I hope to get control of the assets in a new organization, which might be a nonprofit*" (Moyer, 2019). Currently, there is Maker Faires and mini Maker Faires in Australia, North America, South America, Asia, and Europe. In Denmark, there is a mini Maker Faire located in Aarhus (Aarhus Makerfaire, 2019; Maker Faire, 2019) (Appendix 2: MakerfairMap). However, what if I said that the characteristics of the initiatives in the MMGC&R stem from the Hacker movement, the 'Roskilde festival's' innovation unit 'Orange innovation' and 'Fablab Danmark'; the first Fablab in Denmark and that they make a gathering named 'Copenhagen Maker festival' once a year? (Copenhagen Maker, 2019). This thesis is the first mapping of the MMGC&R (Appendix 3: Searches). In this thesis, I examine this through a qualitative investigation with managers from the Hackerspace 'Labitat', the Makerspace 'Orange Makers' and 'Fablab Nordvest'. Also, I map the characteristics of how the initiatives stem from the Hacker movement, the 'Roskilde festival's' innovation unit 'Orange innovation', and 'Fablab Danmark'. Since the MMGC&R first meeting at the 'Made' festival in 2014, the initiatives have spent their time on establishing themselves by creating associations and *business models* based on the various funding they have received from the public sector in Denmark (Appendix 18: Martin Tilsted // Teknik- og Miljøforvaltningen i Københavns kommune).

However, there have not been any internal events for the MMGC&R since 2014. Several of the initiatives have not seen each other's initiatives. Through interviews and observations, I have gained knowledge about the different initiatives in the MMGC&R and how they *other* each other (Brons, 2015).

*Othering* is dangerous to the survival of communities of practices, as othering can fixate the boundary of the communities, and stop members of communities of practices from learning. This is also why knowledge sharing across borders was crucial (Wenger, 2000, p. 230).

The public's interest in the MMGC&R has increased over the years. For instance, in 2016, the 'Copenhagen Maker Festival' had 2,500 festivalgoers and

Makers. In 2017 the number increased to 5,000. In 2018 it dropped to 4,000, but that has to do with the fact that the Copenhagen Maker Festival in 2018 shortened their program from 3 days to 2 days (Appendix 4: CMF participants). In this thesis, I will follow the organizing and coordinating a KSBT and observe what happens when Makers and Hackers travel in a bus between eleven initiatives in the Greater Copenhagen and Roskilde and how knowledge sharing in management leads to the need of internal network technology. This thesis centers on Digital Innovation and Management. It is an interdisciplinary study placed in the middle of 3 bodies of literature including, pedagogics, social science and technology studies (STS) and communication and management. From a pedagogical perspective, I use Etienne Wenger's book '*Praksis fællesskaber*' to describe how the initiatives in the MMGC&R communicate via a shared repertoire around artifacts (e.g., machines) and documents and create a sense of shared responsibility during the coordination (Wenger, 2004). Etienne Wenger and Jan Laves inform me in *Situated learning*, when describing the apprenticeship and how newcomers enter the initiatives (Lave & Wenger, 2003). From an STS perspective, I further combine Leigh Star's *boundary objects* and Anselm Strauss' *Authenticity with communities of practices*. Also, I use Donna Haraway's *Situated knowledge* to describe my position in the MMGC&R and how we (the organizers of KSBT including me) have been a collective that has organized a KSBT between eleven initiatives in the MMGC&R (Haraway, 1988). Furthermore, I use Ann Marie Mol's *Enactment* to describe practices and how needs are enacted articulated and manipulated (Mol, 2002). In addition, *othering* is used to describe the differences between their self-perceived identities and their identities in relation to the other initiatives (Brons, 2015). From the perspective of communication and management, I use Wenger's article *Communities of practices* to investigate the work practices of how the initiatives communicate and organize differently depending on where they come from (Wenger, 2000). In particular, I have examined strategies of using *Hacker ethics*, *Do-ocracy*, and *Co-creation* in the MMGC&R (Appendix 1: Definition of concepts). When writing this thesis I have taken

inspiration from the course 'Navigating complexities' by using Donna Haraway's *situated knowledge* and part of Adele Clarke's Social world arenas is Leigh Star's *boundary objects* and Anselm Strauss' *Authenticity* that have been used as a framework in the DIM course, wherefrom I knew that both existed. Throughout this thesis, the need for an intranet has arisen, and here I have taken inspiration from 'Foundations in Development of IT,' 'Digital Business Models' and 'Process innovation.' Also, 'Change Management' was used when investigating the roles of the managers and the alignment in the coordinating work. Briefly, 'Digital Management, Governance, and Accountability' was used when describing a new governance networked initiative at 'Fablab Nordvest', Smedtoften. Informed by these perspectives, the research question of this thesis is written below:

*What are the characteristics of the Maker Movement in Greater Copenhagen and Roskilde, and how might their means of communication create a shared repertoire and shared responsibility?*

To answer the research question, I have developed the following three sub-questions:

- ❖ *What is the historical development of the Maker Movement in Copenhagen and Roskilde?*
- ❖ *How is knowledge shared within the community?*
- ❖ *Which means of communication is practiced?*

In the next section, I will introduce how I am *situated* in the MMGC&R and which qualitative methods I have used.

## 2. METHOD

### 2.1 HOW I AM PART OF THE MMGC&R

From September 2018 to April 2019, I have been part of coordinating a KSBT that traveled between 11 initiatives in the MMGC&R. The trip is part of this thesis and constitutes the central empirical case for my discussion of communication and coordination in the practices within the community. Thereby, can I not take a distanced objective position as a ‘God eye’s trick,’ as I am *situated* with my embodied knowledge (Haraway, 1988, pp. 581, 582, 593). Thus, you should know how I am *situated* in the MMGC&R and my position so you know whose eyes active perceptual system that is looking (Haraway, 1988, p. 583). I am *situated* in the MMGC&R in the role as a broker; that kind of broker Wenger (2000) calls a *Roamer* because I like to stay at the borders of as many of the initiatives as I have time to (Wenger, 2000, p. 235). My first encounter with the MMGC&R was in December 2012 when I got my certificate to a laser cutter at ‘Republikken’ located at *Vesterbrograde 26* in Copenhagen. I had fallen completely in love with the laser cutter, so I went to ‘Copenhagen Fablab’ located at Valby Kulturhus immediately when it opened in January 2013 to explore the laser cutter’s potentials (Kultur Valby, 2013). I could use apprenticeship and *learning by doing* that I had carried with me from my primary education as a ‘*Mediegrafiker*’: I had worked with Adobe programs on Mac and PC at an expert level and had the tacit knowledge of the efficient work procedure and keyboard shortcuts as I had worked on newspapers. During my *professions-bachelor*, I worked with managers in ‘Fablab TI’ as an inventor’s counselor student helper at the ‘Danish Technological Institute’ (DTI), as a creative boss with the managers from ‘Fablab Nordvest’ in creating the sustainable speaker ‘Campblaster’ and later as a student helper at ‘Fablab Nordvest’. I have thought kids and youngsters how to code via ‘Praktisk.co’ and ‘Creating Maker Mindsets’ in elementary schools. Also, I am part of the coordinating team that makes the ‘Copenhagen Maker festival’. With my skillset at communication, project management, and

strategy, I can swap between the initiatives in the MMGC&R. The role gives me access to the MMGC&R *shared repertoire*, which often would be difficult to gain access to for an outsider. I am well aware that I am part of the *periphery participation* and not the *core memberships* in the initiatives since 'Communities of practices' (CoPs) is defined by a *shared engagement* (Wenger, 2004, p. 140). Thereby, I carry knowledge about how the different initiatives operate and thus I can break myths and create alignment between them by for instance telling them what the others are doing (Wenger, 2004, p. 140). However, it should not only be through my enactment that the initiatives know things about each other which were the reason why I among others got the idea of creating a knowledge sharing between the initiatives in the MMGC&R (Mol, 2002, p. 5). I got the idea in 2016 after I had worked in Fablab IT and later worked at 'Fablab Nordvest'. In the next section, I will describe the methods I have used during fieldwork.

## **2.2 INTERVIEWS**

### **UNSTRUCTURED INTERVIEW**

What characterizes the unstructured interview is that it does not reflect any preconceived theories or ideas and are performed with little or no organization (Gill et al., 2008, p. 291). It can start with one question and then proceed as a conversation from there (Gill et al., 2008, p. 291). As I am part of a collective that is planning the knowledge-sharing bus trip I have recorded the meetings. These unstructured interviews are often conversations that I had with people during these meetings.

### **SEMI-STRUCTURED INTERVIEWS**

When conducting interviews as a *Roamer*, it is essential to keep the interview on track as the close relations between the interviewees and me open up many other themes to cover (Kvale and Brinkmann, 2015, p.185). Thus, before conducting the interviews, I have created a semi-structured interview guide with an overview of themes that will be conversed during the interview (Kvale and Brinkmann, 2015, p. 185). While this overview of themes has

enabled me to keep the interview on track, it also allows me to ask other related questions that arose during the interview.

## **TRANSCRIPTIONS**

Transcription is a process of abstraction where the tone of voice, intonations, and breath are left out (Kvale and Brinkmann, 2015, p. 236). The interviews are transcribed in a 'normal' and literally language in full length where unfinished words or words like *øh* are left out (Brinkmann & Tanggaard, 2015, p. 44).

## **TRANSLATIONS**

I have only translated the quotes from Danish to English that I utilize in the thesis due to the time constraints. During transcription, I have taken responsibility in the choice of my words, and I have tried to be as close as possible to the respondent's choice of words in order to capture the connotations, concepts e.g. that describe the actions and personalities of the interviewees (Eriksen, 2005, pp. 45, 46) (Haraway, 1988, pp. 597, 598).

## **2.3 PARTICIPATORY OBSERVATIONS**

During data collaboration, I have used participatory observations to describe and analyze the social, *situated*, and the particular that happens in social practice (Szulevicsz, 2015, p. 86). I have taken into account the method's six phases when collecting the participatory observations (Szulevicsz, 2015, pp. 86, 87). I have also taken notes during and immediately after the knowledge-sharing bus-trip ended. For instance, I have made verbatim notes of what individuals said (Szulevicsz, 2015, p. 92). These notes of observations are essential to creating concrete and sensory details of individuals' moods and their interplay and interactions with others (Szulevicsz, 2015, p. 93). I have also anonymized the individuals' names and other personal information. The observations have taken place during the following occasions:

- ❖ A tour in 'Labitat' 13 November 2018

- ❖ At an Open house event in 'Fablab Nordvest' 15 November 2018
- ❖ At 'Orange Makers' 6 March 2019
- ❖ At the KSBT among the different initiatives in Greater Copenhagen and Roskilde 6 April 2019

## 2.4 DOCUMENTS

I have used documents as empirical material to analyze the non-passive and mediated motives through articulations, definitions, and identifications that give rise to issues but also create ideas to possible solutions (Lynggaard, 2012, p. 227). I use documents as part of my empirical materials because these documents tie the MMGC&R together. They describe the community, practice, identities and the meaning-making processes concerning hacking, Hackers, making and Makers under the topic of 'Doing things together' in the global Maker Movement and the communities of practices in the MMGC&R. This analysis will not examine how ideas in the documents are collected or how ideas change over time. Instead, it will take inspiration from 'Actor-Network Theory'. Thus, are the documents analyzed in terms of their relation rather than the essence. Thus, the documents are examined as transforming ideas by their use, practice, what they *do* in the interaction between humans in both bodily and spoken act, and the shift in interpretations and meaning-making processes (Lynggaard, 2012, p. 222) (Mik-Meyer, 2005, pp. 194, 195). I particularly pay attention to the institutional frame that originates the content in the '*primary documents*,' and '*tertiary documents*' that are *situated*, as the different institutional frames of initiatives and specific contexts shape the meaning-making processes and assign specific meanings to the documents. In this way, documents enable what Latour calls 'Action at a distance' (Mik-Meyer, 2005, pp. 196, 197).

### DOCUMENTS USED

In chapter 5 and 6, I will draw on '*tertiary documents*': The notes I took during my participation in meetings, observations during the bus trip, and the transcriptions from the first and second meeting. The meetings have not been

transcribed in full as they lasted from 1 to 1,5 hour each. I have transcribed the parts I found necessary for the narrative. I also used excel sheets: One with the information of contacts, initiatives, number of participants; Second, with a time schedule, e.g., the information of program, plans, and roles. I have also used memos taken during Skype and offline meetings and emails in relation to the KSBT.

In the timeframe of the coordination of the KSBT these '*primary documents*' have circulated among a group of four participants in the MMGC&R. These documents are difficult to get hold of, as some of the documents include sensitive information: hence anonymized (Lynggaard, 2015 p. 154). In chapter 4 one '*tertiary document*' was used: Section 5. '*Præsentation af Orange Makerspace*' in Stine Broen's thesis 'In the making' utilized to create questions to 'Orange Makers' and also referred to when writing about their membership (Appendix 6: Stine broen christensen's thesis, In the making, section 5. 'Præsentation af Orange Makerspace'). Last, I have used the three webpages at the website *fabfoundation.fablabbcn.org*: '*The FabLab charter, What Qualifies As A Fab Lab?*' and the '*Fab foundation mission*' located under '*About*'. The pages help me to describe what a FabLab is, which defines what FabLabs shall fulfill and what the purpose and history behind the FabLab are (Fabfoundation, 2019).

## **IMAGES**

Images were taken with my mobile phone, and I have anonymized the managers that would not have their face shown. I have taken pictures during the coordination of the KSBT and during the KSBT. I argue they are part of the documents as they illustrate the narratives reifications of the artifacts: Screenshots of emails of how we coordinate, or images of how the Makers observed the artifacts that they centered on. The images are part of appendix 5, and I have given them numbers, which I refer to later on during the analysis.

## **ORGANIZING ANALYTICALLY WORK**

I have created tables in word to get an overview of the roles of the managers that I have interviewed. By gathering the different interviews and observations of the manager's roles, the tables have enabled me to see where they started being part of the MMGC&R, how many *brokers* there are, how many titles that managers have and their areas of responsibility. This helps me to write the managers and their roles into a narrative. See the tables in 'Appendix 8: Organizing analytically work'

## **3. LITERATURE**

### **3.1 THE HACKER MOVEMENT, THE MAKER MOVEMENT & THE MINDSET**

Many authors have written about the Hacker movement. Nonetheless, many inevitably have an agenda when writing about what constitutes the Maker Movement. For instance, Hatch (2014) had an agenda as the former CEO of 'Techshop', Anderson (2013) had an agenda as the editor-in-chief of 'Wired' magazine, and the co-founder of '3DR', Dougherty (2016) has an agenda as the founder of 'Make magazine' (2005) and 'Makerfaire' (2006) (3DR, 2019) (Dougherty, 2016, XI). In order to describe the history of the Hacker movement, I thus draw on the work of maxigas, whom is a Ph.D. candidate at the Open University of Catalonia Internet Interdisciplinary Institute and researcher at the Metatron Research Unit (Krisis, 2019). He has written several articles of Hacklabs and Hackerspaces. Here, I use two of them: 'Hacklabs and Hackerspaces - tracing two genealogies' (2012) and 'Cultural stratigraphy: A rift between shared machine shops' (2014). Next, I draw on these two articles to provide an overview of the history of the Hacker movement and the Maker Movement, in particular of the international and the European 'Hackerspace' and Maker Movement.

The autonomous movement of Hacklabs and Hackerspaces grew out of Hacker clubs. As maxigas (2012) writes: "*Guilds of the medieval era, [3]*

gentlemen's clubs dating from the 18th century [4] and the working men's clubs which began in the 19th century all exhibited aspects similar in one way or another to shared machine shops like hacklabs, hackerspaces, Fab Labs, medialabs, co-working spaces and the like (p. 3). Yet, what Wallerstein has coined as the "cultural shock" of 1968" made an impact on the movement as youth cultures raised objections against the capitalism: The form of welfare state and its eastern manifestation as 'bureaucratic capitalism' (Wallerstein, 2004, p. 85, cited in maxigax, 2014, p. 4). Stemming out of the cultural shock, according to maxigax (2014) states: "the first wave of pioneering hackerspaces were founded in the 1990s, just as were hacklabs" (Farr, 2009, cited in maxigax, 2014, p. 5). maxigax (2012) further elaborates and argues:

*"In particular, I argue that technology is framed by politics for the generation of hackers who invented and operated "hacklabs" in the beginning of the naughties (here 1999) in squatted social centres. Conversely, politics is framed by technology for those who founded the first "hackerspaces" in the Netherlands a decade later (2009) in so-called "anti-squat" rented spaces" (p. 1).*

From this quote, we can see that Hacklabs and Hackerspaces share the same cultural references. Hacklabs became visible in their independent media activism via the pirate radio and Pirate bay as maxigax (2012) quotes: "Adrian Jones (2009) argues for a structural but also historical continuity in the pirate radio practices of the 1960s and contemporary copyright conflicts epitomised by the Pirate Bay" (Johns, 2009, cited in maxigax (2012)). The Hacklabs were placed in squatted social centers, which were an alternative to official institutions operated by the state, and capital that resulted in 'squat wars' during the nineties with the rise of neoliberalism since they had to fight for their territory (maxigax, 2012, p. 2). However, the Hacklabs had trouble surviving as maxigax (2012) writes: "With the rising socio-economic profile of DIY and the falling popularity of social movements, hacklabs could not follow technological development economically and sustain their social basis politically, so they largely withered away"(p. 2). The Hacklabs were more politically autonomous. The

Hackerspaces are anarchistic, more liberal, and are renting the places in which they are located (maxigas, 2012, p. 1). The first Hackerspace wave started in 1990, maxigax (2014) clarifies how: *“The hackerspaces concept solidified around 2007, based on existing projects and experiences. The following years saw incredible proliferation across Europe and North America, and a less pronounced growth in other continents too”* (p. 4). Hereafter, Hacker camps was started by the first Hackerspaces in the Netherlands as maxigas (2014) writes: *“Following the aforementioned hacker camp HAR2009, the first or second hackerspace to be established in the Netherlands was RevSpace (Den Haag), whose members have done much to promote the concept, including using the HXX Foundation (the legal entity behind the camp) to promote the hackerspaces model”* (p. 4). Since the Hackerspaces were part of the popularity of the Hacker concept, they started to make internal development via hackerspaces.org (maxigas, 2014, 2012 pp. 4,5). maxigas (2012) illustrates: *“What sets hackerspaces apart – along with most fablabs – is that they are set up by hackers for hackers with the principal mission of supporting hacking”* (p. 4). Thus, Hackerspaces is a social club for Hackers, and run by Hackers, and that support hacking. In 2012 when the article from maxigas (2012) was published, he argues: *“It is probably safe to state that hackerspaces are at the height of their popularity at the moment. ... Many different institutions and initiatives are now calling themselves “hackerspaces”* (p. 4). The Hackerspaces are highly male-dominated, but over the years, they have become more welcoming to women and sexual minorities (maxigas, 2012, p. 7). Also, they teach educational and infrastructural services to the public while being a grass root joint workshop of technology, research, and development (maxigas, 2014, 2012, pp. 4, 4). maxigas (2012) describes how this has become the case: *“They emphasised an open membership model for maintaining a common workspace that functions as a cooperative socialising, learning and production environment”* (p. 5). The mechanism of Hackers collaborating in a shared space entailed the trend of tinkering with computers and used new as well as old technologies (maxigas, 2012, p. 5). Their projects include free software development, computer recycling, wireless mesh networking, microelectronics, open hardware, and 3D printing (maxigas, 2012, p. 5).

maxigas (2012) describes how especially microelectronics was popular in the Hackerspaces and how: *“Physical computing was layed out by Igoe and O’Sullivan in Physical Computing: Sensing and Controlling the Physical World with Computers (2004), and had a great impact on the whole computing scene”* (Igoe & O’Sullivan, 2004, cited in maxigax, 2012, p. 5). The framework made a path for interaction between the human and machine and the everyday humans’ bodily situations, which opened an exploratory research field (maxigas, 2012, p. 5). In 2005 in Europe, Massimo Banzi started to work on a programmable microcontroller board named ‘Arduino’ (maxigas, 2012, p. 4,5). In 2012 Hackerspaces is the only place citizens could get access to and learn about 3D printers and microcontrollers, maxigas (2012) argues *“At the time of writing, they are the only spaces where a general public can freely access and learn about such devices, although it is not clear whether these will become as ubiquitous in daily life as computers and networks”* (p. 7).

## **THE HISTORY OF THE HACKER MOVEMENT IN EUROPE AND THE USA**

The history of the hacker movement in Europe includes the Chaos Computer Club (CCC), founded by Way Holland in 1981 that was located in Hamburg in an old shattered building from the municipality (maxigas, 2012, p. 4). Present, they are the largest association of hackers in Europe that run on hacker ethics which includes the independent Internet security research (Chaos Computer Club, 2019) (maxigas, 2012, p. 5). As a complement, the Gray hat information security experts see full disclosure as the best way to ensure a stable infrastructure and the freedom of communication by the practice of releasing information and tools that reveals security flaws to the public (maxigas, 2012, p. 5). Through conferences, camps, and gatherings the movement became popular. The Chaos Communication Conference (CCC) has run since 1984, and in the USA the H.O.P.E conference started in 1996: Both are still going strong. ‘Hackers on a plane’ was an event in 2007 that brought hackers from the USA to the Chaos Communication Conference. The year after the communication platform, hackerspaces.org was created for the

international movement where topics of how to manage problems and grow a community were discussed (maxigas, 2012, p. 5).

## **THE NEXT GENERATION**

According to maxigas (2012): *“Fablabs may be the next generation of the hackerspace evolution, focusing on manufacturing of custom-built objects. It is framed as a re-imagining of the factory with inspiration from the peer production model (MIT’s Center for Bits and Atoms, 2007)”* (p. 4). From this, we can see that there are linkages between the concepts in the history of the Hacker movement and how it leads to the history of the Maker Movement.

## **THE MAKER MINDSET**

Even though the Maker Movement is decentralized, I argue that there is a shared mindset. As Dougherty (2016) writes, *“the process of realizing an idea and making it tangible is what defines a maker”* (Dougherty, 2016, p. 143). Also, the process of making involves what Korn, (2017) calls *“a dance of making”* as he describes: *“This is not to say that I wasn’t thinking – just that I had become far more adept at making decisions. Mind, hand, and body were reading from the same page; they worked together seamlessly”* (Korn, 2017, p. 51). The process of making is similar to what the psychologist Mihaly Csikszentmihalyi has termed *“flow”* (Korn, 2017, p. 54) which is the creative state of mind that makes us happy where we pursue what the Craftsman, Richard Sennet describes as *“learning to do something well, for its own sake”* (Sennett, 2009, cited in, Korn, 2017, p. 53). Thus, the process of making is very personal, and that is the reason why we go through the experimenting process repeatedly. Being passionate about our ideas, developing them, and sharing them with others gives our life a purpose and meaning (Dougherty, 2016, p. 143). In relation to Korn, (2017) Dougherty (2016) writes, *“Makers acquire the mindset through the practice of making. It is not intentionally sought out of its own – it develops with experience”* (Dougherty, 2016, p. 144). The practice of making carries activity, playfulness, resources, engagement, and self-directedness as the Makers’ ability evolve to learn what they need to learn and overcome failures (Dougherty, 2016, p. 144). Dougherty (2016) also describes how the mindset

feature what Stanford psychology Professor, Carol Dweck writes in her book 'Mindset: The new psychology of Success' (Dougherty, 2016, p. 144). Dweck (2016) explains: *"For thirty years, my research has shown that the view you adopt for yourself profoundly affects the way you lead your life. It can determine whether you become the person you want to be and whether you accomplish the things you value"* (Dweck, 2016, p. 1). We are not stamped from birth with a mindset, but what we believe about ourselves changes how we live our lives (Dweck, 2016, p. 4-6). In relation to what Donna Haraway (1988) writes, *"Feminist objectivity means quite simply situated knowledges"* (Haraway, 1988, p. 581). The demography of where we grew up, is part of our *situated knowledge* that determines how we think of ourselves and which mindset we have (Haraway, 1988, p. 581). Dweck (2016) writes about the fixated mindset: *"Believing that your qualities are carved in stone – the fixed mindset – creates an urgency to prove yourself over and over. If you have only a certain amount of intelligence, a certain personality, and a certain moral"* (Dweck, 2016, p. 5). The fixed mindset believes that the capabilities are already determined; hence, new abilities cannot be developed (Dweck, 2016, p. 5). People who believes in the fixed traits are in danger of being measured by failures since the mindset never thought them the ways to cope (Dweck, 2016, p. 38). On the contrary, Dweck (2016) writes *"This growth mindset is based on the belief that your basic qualities are things you can cultivate through your efforts, your strategies, temperaments – everyone can change and grow through application and experience"* (Dweck, 2016, pp. 4,5). Failures still hurt people with the growth mindset, but it is not what defines them, as their basic qualities can be developed (Dweck, 2016, p. 38). Dweck (2016) describes that *"...if abilities can be expanded – if change and growth are possible – then there are still many paths to success"* (Dweck, 2016, p. 38). Also, at the college transition, Dweck (2016) finds that: *"Once again we found that the students with the growth mindset earned better grades in the course. Even when they did poorly on a particular test, they bounced back on the next ones. When students with the fixed mindset did poorly, they often didn't make a comeback"* (pp. 58-60). It inspires people to believe that their own actions matter, and instead of accepting the status quo, we can change the world

(Dougherty, 2016, p. 145). This is the mindset that leads to creativity and innovation, and it is an expression of the 'Maker Mindset' which is the reason why Makers are willing to learn new tools and methods just as experimenting without certainty of success (Dougherty, 2016, p. 145). This is the reason why Makers are true to their agency and are willing to take risks and do things that others have not done or seen before without any instruction (Dougherty, 2016, p. 145). Having the same mindset allows us to connect easier as we share the same repertoire (Dougherty, 2016, p. 144). Kelly Lambert, a professor of psychology at the Randolph-Macon college, writes how she studied how physical work can get humans out of depression. She found that there is a link between depression and motivation, pleasure, movement, and thought, and since the brain's areas communicate back and forth, it is a circuit. Lambert (2010) writes: *"Our hand's ability to carry out the intentions generated by the effort-driven reward circuit is what makes their role so critical to our mental health. The hands' direct route to our motivation, positive emotions, and cognitive abilities confirms their importance in our mental as well as physical lives"* (p. 93). When the circuit is disengaged, we feel blue, but when the circuit connects the parts properly, we are engaged by our actions, alive in our minds and interact easier with others (Lambert, 2010, p. 94). Lambert (2010) describes: *"It's as if an electrical current is coursing through a network. When it's buzzing at top capacity –when, for example, installing that new light fixture requires both hands – the cells in those areas of the brain are turned on and secreting neuro-chemicals, such as dopamine and serotonin, which are involved in generating positive emotions"* (pp. 49, 50). It is the physical, visible, tactile activities that produce a result that brings fuel to the circuit (Dougherty, 2016, p. 146). Lambert (2010) states that: *"Our hand's integral relation to the effort driven rewards circuit has led to the amazing resilience and productivity and species."* (p. 94). Thus, Makers think and communicate with their hands (Dougherty, 2016, p. 146).

## 3.2 COMMUNITIES OF PRACTICES

Having defined the Hacker movement, the Maker Movement & the Maker Mindset, I will now move on to explain Communities of practices (CoPs). Etienne Wenger is a social learning theorist that focuses on social learning systems and the understanding of the connection between knowledge, community learning, and identity (Etienne's home page, 2019). To describe CoPs, I will use a book and an article from Wenger: The book named '*Praksis fællesskaber*' and the article named 'Communities of Practice and Social Learning Systems' (Wenger, 2000, 2004). Wenger (2000) writes: "Since the beginning of history, human beings have formed communities that share cultural practices reflecting their collective learning: from a tribe around a cave fire to a medieval guild, to a group of nurses in a ward ...". The reason why I am using Wenger (2000, 2004) is that the various initiatives in the MMGC&R each are CoPs (Wenger, 2004, p. 259). CoPs concern substance and not the form as learning is the living experience of meaning negotiation. CoPs are not reification units that can be designed. Instead, they can be recognized, supported, prompted, and be nursed (Wenger, 2004, p. 259). CoPs are related to the identity as a *negotiated experience* as it is the practice that helps us to imagine ourselves in relation to the world and know our identity, so we know who we are in relation to our fellow citizens and which CoPs we want to participate in (Wenger, 2000, p. 228). Thus, *memberships of CoPs* are made through the known and unknown that define who we are, which creates a *learning path* from where we are and where we are going (Wenger, 2004, p. 6). As the identity cannot be turned on and off, we carry a bit of ourselves in each of the CoPs we participate in, which constitutes *Multimembership* (Wenger, 2000, p. 239). We manifest styles and discourses by negotiating the local ways of belonging in the broader constellations, and this defines who we are in *relation to the local and the global* (Wenger, 2004, p. 6).

### LEARNING

Central to the concept of CoPs is learning, as CoPs are the foundation that creates the social leaning systems in which we place our competence. Wenger

(2000) describes them as “social ‘containers’” since our identity is shaped through competence and experience that holds the knowledge and thus determines what is important for us: whom we trust, what we identify, with whom we share (Wenger, 2000, pp. 229, 239). Because we are social beings the competence is related to the enterprises, we value which gives us knowledge about when we have discovered scientific facts, how to repair machines or how it is to grow up as a male, female or another sex (Wenger, 2004, p. 14). We can only gain these insights by participating in practicing these enterprises. So, it is through meaning that the learning processes are created as our ability to experience the world and our engagement in the world defines what we value as meaningful to us (Wenger, 2004, p. 14). As discussed above, making is a state of being and an experience of engaging with the world. Wenger (2004) comments that “*The focus of this theory is primary learning as social participation and participation ... is related to the comprehensive process of being an active member of a community’s practices and constructs one’s identities in relation to the communities*” (p. 14). From this, we can see that the practice of making is related to the shared mindset when as Wenger (2004) states, “*Families ...develop their own practices rituals, artifacts, symbols, conventions, stories, and histories. Families hate each other, and they love each other; they agree, and they disagree. They do what is necessary for making it work*” (p. 16). In order to make a family work, there needs to be *shared routines* and procedures as when using the machines or coordinating. Wenger (2000) call them “*processes*” (p. 236). Just as a *shared repertoire, shared engagement, and the shared responsibility* are part of CoPs *joint venture* (Wenger 2004, p. 90). Becoming a Maker and developing the growth mindset is a learning process that takes place through experimenting, playing, engagement, resources, self-directedness, and sharing knowledge. The process leads to one big *family* of Makers with a shared mindset (Wenger, 2000, 2004, pp. 236, 89-104), (Dougherty, 2016, pp. 144, 145).

## **LEADERSHIP**

Members of CoPs take different roles of internal leadership: *Community coordinators* take care of day-to-day practice, *Thought leaders* inspires to participating and create a learning agenda e.g., some are *Networkers*, people who *document* the practice and some are *Pioneers* (Wenger, 2000, p. 231). *Brokers* are the ones that move across initiatives in the MMGC&R and help by introducing elements of one practice into another. There are three kinds of brokers: *Boundary spanners*, *Roamers*, *Outpost* and *pairs* (Wenger, 2000, p. 235). The managers various roles in MMGC&R are evident in 'Appendix 8: Organizing analytical work' and chapter five.

## **ARTIFACTS**

Part of CoPs is artifacts: Documents, tools, stories, symbols, websites e.g., Artifacts become boundary objects through the participation of members of the CoPs (Wenger, 2004, p. 130).

## **3.3 BOUNDARY OBJECTS**

Star & Griesemer (2015) has created *boundary objects* that feature a collective identity that is robust enough to travel across sites while being flexible enough to adapt to the constraints and the local needs of the different initiatives exploiting them. They can be human as well as non-human, and I will use them for analyzing how we coordinate and communicate when collaborating on creating the KSBT (Star & Griesemer, 2015, p. 176). There are four kinds of boundary objects: The first is the one that Star & Griesemer (2015) calls *Repository*: Systemized 'piles' that are indexed in a standardized fashion as a library where people from the different communities of practices can use and borrow for instance books without having to negotiate the different purposes (Star & Griesemer, 2015, p. 191). The second is *ideal type*: An object or a diagram that can be an atlas or a diagram that does not precisely indicate a location or a thing which entails that it is adaptable to different sites as it serves as means of communicating and cooperating symbolically (Star & Griesemer, 2015, p. 191). The third is *coincident*

*boundaries*: Common objects having the same boundaries but different internal content. The result is that different sites with different perspectives can conduct work autonomously while cooperating parties share a common referent. The fourth is *standardized forms*: Methods or common communication made to travel across distributed areas and still maintain the same standard of method and communication locally in the CoPs. (Star & Griesemer, 2015, p. 192).

### **3.4 SITUATED LEARNING**

In relation to Wenger's CoPs being centered on learning, I will use *situated learning* to describe how 'Fablab Nordvest' and 'Orange Makers' integrate newcomers in their practice. Lave and Wenger use *legitimate peripheral participation* to illuminate the relations between *newcomers* and *veterans* and the process where *newcomers* become part of the CoPs and how learning is part of creating the identity (Lave & Wenger, 2003, p. 31). *Legitimate peripheral participation* comes through participation in a social practice with learning as the integrated part. The focus is on how and what the newcomers learn by participating in different social activities (Lave & Wenger, 2003, p. 36). Lave & Wenger (2003) describes how: *Legitimate peripheral participation* is divided into two: "*Peripheral participation is about being situated in the social world. Changing locations and perspectives are part of the actors' learning paths, developmental identities, and forms of membership*" (p. 37). Wenger (2004) describes:

*"To open a practice, peripheral participation must give access to all three practice dimensions: to mutual engagement with other members, to their actions and their negotiation of the enterprise, and the repertoire used. Regardless of how the peripheral is achieved in the initial participation, it must engage the newcomer and give them a sense of how the community works"* (pp. 121, 122).

In addition, Lave & Wenger (2003) writes:

*“... Legitimate peripheral is a complex concept implicated in social structures that involve power relations ... a place where one moves towards more intensive participation peripherally is a qualifying position”* (p. 37). The newcomers’ *legitimate peripheral* provides them with an observational position that is decisive in connection with *participation* as a way of learning and being absorbed in the practice culture (Lave & Wenger, 2003, p. 80). Based on this, there is a general perception of what makes up the practice (Lave & Wenger, 2003, p. 81). The apprentice learns more together with other apprentices, because: *“In order to allow for the circulation of knowledge among equals and near-equals, it spreads excessively quickly and efficiently”* (Lave & Wenger, 2003 p. 79).

### **3.5 HACKER ETHICS**

To describe how the Hackerspace ‘Labitat’ operates ‘The Hacker ethics’ is utilized: A philosophy, an ethic and a dream that has never had a manifesto or missionaries that tried to gather converts (Levy, 2010, p. 27). A computer basically, did the converting and the ones who wanted to; followed the hacker ethics (Levy, 2010, p. 27). It consists of six elements:

1. You should have access to computers so you can be taught anything you need to know about how the world works, meaning that all information should be unlimited and total (Levy, 2010, p. 28). This should include the hands-on imperative. This has a relation to what John Dewey wrote, *“Learn to do by knowing and to know by doing”* (Held, 2014). This quote and element explain that you should be able to know how to take things apart, seeing how they work, and using this knowledge to create more exciting things: knowing by doing in practice. They resent physical barriers, persons, or law that keeps them from doing this (Levy, 2010, p. 28). The rule applies when a Hacker wants to fix something broken that needs improvement or is an imperfect system. For instance, taking a gas sign apart, so it shows the clock instead of the current prices for gas (Levy, 2010, p. 28). The rules,

which prevent you from taking matters into your own hands, are too ridiculous even to consider (Levy, 2010, p. 28).

2. *All information should be free*: It is a matter of creating the information of written system programs to make programming easier enabling you to debug systems easier instead of individuals reinventing the wheel: the best version is available to everyone for modification (Levy, 2010, p. 29).
3. *Mistrust authority – promote decentralization*: How you should prevent the bureaucracy and why the system should be open as there should be no boundaries between a Hacker and a piece of information (Levy, 2010, p. 29).
4. *Hackers are judged by their hacking, not bogus criteria such as degrees, age, race or positions*: The meritocratic traits which for instance is the grades in school or a university is characterized as superficial as it is how good you are at coding that counts (Levy, 2010, p. 30).
5. *You can create art and beauty on a computer*: Describes how you should not write sloppy code since it will take up more desk place than needed (Levy, 2010, p. 31).
6. *Computers can change your life for the better*: When you have fixed a behavioral problem, in a computer or a program, it is fixed forever (Levy, 2010, p. 31). The computer shall be seen as Aladdin's lamp as it is a matter of creating code or a program, so it does your bidding (Levy, 2010, p. 34).

### **3.6 AUTHENTICITY**

As I will explore in later parts of the thesis, membership, and belonging in the Maker community are closely tied to questions of authenticity. I will draw on

work by the sociologist, Anselm Strauss, and more recent work by Bossen and Lauritsen to explore the importance of authenticity in membership. Since the area of interest in the MMGC&R includes a communicative practice, the concept of authenticity is utilized to analyze how people in these initiatives are associated with activities of coordinating, fixing machines, collecting machines, e.g. (Bossen & Lauritsen, 2012, p. 145) (Strauss, 1978, p. 123). How people think of themselves and how authentic they are in relation to the primary activity of making and hacking will be examined (Bossen & Lauritsen, 2012, p. 145) (Strauss, 1978, p. 123). Usually, authenticity is related to the quality of action but *segmenting* is part of authenticity resulting in the formation of new sub-worlds. The formation happens when new members float into the old social world and are not allowed in or not allowed all the way in (Strauss, 1978, pp. 123, 124). New members often do not have the same “room for speaking” as old members and thus more authentic members. Since technologies and actors can shift, this means the borders of the social world and the social world itself can also change (Bossen & Lauritsen, 2012, p. 145). This can create repercussions among social worlds and sub-world and can lead to discussions and battles on who has the right to use the object or technology (Lauritsen, 2012, p. 145). However, this can change in socialization processes where new members win authenticity if they, for instance, are good at handling the technology(ies) (Bossen & Lauritsen, 2012, p. 145). Who decides or which organizations decide the authentic is analyzed and the power relations are spelled out so that I can examine which allocations, assigning and bereaved resources that the situation entails (Strauss, 1978, pp. 123, 124). Also, Strauss (1978) explains non-authenticity, which is ex-communication, a strategy that includes activities and products of activities (Strauss, 1978, p. 124). Strauss (1978) argues that the non-authenticating “... raises questions about near fakes, downright fakes, and production only of the “real stuff” as well as the manipulation or perspective of differential audiences and markets” (Strauss, 1978, p. 124). This will be used to write about how the initiatives look at and classify each other (Strauss, 1978, p. 124).

### 3.7 OTHERING

*Othering* consists of the self-identity that originates in the exclusion of everything outside oneself and therefore is *othering* based on the self-consciousness that sees the *other* as self and not-self by seeing itself in the other (Brons, 2015, p. 70). In relation to Haraway's *situated knowledge* Nagel 1986; Haraway 1988 in Brons (2015) writes, "The neutral point of view is a point outside all perspectives, outside all cultures, languages, systems of belief, and so forth. It presumes what Haraway (1988: 582) calls "a god trick." The problem is that there is, and cannot be such a point of view" (Brons, 2015, p. 71). As the self-identification is *situated* and localized, what is valid for the self's *situated knowledge* must be true for the other encountered intelligent perceiving human as well (Brons, 2015, p. 71). When the self-consciousness *situated knowledge* does not match the other, it creates a difference between the self-other in-group and the self-other out-group (Brons, 2015, p. 71). Brons (2015) distinguishes between two kinds of *otherings*: The *crude othering* and the *sophisticated othering*. What distinguishes these two types of othering is the form (Brons, 2015, p. 70). There is no hard boundary between them as *sophisticated othering* quickly can change into *crude othering* and vice versa since is the loss of an original argument in *sophisticated othering* that makes it *crude othering* (Brons, 2015, p. 71). In the *crude othering*, the distribution of the undesirable characteristic is posited or assumed since it does not depend on the reason, it is difficult to counter by reason (Brons, 2015, pp. 70, 72). In the *sophisticated othering*, the self-other distinction plays a decisive role in the process as it is the biased self-other identifying assumption that characterizes it (Brons, 2015, p. 70). It is the apparent reasonableness that makes *sophisticated othering* pervasive; based on the hidden argument and the welcoming conclusion it may get a non-critical acceptance (Brons, 2015, p. 71).

### 3.8 ENACTMENT

Ann Marie Mol (2002) states: *“it is possible to refrain from understanding objects as the central points of focus of different people’s perspectives. It is possible to understand them instead, as things manipulated in practices”* (Mol, 2002, p. 5). In this philosophical mode, the practices are foregrounded. Instead of taking the epistemological focus of *“how to find the truth,”* the focus is on *“how objects are enacted in practices”* (Mol, 2002, p. 5). This entails that *“realities multiple”* as the patient, the doctor, and the technician each are *multiple* in the practices. Thus *“... objects differ from one practice to another ...”* (Mol, 2002, p. 5). Meaning that *“... objects comes into being – and disappear – with the practices in which they are manipulated”* (Mol, 2002, p. 5). Thereby *“No object, no body, no disease is singular”* (Mol, 2002, p. 5). In the practices *“Knowledge is not understood as a matter of reference, but as one of manipulation ...”* since it is the practices that manipulate the objects (Mol, 2002, p. 5). An object is, for instance, when the patient articulates the symptoms of atherosclerosis through an interview with a nurse (Mol, 2002, pp. 13, 14, 15). Another object is when the doctor looks at atherosclerosis through the microscope, but *“There are relations between the practices”* (Mol, 2002, pp. 5, 29, 30, 31, 32, 33). The objects start to coincide, as there is atherosclerosis in both practices. In relation to the MMGC&R there are different needs from the managers in relation to participating in the KSBT but there are needs in both practices (Mol, 2002, p. 44). *“Thus, the objects can be compared. The pain of the clinic and the thick intima’s of the pathology department are mapped”* (Mol, 2002, p. 44). The objects in the practices get a common reference when *“... a piece of vessel is available, a link can be made”* (Mol, 2002, p. 45). *Enactment* is the practice that is made in different practices. *“It is possible to say that in practices, objects are enacted. It suggests that activities take place – but leaves the actors vague. It also suggests that in the act, and only then and there, something is – being enacted”* (Mol, 2002, pp. 32, 33). The practice is multiplied and manipulated through the multiply of people’s knowledge. *“Knowledge is not understood as a matter of reference, but as one of manipulation”* (Mol, 2002, p. 5). I will use *enactment* in

chapter 5 to examine how the different initiatives have articulated their needs and how objects have been enacted.

### **3.9 SITUATED KNOWLEDGES IN COLLABORATION**

As mentioned above I am *situated* in the MMGC&R when writing this thesis however it is not only I that create the knowledge in this assignment as we are a collective of four members that have been planning the KSBT among selected Fablabs, Makerspaces, and Hackerspaces in Greater Copenhagen and Roskilde as a point of departure. Each of us has connections to the different initiatives, which means that the other managers will help by participating with their bodied contacts, information, and biased views. This also means that we all can affect the outcome of this thesis as *Situated Knowledge* turns knowledge into a product that is created of and in an interaction with the world. Knowledge is thereby processed, received, used, and paid for in various ways (Haraway, 1988, p. 577). The involved components, which are materials or humans, in this process, are accountable as they help to construct knowledge (Haraway, 1988, pp. 597, 598). Thus, the managers that have participated in interviews are *situated* as well as they have used their active perceptual system when stating their point of view (Haraway, 1988, p. 583).

## **4. DIFFERENT KINDS OF ORGANIZATIONS AND PEDAGOGICS**

I will, in this chapter, describe what a Fablab, a Hackerspace, and a Makerspace are. Moreover, I will also introduce how 'Fablab Nordvest', 'Labitat', and 'Orange Makers' are funded and run.

### **4.1. LABITAT**

The Hackerspace 'Labitat' was founded on 16 September 2009, which makes it the second initiative<sup>1</sup> in the Maker Movement in Zealand ([datacvr.virk.dk](http://datacvr.virk.dk),

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<sup>1</sup> According to the co-founder of illutron Mads (Hobye, 2014) illutron was formed in 2007. This makes it the first initiative in the Maker Movement in Zealand. It grew out of Half Machine founded in 2003.

Labitat, 2009) (Appendix 9: Martin, 7:14). I ask Martin how he would describe 'Labitat'; he says: "*I often refer to Labitat as a leisure club for Nerds ... Some people got an idea, then came a room, there came many activities, and we got a super nice reputation*" (Appendix 9: Martin, 50:07, 55:02). 'Labitat' is located at a 220-m2 basement in *H. C. Ørsted's Vej 5, 1879 Frederiksberg C* and it has grown from below as a grass-root (Labitat til Hørhusvej, 2013) (Appendix 5: Images, 1: Labitat door) (Appendix 9: Martin, 50:10, 53:56, 54:34.). 'Labitat' started by a group of friends getting an idea of creating the place, then they found a room, and this attracted people that had the same sense of humor (Appendix 9: Martin, 55:10.) 'Labitat' is not run by a leading group of people per se since they have much replacement. Still, several of the members hang on via their mailing list, which contains 450 members (List/labitat, 2019) (Appendix 10: Participatory observations, Labitat). They have an IRC (Internet Relay Chat) channel, and they are making an attempt at open-source documentation of their research on a WIKI (Appendix 9: Martin 53:56) (Labitat, 2019). 'Labitat' is an association, which means that they have a board that is seen as a formality as the members' titles are: All equal and unequal (Appendix 9: Martin 1:21). However, every year at their annual general meeting (AGM), their members show up even though they are against the idea of a board (Appendix 9: Martin, 54:58). You are not obligated to pay for a membership fee as they see money as a necessary evil (Appendix 9: Martin, 16:03). 'Labitat's' membership does cost 150 DKR and is seen as donations to 'Labitat's' survival: and as long as these match 'Labitat's' expenses they will continue (Appendix 9: Martin, 12:32, 7:14). As a member of 'Labitat', you get a chip to get in and out of 'Labitat' (Appendix 9: Martin, 27:03). If you do not have a membership, a member will open the door for you (Appendix 10: Participatory observations, Labitat).

*"If a person then has been here for half a year three times a month and someone else has opened the door for him or her, we start to cast a sidelong glance at him or her and will eventually start to comment on it. It takes a couple of pizzas and a few sodas, I mean, come on"* (Appendix 10: Participatory observations, Labitat).

When Martin mentions that the members will “*cast a sidelong glance*” it is a way to get the newcomers integrated in being part of the system of shared responsibility: what you should do, what you should not do, what is meaningful and what is not e.g. (Wenger, 2004, p. 99). Martin says: “...*A long time ago, we said that Labitat is apolitical*” (Appendix 9: Martin, 40:35). The reason is that, for instance, the technical interest in 3D printing, programming, IT security, the design is the focus of ‘Labitat’, but it does not mean that one needs to have technical experience or be educated in order to be a member (Appendix 9: Martin, 12:42). The word apolitical in the Merriam-Webster dictionary refers to: “*having no interest or involvement in political affairs also: having an aversion to politics or political affairs 2: having no political significance*” (Merriam-Webster, 2019). Yet, it does not mean that the members of ‘Labitat’ take a neutral standpoint to politics since they are part of the Hackerspace culture, but ‘Labitat’ accommodate a variety of different politics. Some of the members work with ‘White hack hacking’ and as maxigas, (2012) states: “... *the superuser<sup>2</sup> command says, “With great power comes great responsibility”*” (p. 8). Which compliments what Martin says: “*So if there are some who are making trouble, then that’s not something we’re talking about*” (Appendix 9: Martin, 10:55). ‘Labitat’ is centered on activity because it is contributing to activity and being part of the social relations that are the primary purpose of being a member (Appendix 10: Participatory observations, Labitat). This compliment their organizational structure that is based on *do-ocracy*<sup>3</sup>, where responsibilities are attached to the people that *do* the work. This implies that individuals choose their roles and tasks and execute them by themselves (Appendix 29: Participatory Observations, KSBT) (Appendix 10: Participatory observations, Labitat). ‘Labitat’ manages

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<sup>2</sup> *Superuser* or *Root* is an access mode in computer operating systems to all files and programs in all modes (Single or multiuser) (nixCraft: Linux and Unix tutorials for new and seasoned sysadmin, 2017).

<sup>3</sup> See Appendix 1: Definition of concepts, Do-ocracy.

the Hackerspace by one rule: *"Don't act in a way that require us to make a new rule"* (Appendix 10: Participatory observations, Labitat). However, it still requires a lot of negotiations between the members *"We are insane hoarders all of us"* (Appendix 9: Martin, 55:01). During the knowledge-sharing bus-trip, 'Labitat' jumped into 'Fablab RUC's' container with electronic parts that were thrown out and came back to the bus with screens, cords, and print boards (Appendix 10: Participatory observations, Labitat). The hoarding disorder creates complex negotiations about what should be part of their materials since everyone is in charge, and nobody is in charge. You cannot just throw another person's stuff out if the person does not let you, even if it has been filling up the kitchen tables for two months. What do you do then? You negotiate to find a compromise so you and others can use the kitchen again (Appendix 9: Martin, 56:03). 'Labitat' does not have training in their machines or tools. They let the members play with the machines and tools and hack it or know it by finding out where the boundaries are. If somebody destroys something, that person will help get it fixed (Appendix 9: Martin, 46:41). For instance, a drill is a drill, but it can also be hacked into a lathe (Appendix 9: Martin, 46:41). However, if others have more knowledge than you, and they advise you and say: *'That's dangerous' or 'You're doing well in the process of destroying the machine'* (Appendix 9: Martin, 47:04). Then you should do it differently (Appendix 9: Martin, 47:15). They have an immediate desire to make which entails that one can get an idea in the evening and then go and try it out during the night with someone else to see if it is feasible (Appendix 9: Martin, 3:32) (Appendix 9: Martin, 3:42). The social relations are happening via sitting and gazing at Youtube videos and talking about new ways of making technology. This is for instance a tank sign that can be made into a watch, but in order to hack it, you need to know how the technology functions (Appendix 13: Participatory observations, Labitat). Here the members contribute with their knowledge, which helps them to make up different elements in the technology (Appendix 9: Martin, 33:20).

## CONVERSATION WITH LITERATURE

According to maxigas (2012): “Hackerspaces started in the late 1990s and became widespread in the second half of the 2000s” (p. 1). This fits with time period where the group of friends has gotten the idea of creating ‘Labitat’ and finding a room since the minutes on ‘Labitat’s’ wiki goes back to May 2009 (labitat.dk/wiki/Minutes, 2009). ‘Labitat’ is documenting their research via an open-source wiki which relates to what Levy (2010) writes about Hacker ethics: That you should have access to computers so you can be taught anything you need to know about how the world works (Levy, 2010, p. 27). This means that all information should be unlimited and total (Levy, 2010, p. 28). It also prevents the bureaucracy as there should be no boundaries between a hacker and a piece of information (Levy, 2010, p. 29). Therefore, the system should be open. ‘Labitat’s’ pedagogic method when teaching newcomers in their machines goes hand in hand with *the hands-on imperative*, which has a relation to what John Dewey wrote, “*Learn to do by knowing and to know by doing*” (Held, 2014). That is to say you should be able to know how to take things apart by for instance breaking a machine or tool so you can see how they work and thus use that knowledge to fix it again or giving it a new purpose in life and create more exciting things (Levy, 2010, p. 28). The rule applies when a Hacker wants to fix what is broken, needs improvement, or is an imperfect system. For instance, one can take the gas sign apart, so it shows the clock instead of the current prices for gas (Appendix 5: Images, 2: Gas sign) (Levy, 2010, p. 28). As ‘Labitat’s’ organization is based on *Do-ocracy*, their membership carries traits of that - their members are judged by what they *do*. The activity they make in ‘Labitat’ outplay, for instance, the meritocratic system of which grades they got in school or how high an education they have (Levy, 2010, p. 31).

## 4.2 FAB LABS

In this part, I explain how the 'Fab charter' is founded and how it is related to in the concept of 'Fab Labs' and thus 'Fablab Nordvest' which is a 'Fab Lab' free of the municipality and state.

First, I start by explaining what a 'Fab Lab' is. A 'Fab Lab' is an abbreviation for 'Fabrication laboratory,' which is a technical prototyping platform where learning, innovation, and invention become entrepreneurship through playing, creating, mentoring, and inventing (fabfoundation, 2019). The concept 'Fab Lab' stemmed from the Hacker movement, started at Massachusetts Institute of Technology (MIT), Center for Bits and Atoms (CBA), which was part of their research into computation and digital fabrication (maxigas, 2012, p. 4). (fabfoundation, 2019). Fab Labs are part of a global network that shares common processes and tools, which create distributed laboratories for research and invention (fabfoundation, 2019). Fab Labs operate outside the Fab Charter, which is a manifesto for Fab labs, and it is this I will use to analyze if Fablabs Nordvest is compliant with it (fabfoundation.org, The Fab Charter, 2019) (Appendix 5: Images, 3: Fab Charter). As shown in 'Appendix 5: Images, 4: World Map of Fab Labs' there are currently approximately 1000 Fab Labs in the world, and in Denmark, there are seven FabLabs (fablabs.io, 2019) (Fablabs.io DK, 2019). Part of that list is 'Fablab Nordvest' (fablabs.io/labs/fablabnordvest , 2019).

## 4.3 FABLAB NORDVEST

'Fablab Nordvest' grew out of 'Fablab Danmark', located at *Næstved* (Appendix 12: Leonard, 36:01). Part of 'Fablab Danmark' was their Mobile Fab Lab, where John had created a member association to organize the enthusiasts that wanted to be part of the 'Mobile Fab Lab'. When he left the job, he realized that several of the enthusiasts were living in Copenhagen, and together, they started to look for a place where they could create a Fablab and ended up in Copenhagen Nordvest district (Appendix 11: John, 48:50). At

first, they were founded under the name 'Iværkstedet' being part of *Områdeformnyelsen Fuglekvarteret*, which was an initiative to ensure the social and cultural diversity in the Copenhagen Nordvest district (Bispebjerglokaludvalg, Københavns kommune, 2011). This gave 'Iværkstedet' approximately three years to transform into 'Fablab Nordvest' and gain enough likability in the district so they could create an independent initiative (Appendix 11: John, 50:48). 'Fablab Nordvest' is currently located in two places at Copenhagen Nordvest district: at *Glentevej 70* inside *Hans Knudsens Institutet* (HKI) and at *Smedtoften 12*, an old fabrication place (Appendix 11: John, 53:10). HKI is an institute that works with getting people into work (HKI, 2019) (Fablab Nordvest/contact, 2019). 'Fablab Nordvest' has its opening hours from 2 PM or 5 PM until 10 PM every day except Sunday, where they open from 10 AM to 3 PM. They are an association, meaning that they have a board too (Fablab Nordvest, 2019) (Appendix 11: John, 01:00). However, it is not only the board that runs the Fab Lab due to 'Fablab Nordvest' revenue is based on memberships subscriptions, where each member pays 150 DKR every month. Currently, they have approximately 200 members and are not financed either by state or municipality (Appendix 11: John, 02:50) (Appendix 12: Leonard, 37:42) (Fablab Nordvest, 2019).

## **COURSES**

It is the members that run the courses in the machines as well as software and hold open houses on Wednesdays (Appendix 11: John, 02:50). The members that contribute to these activities get extra privileges (Appendix 11: John, 18:45). What 'Fablab Nordvest' is particularly good at is teaching and mediating, and therefore they hold many courses. "*So, we hold courses, we hold knitting courses, we hold robot courses, we hold serigraphy courses, we hold laser-cut courses, we hold CNC courses. There is nothing sacred down here, or there is nothing so crazy that it cannot be taught or communicated*" (Appendix 12: Leonard, 04:27). 'Fablab Nordvest', has machines for prototyping and computer-aided fabrication machines, manually and analog automated machines (Appendix 11: John, 29:58). At Smedtoften, 3 milling machines and one 'Precious Plastics' open-

source recycling plastic machines are placed in ship containers where the youngsters can make street and urban activities as long as they clean up after themselves (Appendix 11: John, 52:22, 08:07). The machines have drivers that contain the projects that people have made and qua the 'Fab charter' 'What qualifies as a Fablab?' A Fablab needs to share the projects with others. However, I asked John if 'Fablab Nordvest' did that, and he responded:

*"I think that many of the drawings that are sent, for instance, to the laser cutter there. - I don't bloody think it makes sense to others without some explanation. So I think knowledge sharing goes by a formal or real exchange of experience, that is, talking about things and then you can exchange, send and share some data with each other with such drawings. I don't think the informal or undercover knowledge sharing through the drivers plays any role"* (Appendix 11: John, 32:03, 32:19, 32:40).

The knowledge sharing takes place among the members who get to know each other via the courses. *"So basically, you must not run the machines down here unless you have been given a driver's license"* (Appendix 12: Leonard, 13:24). Because in order to use the machines, newcomers need to have a driver's license ... *it shouldn't be a secret that when you get that driver's license, then you are far from being an expert in the machines, but you know that you have to turn on and off and what not to do ...* (Appendix 12: Leonard, 24:07). As Leonard mentions, it will not make you an expert, which is why 'Fablab Nordvest' is launching expanded courses. *"Now, we are starting to try to launch some extended courses because there are some who would like to go beyond that driver's license stage. Then you can just have a go and go up on a sort of next level"* (Appendix 12: Leonard, 23:35, 24:07). The pedagogics behind the machines can be compared to an apprenticeship. *"We could also call them super users ... so there is really much apprenticeship in this ... but again, that is ... unstructured"* (Appendix 12: Leonard, 13:24). Some of the members are super-users and thus masters and help newcomers about how to use the machines. *"And then it is something like you're standing and looking over each*

*other's shoulders and get help, and our members are really, really good at that"* (Appendix 12: Leonard, 13:48). When the member has become experienced enough, they can start to make prototypes. *"The concept is that you develop your idea on some standard CAD-software, and then you can make prototypes of it. Maybe one small production on our machines, and then you can actually use the same data to sell to someone who has larger production equipment if you want to scale it up"* (Appendix 11: John, 30:18, 30:27). During the participatory observations, I heard a presentation where one of the board members in 'Fablab Nordvest' said that he would like 'Fablab Nordvest' to be like 'Techshop' – just cheaper (Appendix 13: Participatory observations, Fablab Nordvest). However, 'Techshop' was a chain of Makerspaces until it filed for bankruptcy in 2017 (Su, 2017).

## **CONVERSATION WITH LITERATURE**

I will proceed by referring to the 7 elements in the *Fab Charter* (Appendix 5: Images, 3: Fab Charter) and compare 'Fablab Nordvest' to *"What Qualifies As A Fab Lab?"* (Fabfoundation, 2019).

### ***"What is a fab lab?"***

The website [fablabs.io](http://fablabs.io) is a social network that gathers the international Fab Lab community, and when 'Fablab Nordvest' is part of this, they are making themselves visible in the global network of local labs ([fablabs.io/about](http://fablabs.io/about), 2019).

### ***"What's in a fab lab?"***

The courses that are held by the members in 'Fablab Nordvest' enable the newcomer to become part of the practice. As Lave & Wenger (1999) writes: *"It seems to be typical for an apprenticeship that the apprentice learns most in relation to other apprentice"* (p. 79). Thus, when members train members by utilizing apprenticeship, they learn from each other, and their core capabilities are evolving both for the *"super user"* that is the veteran and the newcomer. Through the legitimate access, the newcomer gets into periphery participation in 'Fablab Nordvest' and interpret the culture of making that integrates them in the context and what it means to learn (Lave & Wenger, 1999 pp. 78,

79). Alibrandi, (1977), cited in Lave & Wenger (1999) writes: “Veterans in AA who act as “sponsors” repeatedly withhold advice and guidance at some later stage; they hold back and wait until the newcomer is “ready” for the next step through increasing community participation” (p. 78). This is related to the extended courses as it is dangerous to provide a newcomer with advanced knowledge about the machines. However, it also reveals that the veterans hold the knowledge, and ‘Fablab Nordvest’ could be better at sharing via their servers and drivers since knowledge sharing among the members might create inequality and hierarchy as the veterans get to decide who will get the information needed. Instead, when it is accessible in the drivers or on a server, it is open to every member and thus more democratic.

***“What does the fab lab network provide?”***

At the Fabfoundation website, ‘What qualifies as a Fab Lab’ it says:

*“...The idea is that all the labs can share knowledge, designs, and collaborate across international borders. If I make something here in Boston and send you the files and documentation, you should be able to reproduce it there, fairly painlessly. If I walk into a Fab Lab in Russia, I should be able to do the same things that I can do in Nairobi, Cape Town, Delhi, Amsterdam, or Boston Fab Labs” (Fabfoundation, 2019).*

This entails that every Fablab shall have a minimum of machinery as a 3D printer, laser cutter, CNC-mill e.g., to enable the same production. Also, it implies that the sharing of designs and knowledge is essential in the production in a Fablab as one shall be able to share it across borders.

However, when the knowledge is *situated* in the veterans, it is not visible, democratic and not turned into a *standardized form* with the same frequency, as it would be on a driver or a server (Lave & Wenger, 2003, p. 78) (Star & Griesemer, 2015, p. 192).

***“Who can use a fab lab?”***

Since the concept of a Fablab is democratic, it is to provide public access to tools and personal expression. At the website, ‘What qualifies as a Fab Lab’, it

says: *“So a Fab Lab must be open to the public for free or in-kind service/barter at least part of the time each week, that’s essential”* (Fabfoundation, 2019).

However, ‘Fablab Nordvest’ takes 150 DKR per membership. Based on this, I argue that it is related to ‘Techshops’ fitness membership (Anderson, 2013 p. 18).

#### ***“What are your responsibilities?”***

In ‘Fablab Nordvest’, it is the veterans that know how to fix the machines; they do not have manuals or guides on how to fix them. However, they have to comply with the safety rules as Denmark has *Arbejdstilsynet* that makes sure that the physical and mental work environment is upheld, which is the reason why the members need to have a driver’s license in the machines.

#### ***“Who owns fab lab inventions?”***

I argue that ‘Fablab Nordvest’ cannot see the importance of using the drivers and servers for knowledge sharing even though their members make product ideas available to teach other members and newcomers.

#### ***“How can businesses use a fab lab?”***

As John mentions, it is okay to use the machines for small-scale production, but the intention is that the members shall start a production beyond ‘Fablab Nordvest’. An example of a project that has been prototyped and incubated in ‘Fablab Nordvest’ is ‘Audiocase’ that soon is launching on Kickstarter (Audiocase, 2019) (Appendix 5: Image: 5, AUDIOCASE). Since ‘Fablab Nordvest’ is not sharing knowledge via their drivers or servers and present themselves as being like ‘Techshop’ – only cheaper: I argue that Fablab Nordvest’ is a Makerspace wrapped in the Fab charters clothes since knowledge sharing, in particular, the democratization of the teaching citizens how to use the tools and machines, is essential in the Fab Lab foundation’s manifesto. At the Fab Foundation website, ‘What qualifies as a Fab Lab’, it says: *“... Fab Labs must participate in the larger, global Fab Lab network, that is, you can’t isolate yourself. This is about being part of a global, knowledge-sharing community”* (Fabfoundation, 2019). If ‘Fablab Nordvest’ wants to be a Fab Lab, they need to share knowledge via IT. However, ‘Fablab Nordvest’ is eminent in getting the youngsters interested in taking an *Erhvervsskoleuddannelse* as the

informal apprenticeship in 'Fablab Nordvest' enables the youngsters to get a foretaste and experience the learning system that utilized in an *Erhvervsskoleuddannelse*. Their collaboration and their presence in HKI enable them to help citizens into jobs, and people of marginalized groups get better opportunities in handling problems. By changing their mindset from a fixated to a growth mindset and getting them out of depression in the process of building physical tangible things via the *effort-driven reward circuit* they become part of the *shared repertoire* and the community (Wenger, 2000, p. 229)(Dweck, 2016, p. 38)(Lambert 2010 "pp. 93, 94) (Dougherty, 2016, pp. 144, 145).

#### **4.4. ORANGE MAKERS**

'Orange Makers' is located at *Penselstrøget 66* in the *Musicon* area in Roskilde right next to the Rock-museum *Ragnarock*. The Makerspace is made out of containers, as they are funded by 'AP Møller Mærsk support fond' together with the 'Makers corner' café which is a café made for people of marginalized groups (Appendix 15: Alex, 24:37). 'Makers corner' café wanted to be part of 'Orange Makers' big 5,000 square meter concrete hall but 'Makers Corner' café brought firefighters at the old hall who then closed the place and said that they were not allowed to bring more people in (Appendix 15: Alex, 47:43) (Appendix 5: images, 6: Stine's Figur 2).

This incident created a crisis, which pushed both initiatives to look for a new place and seek funding together. They got 6,8 million funding with 20 percent taxed by Roskilde municipality, who handles the administration, laws, and formalities (Appendix 15: Alex, 48:22, 48:27) (Appendix 29: Participatory Observations). They wrote a proposal so they could build the new 'Orange Makers' in the new hall that is 5 times smaller than the old place.

'Appendix 5: images, 7: New hall' shows a screenshot of the new hall named 'Hal 7' (Appendix 15: Alex, 47:23). It can be viewed in 3D at the bottom at the page here: (Orange Makers, 2019). As the goal is not to earn money from the Makerspace, they do not have a business model: "*There is no damn model at all. It's rock 'n roll*" (Appendix 15: Alex, 49:03). They get a small profit from the

materials and memberships, but that is used to cover incidents, for instance, stolen screwdrivers or new machines (Appendix 15: Alex, 48:52). The association 'Orange Makers' was founded in 2014 and has sprung out of 'the Roskilde festival' innovation unit 'Orange innovation', that started in 2013. 'Orange innovation' was a unit that used co-creation and created several projects such as the 'Made' festival (Appendix 15: Alex, 34:35, 18:39, 18:55) (Appendix 1: Definition of concepts, the Roskilde festival, Orange innovation, Made festival,) (Appendix 17: Orange makers vedtægter). Back when 'Orange Makers' was founded, they used to have a membership subscription named *Orange maker*, with the price of 50 DKR, including ten hours work per month (Appendix 6: Stine Broen Christensen's thesis, In the making, section 5. 'Præsentation af Orange Makerspace'). The membership was part of the Maker days, and the idea was to create a story-team, events for kids and build up the space (Orange Innovation, 2014).

The story team made a documentary where the idea was to document the 'Made festival'<sup>4</sup> held in 2014. At present, 'Orange Makers' still bear the mark of the 'Roskilde festival' and has a Klondike trashy style that is functioning as a frame for stuff making (Appendix 15: Alex, 1:04:49) (Appendix 16: Participatory observations, Orange Makers). However, they canceled the 'Orange Maker membership' since the members did not perform the tasks. Thus, the current membership costs 450 DKR pr. Quarters (Appendix 15: Alex, 01:50). The majority of their members are individuals, manly males, with interest in technology. The 3D printer, laser cutter, and CNC-mill are the most used machines (Appendix 15: Alex, 27:41). They have approximately 70 members and are open at any time of the day so you can come at 2 AM in the night and laser cut with others (Appendix 16: Participatory observations, Orange Makers) (Appendix 15: Alex, 28:34). The containers are heated and host different workshops in each of them, but they are creating a problem of exclusion when utilized by individuals. However, the small hall has enabled

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<sup>4</sup> Appendix 1: Definition of concepts.

them to create a community as they notice what each other is doing (Appendix 15: Alex, 43:10) (Appendix 16: Participatory observations, Orange Makers). The knowledge is shared via the members as Alex says: *“Some of what Fablab can do with sharing the recipes and something like that and we have tried some attempts in having a common Dropbox where people put something in but... it is not organized”* (Appendix 15: Alex, 42:30). In the same manner as ‘Fablab Nordvest’ it can create hierarchies of who has the most knowledge.

## **EVENTS**

‘Orange Makers’ hold a repair café once a month where they eat together, and they have *Makerdays*, which are days where newcomers can get an introduction to the machines. It is the members of the community that are catalysts for the *Makerdays* are being held and coordinate them. *Makerdays* are open workshops where group courses are held to give newcomers an introduction to the machines (Appendix 15: Alex, 27:09, 27:41, 30:50).

However, there is also the possibility of charming your way to a private-course, and if you are experienced in the laser cutter, 3D printer, or CNC Mill, you can skip the machine training. You do not need to use a chip to unlock and use the machine, but you must clean after yourself, and take your finished things home (Appendix 15: Alex, 30:50, 32:04). It is okay to sell what you have made and produce more of the items (Appendix 15: Alex, 31:58).

During the interview, I notice that Alex distance himself from the term *Maker*, so I asked him how he defines himself? Alex defines himself as a curious system-oriented office mouse as he likes to administrate, plan stuff, and seek funding (Appendix 15: Alex, 1:18:56, 1:29:18). When making something, he usually starts to plan how he shall go about a task as he says: *“Because first I have to sit and try to figure out the shit to not make mistakes. That might also be a little bit maker-ish”* (Appendix 15: Alex, 1:19:38). Alex has learned a lot from the laser cutter, as he says:

*“So I’ve really learned a lot by using the laser cutter because fuck one makes a lot of mistakes at first, I think. God, yes, it should be cut out there for it to actually look like*

*what it should be... I love that machine. But in every other [situation] I hate to saw a board wrong"* (Appendix 15: Alex, 1:19:46).

## **CONVERSATION WITH LITERATURE**

Alex is a good example of a member that is starting to develop a Maker Mindset as he is still at the stage where he is planning and making sure that he knows the steps and details before he starts. Thus, has he not reached the stage of "flow" or the "Dance of making" where his hands, mind, and body know what to do and start to work together (Korn, 2017, p. 51). His mindset is in the transition from a fixated mindset to a growth mindset, as it is boundary-breaking to start new projects; however, he is rewarded when he has made art as he says:

*"... Out here, there was some artwork on some walls that needed to be made, and I had bloody never thought that I could do that. So how the hell could I do that? But as with some of the tools I have from here. Oh, but that – I can do that. I hadn't dared to do that before, so it may be part of that with the curiosity, but also to learn to dare to do and try some things out. It's crazy the artists came over and showcased their projects. Like what man? I'm not an artist, so I just built fences with something, with some paint on and something like that. And it is also a very good example of what a Maker is, that it can empower in some way"* (Appendix 15: Alex, 1:28:27).

I argue that this is an excellent example of when what Lambert (2010) calls: "the effort-driven reward circuit" is activated (p. 93). Because when Alex' use his hands to make artwork, he is rewarded, as Lambert (2010) describes:

*"It's as if an electrical current is coursing through a network. When it's buzzing at top capacity –when, for example, installing that new light fixture requires both hands – the cells in those areas of the brain are turned on and secreting neuro-chemicals, such as dopamine and serotonin, which are involved in generating positive emotions"* (pp. 49, 50).

This is the reason why he gets so excited and wants to make, as it is not only his knowledge of how to go about making things that empower him; it is also his brain. Based on this I argue that the location of 'Makers corner' in the same hall as 'Orange Makers' might turn out to be a fruitful collaboration as it can help a marginalized group of people to get out of depression and be part of CoPs (Wenger, 2000, p. 229). During the *Makerdays*, there are groups of newcomers thought in the machines via apprenticeship, which enables them to learn and absorb what 'Orange Makers' is about (Lave & Wenger, 2003, p. 79). In the same manner as in 'Fablab Nordvest' the newcomers become part of the practice by playing, experimenting, making mistakes and getting into the growth mindset, the shared repertoire and the Maker Mindset (Lave & Wenger, 2003, p. 79) (Dougherty, 2016, pp. 144, 145).

## **CONCLUSION**

I have shown how members become part of the Maker Mindset, whether they are trained to use machines via Hacker ethics or if they are trained via an informal apprenticeship. In both pedagogical approaches, newcomers are *situated* in practice and become part of the *shared repertoire* as it is the practices and experiencing with the tools and machines that provide them with the Maker Mindset (Wenger, 2000, p. 229) (Dougherty, 2016, p. 144). I have shown how 'Fablab Nordvest' does not fit the requirements in the concept of a Fablab but how they help to get youngsters interested in taking an education. In the case of HKI and 'Makers Corner,' I have shown the socio-economic aspect of getting the socially deprived citizens into social learning systems that *situates* them in the initiatives communities. It illuminates how it can benefit from getting them out of depression and into jobs via the Maker Mindset. I have shown that there are different pedagogical approaches in the MMGC&R and that they would benefit from using IT to prevent hierarchies in their knowledge sharing. I will proceed by introducing you to the managers that are part of this narrative.

## 5. ROLES, AREAS OF RESPONSIBILITY & COORDINATION

In this section, I introduce the managers who will appear throughout this thesis. I will introduce the roles the different managers have, their areas of responsibility, and how they contribute to the practice landscape of MMGC&R (Wenger, 2004, p. 144). I continue by describing how they communicate with each other in the section: *'How the communication is shared & could be shared'*. You can find tables with initiatives and names in 'Appendix 8: Organizing analytically work' where I organize my analytical work in this section.

### ALEX // ORANGE MAKERS

Alex is a functionary office worker that sits and coordinates funding applications. He likes organized and order in things: he makes scripts at 'Praktisk.co' and 'Creating Maker Mindsets', which is an initiative that teaches kids in elementary school, youngsters in youth educations, and upper secondary school teachers about the digital formation and technological understanding. When Esben Danielsen is meeting with Alex, they communicate about 'Orange Maker' and the business they have together that is part of 'Orange Makers'. Through this, Esben Danielsen is teaching Alex what he knows. Alex exhibits his skill as a *Thought leader* when he creates concepts and frames the content for Praktisk.co or 'creating Maker Mindsets' (Wenger, 2000, p. 231). He is documenting the practice when updating 'Orange Makers' website and making teaching materials for 'Creating Maker Mindsets' (Wenger, 2000, p. 231). He also coordinates and *networks* so the press will come to the learning festival and 'Copenhagen Maker festival' <sup>5</sup>for interviews. Also, Alex is part of 'The association Maker' (Wenger, 2000, p. 231).

### ESBEN DANIELSEN // ORANGE MAKERS

The admired role of Esben Danelsen as a *Thought leader* is illustrated in the picture 'Appendix 5: images, 8: Esben Danielsen viewed from behind' that

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<sup>5</sup> Appendix 1: Definition of concepts.

signifies that there is a godlike, patron feeling about Esben Danielsen as he has been part of creating the 'Roskilde festival' and has started 'Orange innovation' (Wenger, 2000, p. 231). He is perceived as one of the *Pioneers*, and several of the members find him very talented to the extent that they get *starstruck* when they meet him (Wenger, 2000, p. 231). Esben Danielsen uses his network to facilitate collaborations between initiatives: 'Orange Makers', 'Roskilde festival', and Roskilde municipality. He developed his contacts with Roskilde municipality and the state through working at the 'Roskilde festival'. He teaches Alex how to coordinate, as he is proficient in doing business-related activities.

### **THOMAS // ORANGE MAKERS**

I have only spoken to Thomas once, but he seems to be very interesting. He documents the practice and networks when taking interviews and teaches kids and youngsters how to use the tools in 'Orange Makers' by, for instance, building kites, go-carts, jewelry, e.g. (Wenger, 2000, p. 231) (sn.dk, 2018).

### **JOHN // FABLAB NORDVEST**

John is a *Community coordinator* that works globally as well as locally. He is terrible at saying no to projects, as he is very interested in what is happening globally as well as locally. Globally, he stays at the borders as a *boundary spanner* of 'Fablab Nordvest' and network (Wenger, 2000, p. 235). An example of John's work is the collaboration with 'Fablab Nordvest' in the bus-advertisement-monitors to make a Campblaster with the female singer Anya and her friend Olivia Joof (Appendix 5: images, 9: John, Campblaster with Anya and Olivia Joof) (Soundvenue and Movia, 2018). Besides the work he does in 'Fablab Nordvest', he is also the *pioneer* in creating the first Fablab in Denmark 'Fablab Danmark'. Currently, he is working as an Innovation consultant in *Dansk Industri* and has his finger on the pulse with the sustainability issue in the Danish plastic industry. It is through this position that he carries knowledge and contacts to function as a *Thought leader* (Wenger, 2000, p. 231). This is evident in the case of *Smedtoften*, where he not only has been the *pioneer* in creating a collaboration with Copenhagen

municipality: *Teknik- og miljøforvaltningen* TMF, *Børne- og Ungdomsforvaltningen* BUF and *Kultur og fritidsforvaltningen* KUFF on a Velux funded project: *Constructive communities for vulnerable young people*. He has also coordinated a project where *they* educate the youngsters and citizens on how to reuse plastics. The target group of this project is youngsters that have turned eighteen and have not yet started an education. The project enables youngsters that have turned eighteen and not started an education to gain an interest in taking a *Next erhvervsuddannelse* through projects based on informal apprenticeship (Lave & Wenger, 1999, 232). Locally, he is the manager that looks over the shoulders of the members, like Leonard. In a way, he likes to control and to make sure that everything is going as planned. Even though John is not the treasurer in 'Fablab Nordvest,' he is the one that collects the money. This can create some tensions with, for instance, the 'Copenhagen Maker Festival', as he does not like acting tough when he feels like he has to.

### **LEONARD // FABLAB NORDVEST**

Leonard is a *catalyst* in getting the idea of the KSBT. Nonetheless, Leonard works locally and is taking care of the core operation of 'Fablab Nordvest' by coordinating who will take which shifts, set up exhibitions, make open houses, hold speeches and connect people to the ones that can help them. His *pioneer* skills are illustrated in his work as a manager in HKI, where he integrates 'Fablab Nordvest' in HKI by aligning projects between the two (Wenger, 2000, p. 231). His *Community coordinator* abilities are demonstrated in his eminent educator skills: being the veteran, facilitator, and mediator that takes time to teach newcomers. He explains, facilitates, draws by hand, and in 3D in the CAD<sup>6</sup> program 'Solidworks' (Wenger, 2000, p. 231). Leonard can only work with one thing at a time, which makes John feel stressful from time to time. Nevertheless, he is effective in getting things ready for exhibitions and events.

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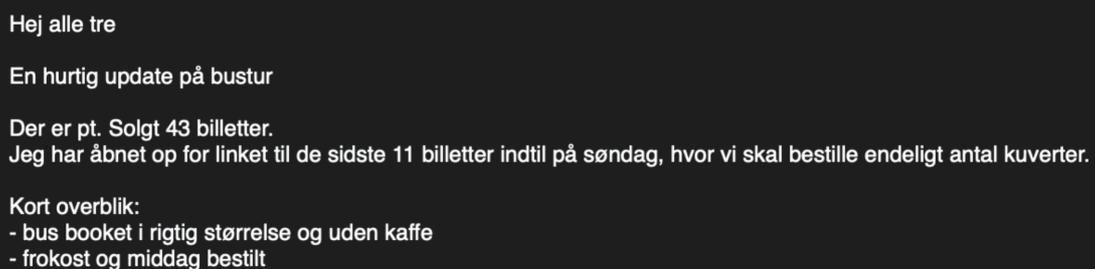
<sup>6</sup> Computer-aided design

## MARTIN // LABITAT

Martin is good at *documenting the practice* in 'Labitat' by writing recipes of how projects have been tried out and how new projects should be created on 'Labitat's' Wiki (Wenger, 2000, p. 231). He takes part in coordinating when 'Labitat' participates in projects and events, and he *networks* with the others by, for instance giving interviews and being part of setting up the Copenhagen Maker Festival (Wenger, 2000, p. 231). He is located as a member at 'Underbroen' and 'Betalab' and carries knowledge between the three initiatives as an *Outpost* (Wenger, 2000, p. 235).

## CHRIS - "THE MAKER MAMA" // UNDERBROEN

Chris calls herself a *Maker Mama* for a good reason, as she is the one that knows everything (Appendix 29: Participatory Observations). She is good at coordinating. An example of this is an email she sent during the KSBT, where she took the responsibility of making the event in 'Billetter'. From accomplishing this task, Chris gained knowledge about how many participants we had, how many tickets were sold, how to make codes for the initiatives to buy tickets and how to write an invitation together with David. During the process, she sent out two emails to all of the initiatives: One with updates about that the date was moved and the other one in regards to the opening of ticket sale, ordering food and bus while making sure that it matched the budget, she had made herself before. The mail below shows that Chris has an overview of the ongoing communication in KSBT and that we were home safe with the KSBT. I will return to this point again later in this chapter.



Hej alle tre  
En hurtig update på bustur  
Der er pt. Solgt 43 billetter.  
Jeg har åbnet op for linket til de sidste 11 billetter indtil på søndag, hvor vi skal bestille endeligt antal kuverter.  
Kort overblik:  
- bus booket i rigtig størrelse og uden kaffe  
- frokost og middag bestilt

The connotation of the name indicates that Chris likes to embrace and please everyone. She is good at giving positive feedback and is contentious and busy

which can be illustrated by when she had forgotten to call bus companies during our coordination of the KSBT.

*“Well then here I have the first bad conscience. It's that I had forgotten that I should do it. I have tried to do it today, but there are no bus companies that are open, but I promise I will do it on Monday ...I am really sorry a month has past” (Chris, 02:23, 02:44 meeting 19.01.2019).*

As the quotation shows, she is taking too much responsibility and bad at distributing tasks to the other members in the movement. An example is when the exhibitors at the Copenhagen Maker Festival have not checked their email and are asking Chris where their exhibition should be placed, she often tells them what to do, instead of pushing the responsibility back to the exhibitors and ask them to check their email where the information was in fact indicated. Another example was when Leonard did not manage to order food, she offered to do it instead of provided him with info about catering company and let him work with it. That is why it is important for us to ask if Chris needs help and this is also the reason why I help her at the ‘Copenhagen Maker Festival’ because if Chris goes down with stress there is a lot of tacit knowledge that are missing.

Her *patron* skills become clear in the case of the Fablab ‘Underbroen’ which she has been part of initiating as well as ‘The association Maker’ (Wenger, 2000, p. 231). At ‘Underbroen’ she cleans up after the Makers and are the one together with David that initiate events as for instance ‘Maker meet ups’ as Chris and David’s salary comes from EU funded projects (Appendix 18: Martin Tilsted, Teknik- og miljøforvaltningen i Københavns kommune) (Appendix 29: Participatory Observations). An example of this is the ‘Responsible design market’ (Appendix 5: images, 10: Responsible design market 2019). However, as Chris is too responsible and is part of the creating the gatherings in the MMGC&R I argue that she becomes a *center* in the MMGC&R so we are centralized somehow and that this could be prevented

by for stance creating an intranet with her tacit knowledge of where to find the things she as the only person knows.

## **DAVID // UNDERBROEN**

David tries to be the one who can speak to everyone, which enables him to make many contacts and *network*. An example of this is where 'Underbroen' works together with Copenhagen Municipality, *Teknisk- og miljøforvaltningen* in a Circular economy project in reducing waste and reusing plastics together with Precious plastics.

*"... Then we should make this EU application and it was very obvious that since we had someone that was located in the center of Copenhagen who knew this, we invited them to a meeting. ... In addition to the fact that it is very interesting that they lie where they do, "Underbroen" just knows so many within the Maker Movement"* (Martin Tilsted, Project manager, *Teknik og miljøforvaltningen*).

Besides being an intern at Orange innovation David has worked at BetaLab and runs 'Underbroen'. He is a Community & General Manager at 'Underbroen' and a project manager at 'Copenhagen Maker festival'<sup>7</sup>. He is part of 'The association Maker'. David is Chris' right hand and he is very good at relieving the pressure of Chris shoulders by for instance doing some of her tasks while being efficient in finishing them. He is positive, fun and gives Chris positive feedback when she has finished a task.

## **RENÉ // PRAKTISK.CO**

René has been working with communication and PR at the Copenhagen Maker Festival. She is part of 'The association Maker' and a *pioneer* in that. She is working for creating better technological education in schools, youth educations and gymnasiums in 'Creating Maker Mindsets' where she makes

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<sup>7</sup> Appendix 1: Definition of concepts, 'Copenhagen Maker Festival'

the Learning festival. She is a *Thought leader* and a *networker* in her work together with Alex in Prakisk.co where she is the one that hires educators, facilitators and presenters and takes meetings with different interests. She is *documenting the practice* when making teaching material to workshops and instructions with Alex.

## **HOW THE COMMUNICATION IS SHARED & COULD BE SHARED**

Part of the Maker Mindset is to share knowledge and the initiatives are curious to find out what each other are doing (Dougherty, 2016, pp. 143,144). However, at this moment when writing this thesis, the managers are creating clusters based on where they stem from in the MMGC&R (Appendix 8: Organizing analytically work). This is evident in 'The association Makers' that are part of 'Creating Maker Mindsets' <sup>8</sup>founded by Chris, David, René and Alex (Appendix 1: Definition of concepts, 'The association Maker' and 'Creating Maker Mindsets'). Or Chris and David that are managing 'Underbroen' or René and Alex that have created Praktisk.co. Each of them has had Esben Danielsen as their manager in Orange innovation so they are using the methods that Esben have taught them. This is illustrated in when Chris at the end of the knowledge sharing bus trip said: "*We should make more of what Esben Danielsen calls Kissing meetings<sup>9</sup> so people can socialize more*" (Appendix 29: Participatory Observations, KSBT). Thus, the communication and the *networking* are fixated in the clusters and invisible for the other initiatives. Other initiatives have no knowledge about how competent they are, which result in difficulties of sharing information and gaining new experiences internally (Wenger, 2004, 2000 pp. 14, 239, 289). This means the *thought leaders'* ways of thinking are only based on the initiatives that they participate in and the enterprises that they value as competent (Wenger, 2004,

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<sup>9</sup> Kissing meetings connotes that the initiatives should meet and make an assessment of each other by socializing more often to eventually be fond of each other.

2000 pp. 14, 239). The managers who document the practice are only documenting their own practices and the pioneers are clustering where they instead could be divided and explore new sites (Wenger, 2000 p. 239). When John networks and stays at the borders as a *boundary spanner* of 'Fablab Nordvest' he is able to increase the frequency of external communication for 'Fablab Nordvest' (Wenger, 2000, p. 235). However, 'Fablab Nordvest' is not participating in exchanging knowledge with the other initiatives, which could have enabled them to stay up to date with the *processes* and the *shared responsibility* (Wenger, 2000, p. 236). When Martin travels as an *Outpost* between 'Labitat' to 'Underbroen' or 'Betabolab' he carries messages of for instance which events 'Labitat' have attended as Aarhus Maker Fair and which knowledge he and 'Labitat' gained from participating in the events. If the communication keeps being fixated, the initiatives will eventually grow apart in their identification of each other. This also pulls apart the strings of the *periphery* and the *shared repertoire, shared processes, alignment* and *shared responsibility*. This can create a hierarchy of who has the most knowledge about the initiatives but the knowledge will be manipulated, as some knowledge might be hold back for some managers. Justified by members of CoPs "*hate each other, and they love each other; they agree, and they disagree*" and the articulation through *broker's* mouths will create a partial framing of the knowledge (Wenger, 2004, 2000 p. 16, 235). Instead, communication could be fluent if the intranet I mentioned earlier was created since the managers need a forum where communication becomes visual. This could enable them to gain new experiences and also competencies that constitute the MMGC&R. This would enable the initiatives to document their different approaches, which would result in a better coordination without compromising their perspectives (Wenger, 2004, p. 128). Thus, the intranet would have *coincident boundaries* and enable the documentation of the MMGC&R (Star & Griesemer, 2015, p. 191). I have explained how the communication is exchanged and I will continue by describing at which events the MMGC&R gather and how the coordination of the KSBT took place.

## **EVENTS: WHERE WE GATHER**

In the MMGC&R there are several external events where we gather during a year: Copenhagen Maker Festival, Praktisk.co and 'Creating Maker Mindsets'. Each of them can be found in Appendix 1: Definition of concepts, Events. Below I will describe how an internal event was made, as there had not been one since the Made festival in 2014.

## **THE COORDINATION OF THE KSBT - TOUR DE LABS**

At the Copenhagen Maker Festival 2018 Leonard had come up with the idea of making a KSBT for the MMGC&R as he thought it was about time that the initiatives saw how each other worked *"Shouldn't we take a tour? - All of us. ... Between the Labs?"* (Appendix 19: What is a Maker?, Leonard, 32:32, 32:35). Leonard said while him, Michael, and I were sitting and talking about what a Maker was over a few beers at the tables inside KPH Volume after Copenhagen Maker Festival had closed. The idea of creating knowledge sharing between the different initiatives had come from several members, such as Casper, John and mines during the last couple of years. However, no one knew how to go about it. (Appendix 5: images, 12: 1st Prototype of the Knowledge sharing bus trip). At this point David had just joined the conversation. Leonard immediately asked him if he wanted to participate in the coordination of the bus-trip. *"Yes with pleasure"* (Appendix 19: what is a maker?, David, 32:35) I lent Leonard my paper and pencil and quickly he scribbled the names while he was describing the idea. *"We will crash Roskilde, Casper [FabLab RUC], hook us up and then we will crash the lab there [pointed his finger to Fablab TI] and then we will drive on."* Said Michael after Leonard had written the names of the initiatives down. Suddenly, the paper was no longer just a piece of paper functioning as an artifact - now it was an *ideal type*: A center, transformed into a frame that facilitated the communication of a KSBT as the meanings became visual in the reification process on the paper (Star & Griesemer, 2015, p. 191). We used gestures to illustrate messages on the paper to highlight the point that we found important for the KSBT (Lambert, 2010, p. 101). It enabled coordination between Leonard, David, Michael and I, as

each of us did not have to compromise our hinterlands and initiatives: 'Fablab Nordvest', 'Underbroen' and 'Copenhagen Fablab' in the coordinating process (Wenger, 2004, p. 127).

## **WHY THE KSBT WAS IMPORTANT**

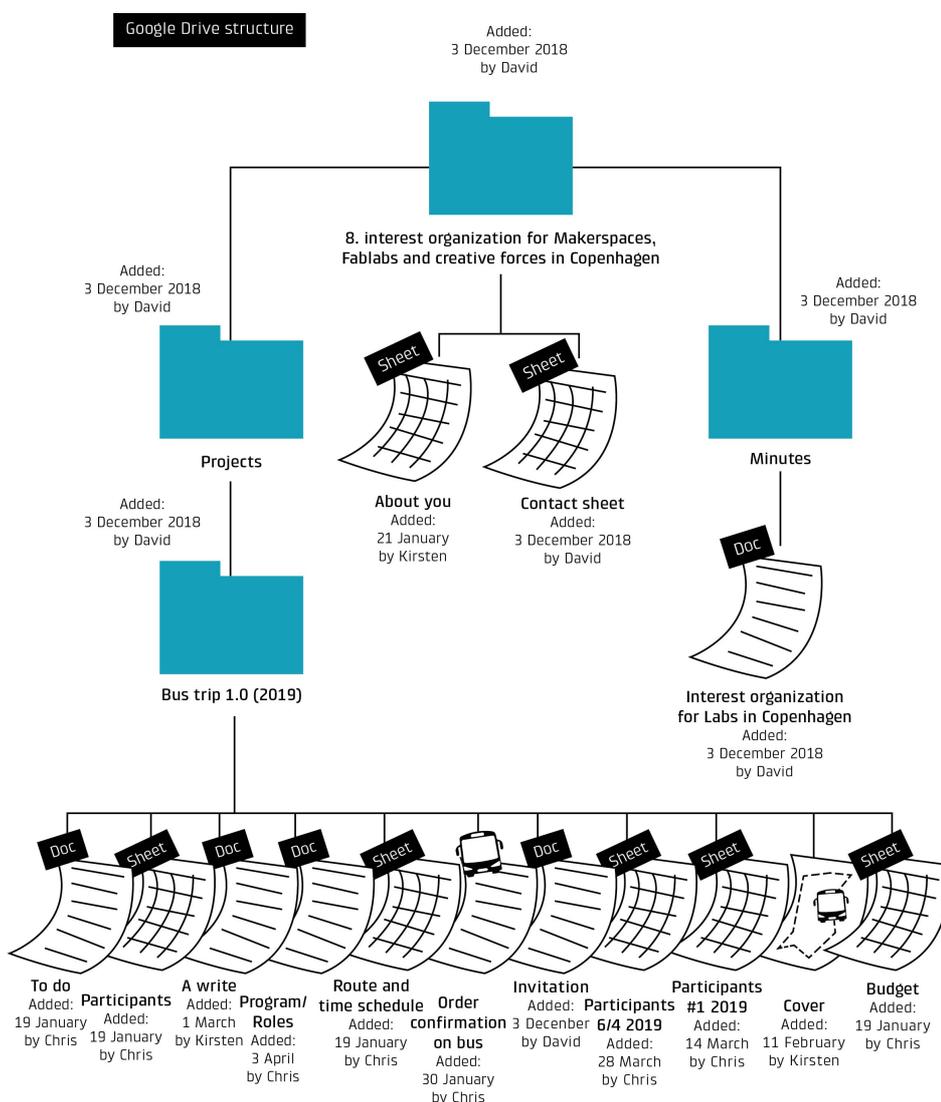
The KSBT was made by Chris, David, Leonard and I, as there had been no internal gathering for the MMGC&R since 2014 where each of the initiatives had met for the first time at the 'Made festival'. The initiatives had since then created their own *business models* based on the different kind of funding that each of them has received from for instance, *Slots- og kultur ministeriet* in making festivals and new initiatives as 'Underbroen' to operating the initiatives (cphsolutionslab.dk, 2019) (Appendix 18: Martin Tilsted, Teknik- og Miljøforvaltningen i Københavns kommune). I was aware that the initiatives had reached a size where it was important for them to see what each other were doing as they are created out of learning and needs to challenge their own understanding of their competencies by looking at the others' approaches (Wenger, 2004, p. 289). During the interview with Martin from 'Labitat' I noticed that he articulated a Fablab as the other when I asked what the difference between a Hackerspace and a Fablab was; he expressed: "At one point, we described a Hackerspace as the place you go when your Fablab is broken because we were in the Fablab in *Valby* there and repairing a 3D-printer or something. Then we kind of joked about that there was a hierarchy there" (Appendix 9: Martin, 43:13). He described 'Labitat' as the ones who had the control of the process and thus 'Labitat's' politics and way of doing the things were the right ones. In othering there is a hierarchical relationship. The self-other distinction that characterizes sophisticated othering played a role in 'Labitat' being a Hackerspace and 'Copenhagen Fablab' being a Fablab. However, there is a hidden argument in the undesirable characteristic that 'Labitat' should repair 'Copenhagen Fablab's' 3D printer when it broke as 'Copenhagen Fablab' should know how to repair their equipment which is the crude othering (Brons, 2015, p. 70). Reasoned by, part of 'Labitat's' pedagogic method is based on Hacker ethics where they

teach newcomers how to repair and hack their machines in relation to the hands-on imperative, and what John Dewey wrote, "*Learn to do by knowing and to know by doing*" (Held, 2014) (Levy, 2010, p. 28). So, when 'Copenhagen Fablab's' 3D printer breaks and they cannot find out how to fix it, Labitat do not see it as competent in relation to their initiative pedagogics (Wenger, 2004, p. 14). However, Martin describes it as apparent reasonableness that by fixing the 3D printer it made the distinction and hierarchy (Brons, 2015, p. 71). But to say that fixing a 3D printer result in a difference between a Hackerspace and a Fablab cannot be justified and thus it was a crude othering since it did not have a welcoming conclusion (Brons, 2015, p. 71). Thus, it was important to dampen the othering. Chris, David and Leonard had articulated that they see each other as colleagues (Meeting, 29.11.2018, 05:17). However, during the 'Copenhagen Maker Festival' 2018 I was interviewing two of the managers from two of the first Fablabs in Denmark. One is 'Copenhagen Fablab' started in January 2013, located at *Valby kulturhus* (Kultur Valby, 2013). It is a Fablab that is backed by Copenhagen municipality as part of a library. The other one is 'Fablab Nordvest', Leonard is originally from 'Fablab Denmark' that opened in 2012 and present 'Fablab Nordvest' that is funded by HKI and financed by memberships and courses. The interview started by me sitting and having a conversation about making a KSBT with the manager, Leonard from 'Fablab Nordvest' and then came Michael the manager from 'Copenhagen Fablab' and placed him on my side of the table. I noticed that they started to talk over each other and were stealing each other sentences so I asked if it was okay to record and then I asked what a Maker was. In this part the competition is in focus so please notice the time from the interview. While Michael started to explain his approach, Leonard went up to get beers:

*"... within the Maker Movement for me is what really sets it apart if you don't have to glue feathers on eggs and so on what else we've been doing in the culture house for tens of thousands of years or turning ashtrays for the whole family or dish mats with nails sticking out everywhere above everything"* (Michael, What is a maker, 03:50).

When Leonard came back he approached the conversation by interrupting Michael “*One should remember that that maker ...*” (Leonard, What is a maker, 04:09) Michael continued the conversation by acting as if he did not hear what Leonard said: “*So the digital aspect is actually quite important and it doesn't come ...*” (Michael, What is a maker, 04:09). Leonard interrupted Michael and said: “*Maker comes out of ...*” (Leonard, What is a maker, 04:11). “*And it doesn't only come out of Make Magazine*” (Michael, What is a maker, 04:13) said Michael and talked over Leonard as if it were a play of chess as Leonard would have taken the role as a not being part of the *joint enterprise*, the *mutuality* and the *shared repertoire* by disagreeing with Michael on his facts which resulted in Leonard saying: “*No*” (Appendix 19: What is a maker?, 04:16) (Wenger, 2000, p. 229). Michael did not allow him into the conversation, as Michel was not interested in letting Leonard take the lead of the conversation. He was non-authenticating Leonard by not giving him room for speaking (Bossen & Lauritsen, 2012, p. 145). Based on this I argue that Leonard and Michael was competing since Leonard had lost the battle by not getting room for speaking and being manipulated in Michael's enactment that was articulated so Leonard would be seen as not having a more competent knowledge than Michael (Wenger, 2004, 2000 p. 14, 239) (Mol, 2002, pp. 5, 13, 14, 15). The articulations, *othering* and competitions show why the KSBT was crucial at this point, as CoPs start to become fixated and thus choose stops people from different communities to learn from each other (Wenger, 2000, p. 230). We chose to only include the managers in the KSBT, as we needed some ones with decision power. An A-team or ambassadors that could take it to the next step of making a trade association that could be part of the political agenda by for instance seeking money together and buying materials together and creating a trade association for the MMGC&R (Appendix 21: Meeting 19 January 2019 Chris, 16:38)(Meeting, 29.11.2018, Me, 08:56). This approach would enable the initiatives to speak openly about the obstacles and hinderings that they found difficult to manage or fix during their everyday practice (Wenger, 2004, p. 136). On the contrary, if the bus trip had been a mix

of managers and members of the MMGC&R; the managers would held information about their obstacles in their practices back as they would have had an interest in getting new members and the outcome of the KSBT would have been another (Wenger, 2004, p. 136). The coordination took place during nine meetings held the 29 November 2018 at 'Fablab Nordvest', 19 January 2019 via Skype, 25 January 2019 at 'Underbroen', 9 February 2019 via Skype, 3 March 2019 via Skype, 4 March 2019 via Skype, 11 March 2019 via Skype, 17 March 2019 via Skype, 3 April 2019 via Skype.



The image above shows the structure of the documents and who added them.

## FIRST EMAIL STRING: DATES FOR TAKING OVER WORLD DOMINATION & BEER

David enacted the first email string with the purpose of finding a date where all of us could participate.

Hej alle,

Jeg kommer her med 3 datoer som passe mig ift. mødet om en fablab tour de chambre. Jeg glæder mig allerede.

Onsdag d. 28/11 mellem 18-20  
Torsdag d. 29/11 mellem kl. 15-17  
Mandag d. 03/12 mellem 15-18

Hvad siger I til de datoer/tidspunkter?

God aften

The first meeting was held the 29 November 2018 at 'Fablab Nordvest'. There was a lot of energy and looking back on my notes from this meeting we were centered on *"knowledge sharing"* as the purpose of the trip but it was about finding out practicalities about what internal means and how we should go about making the trip. Did internal also include members? Or Managers? Which initiatives? And how far are we going? Is it only for the initiatives located in Copenhagen or is for 'Orange Makers' and 'Fablab RUC' at Roskilde as well? There were plenty of visions about what we could do. Five minutes into the meeting we found out that we would rent a bus and narrow it to only for the managers also because it would be easy to get participants *"Yes, down here, there are eight of us on the board"* said Leonard, 04:03. *"We could probably also provide ten"* said Chris, 04:15,. We decided that it should be the 23 February 2019 (Appendix 21: Meeting 19 January 2019)(Appendix 20: Meeting 29.11.2018). A Google drive folder structure was created and added by David consisting of 3 folders - '8 Interest organization for Makerspaces, Fablabs and creative forces in Copenhagen', 'Projects' and 'Minutes'. The folder 'Bus trip 1.0' was placed under the folder Projects with a document with an invitation was starting to take form. A document was placed under 'Minutes' named 'Interest organization for Labs in Copenhagen' consisting of a vision about creating that umbrella organization (Wenger, 2004, p. 280). Each of us knows how to use Google drive to create a structure that we then place the documents in, as it is normally here that we place the documents that our

coordinating processes go through. Google's documents are quite similar to word documents, they function as *Standardized forms* that are agile understood, as the versions are transparent in the history thereby one can see the eyes that have been looking at an object, and manipulated it inside the enactment through Google's lenses and made changes to it with the purpose of creating an alignment (Star & Griesemer, 2015, p. 192)(Wenger, 2000, p. 228). Some documents are more important than others as for instance the 'Contact sheet'. I will return to this document during this narrative.

	A	B	C	D	E	F	G	H	I	J	K
1				Sted	Kontaktperson(er)	Antal pladser	Rolle/funktion	Telefon	Mail	Hvem tager den?	Tilmeldte
2	rækkefølge	tid				69					
3					Liam						
4	slut	18:00-?	K	Underbroen (Maker)	David Chris	5		XX XX XX XX XX XX XX XX		David & Chris	Participating with 2
5		5 13:15-13:45	SV	BetaFactory	Simon	5	CEO BetaLab, BetaFactory og BetaMachines	XX XX XX XX			BetaLab is in
6					William		CEO BetaLab, BetaFactory og BetaMachines	XX XX XX XX		David & Chris	I got a hold of William and he is signing the ones from BetaFactory up.
7					Anders Dahl Valdemar Kenneth Weiss		Produktionsansvarlig BetaLab	XX XX XX XX			
8		6 14:00-14:30	SV	Copenhagen Fablab	Rasmus Fangel	5	Leder	XX XX XX XX		OK (Chris)	Michael is in. Send the invitation to Michael and he will find out who will go on the trip. They will probably not be 6 I ran the list. And got a hold of a Nicks answeringmachine. I have written Michael at FB
9											
10		10 17:00-17:30	K	Illutron	Casper	5	Stifter?	XX XX XX XX		Chris	Casper will send mail to the responsible Casper is not participating due to winterbreak. Jesper is on it. I have called him
11											
12		7 14:45-15:15	FRB	Labitat	Martin Walter	5	Medlem Medlem	XX XX XX XX XX XX XX XX		Kirsten	They are participating with 6 and would like an extra to come.
13											
14		3 11:15-11:45	ROSKILDE	Fablab RUC	Casper	5	Manager	XX XX XX XX		Chris	Casper is not participating due to winterbreak. Jesper is on it. I have called him

The second meeting was held on 19 January 2019 via Skype. David asked if I could write my contacts on the participants from 'Fablab TI': "... So this is also a very nice mailing list to use in the future. We will, for example, use it for some of this EU hubbub; to write around for this whole list to spare or anything else so it's nice". (Appendix 21: Meeting 19 January 2019, David, 13:00). One object is the enactment of putting your contacts on the sheet with the purpose of creating an aggregation of contacts in a list that we could use for mailing people and calling people. The document had *Coincident boundaries* as each of us could access it and work autonomously by using the information, adding new ones and get an overview from each of our different sites (Star & Griesemer, 2015 p. 191). The labeling of the documents enable a reification so the documents can function as fixing points for the negotiation of the meninges that us as the participants have (Wenger, 2004, p. 74). An example of this was when I asked

if we should make a field in the Contact sheet: *"I'm actually thinking that in here in the contact sheet, maybe we should just write who takes it? So because it is not okay if you have to take many David and I can also take some of them"* (Appendix 21: Meeting 19 January 2019, Me, 30:00). David responded *"Kirsten, That's a great idea"* (Appendix 21: Meeting 19 January 2019, David, 30:15). Leonard asked: *"What are you saying?"* (Appendix 21: Meeting 19 January 2019, David, 30:19). David answered, *"Who's talking to who and what, we actually need that"* (Appendix 21: Meeting 19 January 2019, 30:20). *"But hadn't you noted who there was spoken to? No. Nah"* (Appendix 21: Meeting 19 January 2019, Leonard, 30:23). *"So I have written those who have signed up. Made a column in here that is named 'Sign ups' but then we might make one that is called: 'Who takes it'? - So I will just do that"* (Appendix 21: Meeting 19 January 2019, Me, 30:26). *"I'm just starting to go in and do it now – at least where I know"* (Appendix 21: Meeting 19 January 2019, David, 30:40).

Hvem tager den?	Tilmeldte	2
	Participating with 6	
David & Chris	Participating with 2	
David & Chris	BetaLab is in I got a hold of William and he is signing the ones from BataFactory up.	
OK (Chris)	Michael is in. Send the invitation to Michael and he will find out who will go on the trip. They will probably not be 6 I ran the tlf. Nr. And got a hold of a Nicks answeringmachine. I have written Michael at FB	
Chris	Casper will send mail to the responsible Casper is not participating due to winterbreak. Jesper is on it. I have called him	

A second object in the contact sheet is to get an overview of the initiatives in the contact sheet that were participating; if they were participating with how many tickets that then could be compared to the budget and the bus order. David had made the content in the invitation; Chris had in 'Billetter' made unique codes so each initiative had five seats. In that way we could keep track of how many seats the initiatives had ordered and that they could not order more than five in the first round. I had woven the email addresses of the initiatives together with the unique codes and sent out the invitation to each of the initiatives.

Vi vil gerne se jer til en vidensdelings- og socialiserings-bustur (Tour de Labs). I første omgang for fablabs, makerspaces og hackerspaces i Storkøbenhavn og Roskilde.

#### Planen for dagen

Vi kører rundt til de forskellige labs, ser hvordan hinanden arbejder og hinandens faciliteter. Hvert stop er 30 minutter. Under busturen får hvert sted mulighed for at give en kort introduktion til det respektive sted. Vi snakker, skåler og nyder hinandens selskab. Når busturen er slut ender vi i Underbroen til en bid mad og lidt til ganen.

Vi har sørget for snacks, frokost, kaffe og aftensmad til os, og selvfølgelig også drikkevarer (øl, vand og vin).

#### Hvornår, hvor og hvad?

*Dato og tidspunkt:* Den 23. Februar fra 9-19 (Bussen kører 09.00).

*Mødested:* Underbroen, Christians Brygge 31, 1219 Kbh K.

*Deltagere:* Hvert værksted har 5 pladser i bussen. Eventuelle tiloversblevne pladser vil blive fordelt hos dem der vil have ekstra med, eller tilbudt til andre. Det er jeres opgave at udfylde pladserne.

**Pris:** 400,00 kr. inkl. moms pr. deltager

Deadline for køb af billetter (Billetter-salg lukker) er **fredag d. 8. Februar 2019**

#### Hvad gør I nu?

Har du modtaget denne invitation som den første, er det dig der er kontaktperson for jeres værksted. I fordeler selv billetterne og køber dem via billetter (<https://bit.ly/2WnV0b4>). I skal bruge følgende kode for at få adgang til billetterne: ujoyis.

Fuldt program med stop følger snarest!

After I had sent the Email, Chris came with an update the 6 February and wrote that we only had sold eight tickets, five from 'Labitat', two from Chris and David and one from me to the bus trip so we needed to take action. I had called the managers.

Jeg håber i har det godt.

Der er kun solgt 8 billetter til busturen pt.

Det er 5 stk fra Labitat , Asger og jeg fra Underbroen og så Kirsten der har købt.

Hvis vi ikke skal ende med at aflyse og udskyde skal der rykkes inden weekenden!

Vil i ikke give en tilbagemelding på hvem i tager fat på, så vi kan fordele kontaktpersonerne mellem os og give dem en reminder - enten pr. Mail eller via tlf.

En generel reminder (alle-mail) i morgen kunne også være fed, så kan vi følge op personligt over telefonen.

Hvad synes i?

Kh

After the email was sent out, Leonard wrote:

Hey  
Jeg mangler at købe 5 stk det får jeg gjort i morgen.  
God idé med en reminder pr. Mail i morgen og evt tlf. Sig til hvis og hvem jeg skal tage fat i.

Leonard was not participating in the shared responsibility how come that was? Is there a normative understanding of that Chris and David would take care of it as they normally do at the Copenhagen Maker Festival? Where was the boundary in the coordination process? At this moment I did not have time to analyze on that, as we needed participants. I thought that the reason why the managers were not buying tickets was because we used the wrong communication channel so I decided to call all of the initiatives to get knowledge about how come they were not buying the tickets? A third object is to use the contact sheet to get people to participate by calling them via their phone numbers and ask them why they did not act on the email? This provided me with information about a fourth object that managers articulated that they had difficulties in finding out how to use the codes (Mol, 2002, pp. 5, 13–15). So, I helped them:

Hi Marshall  
I have sent two codes to Casper: One for illutron and one for Fablab RUC. The code you need to use for illutron after clicking on the [bit.ly](#) link is: ujoyis.  
Hope it helps you?

A fifth object is to ask why they are not buying tickets? And then list the findings in the contact sheet and use it to modify the coordination process by finding out that a sixth object was that a several of the members articulated that they could not make it on such short notice and thus gain knowledge about how many managers that approximately would participate (Mol, 2002, pp. 5, 13–15). A seventh object was that several of the participants articulated that they did not speak Danish and thus did not get the message (Mol, 2002, pp. 5, 13–15). For instance, when I spoke to Logan from 'Space 10' via phone he said that he had received the email but it was in Danish and as he was from France, he could not understand the content. This resulted in me enacting an eight object: An English version of the email that was sent to the initiatives. I made it a rule that when we sent out emails to the initiatives it

should be in both Danish and English so when we decided to move the trip to the 6 April I sent out the invitation in English and Danish (Appendix 22: Memo meeting 9 February 2019) (Mol, 2002, pp. 5, 13–15). ‘BioTeket’ and ‘CPH music Makerspace’ were not buying any tickets because a ninth object is to find out that some of the initiatives have financial problems due to them not receiving enough funding so they do not get a salary and thus cannot buy tickets (Mol, 2002, pp. 5, 13–15). Last, was to find out that there exists a tenth object, which is a mailing culture in the MMGC&R as they everyday receive many emails and they much rather will spend their time on making and hacking (Mol, 2002, pp. 5, 13–15). Now, I had mapped the objects and the different multiply realities (Mol, 2002, pp. 5, 29–33, 44, 45). I could get them to *coincide* by placing them in the contact sheet with *coincident boundaries* under a new label named ‘*Tilmeldte*’ next to ‘*Who takes it*’ (Mol, 2002, pp. 5, 46).

Tilmeldte
Participating with 6
Participating with 2
BetaLab is in
I got a hold of William and he is signing the ones from BataFactory up.
Michael is in. Send the invitation to Michael and he will find out who will go on the trip.
They will probably not be 6
I ran the tlf. Nr. And got a hold of a Nicks anawerfingmachine. I have written Michael at FB
Casper will send mail to the responsible
Casper is not participating due to winterbreak. Jesper is on it. I have called him
They are participating with 6 and would like an extra to come.
Casper is not participating due to winterbreak. Jesper is on it. I have called him
They are in. Send invitation to Alex and they will find out who will participate.
Probably the bord (Alex, Esben Danielsen, Thomas)
Alex will buy tickets for them today
Fablab TI is participating with 2 him and the studenthelper
Lucas will sign them up with two tomorrow

I sent an email to Chris, David and Leonard with an overview to make sure that all of them received the message.

Hej Alle

Her kommer lige en staus:

**Fablab NV = 6**  
**Underbroen/Maker = 2**  
**BetaFactory** = Har fået fat i Christopher og han tilmelder dem fra BataFactory.  
**Copenhagen Fablab** = Ringede på Tlf. nr fik fat i en Dorthes tlf. svarer? Jeg har skrevet til Rasmus Fangel på mailen der står i kontaktarket igen samt FB.  
**Illutron og Fablab RUC** = Nicolas deltager ikke grundet vinterferie. Den er videregivet til Schack. Har ringet til Schack.  
**Labitat** = De er tilmeldte med 6 og vil gerne have en ekstra med og er meget nysgerrige :)  
**Orange makerspace** = Har ringet til Mads og han sørger for at tilmelde dem i dag.  
**Fablab TI** = Morten tilmelder dem med 2 senest i morgen tidlig.  
**Space 10** = Har ringet til Guillaume og fik Noé Bhandari mail. Har sendt mail med engelsk version og dansk version til begge.  
**BioTeket** = Har prøvet at få fat på Lasse uden held. Jeg har sendt ham en reminder mail.  
**Mig = 1**  
**Liisa** = Har sendt en reminder mail med engelsk og dansk version.  
**Stina** = Har sendt sms.  
**Ali Mirakbari** = Har ringet og han checker sin mail.  
**CPH Music Makerspace** = Har ringet og givet reminder.

Nu skulle der gerne komme lidt gang i hjulene på den billetbestilling! ;)

Kh Kirsten

We were identifying how much it would cost and at this point we thought that it would go well with getting participants but then the bus trip started to go downhill. In the next section I will discuss how the collaboration disintegrated, despite being well connected via: Email, Skype, Phone calls and Google drive.

### **E-MAIL STRING 1 MARCH 2019: BUSTUREN HÆNGER MED RØVEN UNDER VANDSKORPEN<sup>10</sup>**

The articulation in the mail itself indicated that David and Chris were lacking the motivation. Because who want to put their power into a bus trip where the articulation is that the bus trip hangs with the ass under the surface of the water? They were angry that they had done a lot of work and people were not buying enough tickets. Had we been too optimistic with the popularity of the trip? We had 29 participants but the coordination process that includes the *shared engagement*, the *shared alignment* and *shared responsibility relations* were lacking (Wenger, 2004, pp. 99, 102, 103).

### **THE 3 MARCH 20:30 // SKYPE MEETING**

The 3 March 20:02 Leonard and I held a meeting on Skype as Chris and David did not participate (Appendix 23: Memo meeting 3 March 2019). Chris did not get that we had a final agreement on meeting and was in in the movie theater. David was sick. I sensed that they were mad that 'BioTeket' and 'CPH music Makerspace' were not participating. They had expressed at the last meeting held via Skype that they were not interested in making the trip if 'Biotektet' and 'CPH Music-Makerspace' did not participate which might have something to do with funding since they are all located in Copenhagen municipality. Therefore, I sent David a status after the meeting (Appendix 23: Memo meeting 3 March 2019). I thought, that it was preposterous to cancel the trip. It was three initiatives out of the eleven initiatives that are not interested in participating. I did not think that the non-participants should spoil it for all of the others. It was a matter of finding the right transportation so

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<sup>10</sup> Title of the Email translated to English: 'The bus trip hangs with the ass under the surface of the water' which connotes that something is going idle.

approximately 35 people could “travel” around among the eight initiatives. I contacted another bus company.

### **THE 4 MARCH 20:30 // SKYPE MEETING**

At this meeting, we agreed that we should continue making the trip since the formalities should not spoil the trip. We would need 40 participants to provide dinner; otherwise, the managers would have to settle on snacks or pay for dinner themselves (Appendix 24: Memo meeting 4 March 2019). I asked Leonard to contact ‘BioTeket’ and ‘CPH Music Makerspace’ as he has a special gift of persuading people. He said that he would call them. I had tried with no luck (Memo, 4 March). Leonard suggested that ‘Copenhagen Maker’ and ‘Fablab Nordvest’ could post it as a commercial initiative to get the last tickets home. Thereby we should open the event for citizens and members (Appendix 24: Memo meeting 4 March 2019). Chris said that she had seen on ‘Labitat’s’ internal chat channel that they had talked about if ‘Copenhagen Maker’ had commercial intentions with this trip and wanted to earn money on the trip. Chris said that ‘Copenhagen Maker’ was not interested in vouching for a commercial event. I agreed with Chris and mentioned that it would also spoil the purpose of the trip. From here, we started to have meetings once a week.

### **THE 11 MARCH 20:30 // SKYPE MEETING**

David had another meeting. I had gotten an offer on a bus that included taxes to 5.331,88 DKR holding 34 people. We decided to use that bus if we only got 34 participants, then we would have money to dinner (Appendix 25: Memo meeting 11 March 2019). However, if we got extra participants, then it would make sense to use the bus we already had (Appendix 25: Memo meeting 11 March 2019). I had written ‘Ørestad HackLab’ but had not heard anything yet. I would call ‘Copenhagen institute of interaction design’ (CIID) at Wednesday to get a status on their interest in participating (Appendix 25: Memo meeting 11 March 2019). Chris would send out an email with updates and a new ticket type as well as codes to tickets to the managers from ‘DTU

Diplom Lab' so they could buy tickets for 3 managers. Then we had 32 participants.

### **THE 17 MARCH 20:00 // SKYPE MEETING**

This was a short meeting where we talked about status. We needed to confirm bus on Friday 22 March with the number of participants (Appendix 26: Memo meeting 17 March 2019). Thus, Friday 15 March 2019 Chris had opened up for the last seats to be filled in the bus so we would know which size the bus would be. However, as Chris was not participating and she was the one responsible for the tickets and proof of bus: we could not get a final status (Appendix 26: Memo meeting 17 March 2019). I said that I had written and gotten a confirmation from 'Fablab TI', 'Copenhagen Fablab', and 'Labitat' that they would show their facilities. Now, I needed a confirmation from 'Fablab RUC' and 'illutron' that they would show their facilities. From this meeting, the last statuses were coordinated via e-mails and then a final meeting was held the 3 April 2019. The 18 March 2019 Chris wrote:

Hej alle tre

Jeg glemte helt vores status i går aftes .Det beklager jeg.  
Her kommer en kort status:

Der er pt. Solgt 37 billetter (hurra!)

DTU Ballerup har købt 4 og Skylab 1  
Hertil har to fra Labitat købt af den åbne billettype.

Dvs: Bioteket og CPH Music Maker er blevet streget som steder. Jeg har allerede aftalt med Jesus, at han viser Ballerup spaces frem.

Jeg vil kontakte ' fra Skylab og høre om han vil gøre det samme.

Faktisk budgettet igen sammen, så der er råd til catering af både frokost og middag. Dog ingen kaffe/kage.

Kh

We would not visit 'BioTeket' and 'CPH Music Makerspace' as they had not bought tickets, instead we would visit 'DTU Diplom Lab' in Ballerup and 'DTU Skylab' in Lyngby. The budget matched up with the participants so we could get lunch and dinner during the bus trip. The 26 March 2019 I had received an Email from an employee at 'CIID' that would like to participate. I sent him a code so he could participate.

Du er heldig for der er netop én ledig plads tilbage. Du kan tilmelde til eventet [her](#) med denne kode: **MZWHK6QZ**

Jeg kan desværre ikke tilbyde at vi tager forbi CIID, men du er meget velkommen til at deltage og tage med rundt og se de andres initiativer.

The 8 March I had emailed with CIID's receptionist who said that they were interested in showing their facilities as they had a machine-learning exhibition that weekend. Leonard had taken the task and gotten 'DTU Diplom Lab' in Ballerup and 'DTU Skylab' in Lyngby to participate but Leonard was not certain if 'DTU Diplom Lab' in Ballerup and 'DTU Skylab' should show their initiatives on the 26 March. Thomas from DTU texted me as shown in the text messages below. I went into the Google drive structure and I checked if Chris had put them in the program, she said she had so I wrote Thomas back.

Leonard told me that he thinks so but I should ask you or Chris who are organising everything

I can see that you are on the list and that you will show DTU Ballerup 12:45-13:15 and DTU Skylab 13:45-14:15 🙌

We could not fit in 12 initiatives in the bus time schedule so I took a managers' decision and choose that we should see DTU Skylab instead of CIID (Appendix 28: CIID). I updated Chris on the decision and wrote that Ulrik from CIID had received a code to buy tickets.

Hej Chris

Jeg tog lige en lederbeslutning om at vi stopper hos Skylab istedet for CIID da der ikke er blevet ytret at CIID vil vise frem andet end fra deres receptionist jeg i første omgang skrev til.

Jeg har sendt koden til Ulrik

Kh. Kirsten

The 28 March 2019 Chris wrote:

Hej alle tre

En hurtig update på bustur

Der er pt. Solgt 43 billetter.

Jeg har åbnet op for linket til de sidste 11 billetter indtil på søndag, hvor vi skal bestille endeligt antal kuverter.

Kort overblik:

- bus booket i rigtig størrelse og uden kaffe
- frokost og middag bestilt

We had 43 participants and the KSBT was now a reality.

### **THE 3 APRIL 20:00 // SKYPE MEETING**

Chris said that she had ordered food and that it would arrive before we would go in the morning and when we would arrive 18:30 at 'Underbroen' (Appendix 27: Memo meeting 3 April 2019). The bus was confirmed with 43 participants so Chris had ordered a double-decker bus, and, in the invitation, we had written to the participants that they should be at 'Underbroen' at 9:00. Chris, David, Leonard and I would meet at 8:30 at 'Underbroen' so we had time to make coffee and get the sodas, beers and food into the bus. We divided the roles of Chris and David being toastmasters, we would all help to get people back in the bus, I was in charge of making sure that we got lunch and all of us would say welcome.

### **CONCLUSION: PROS AND CONS WITH THE COLLABORATION STRATEGIES**

There is a shared responsibility in the MMGC&R that gradually unfolds itself. It is that you have to offer to help with tasks because it will enable a better output, end product as well as the process of making this a process that is agreeable for everyone. It is apparent in the negotiation of how the contact sheet are made, which bus we should order, coordinating which initiatives that should go e.g. (Wenger, 2004, p. 99). Influence comes with the things you have done – the activity that constitutes part of the relations; trust, friendship to other coordinators in the initiatives, which constitutes connectivity (Wenger, 2004, p. 111). The management strategies of the veteran initiatives 'illutron' and 'Labitat' use Do-ocracy<sup>11</sup> and thereby are the personal authority

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<sup>11</sup> Appendix 1 Definition of concepts: Do-ocracy.

measured on the activity and *doing* the work. The management strategy of 'The association Maker' carries traits of Co-creation<sup>12</sup> where it is having a say in the process and end product that matters. This is a good example of how backstage work comes into the front stage as the intermediate results count in for instance making the KSBT (Schmidt, 2015, p. 363). However, Do-ocracy and co-creation as management strategies have cons since that the ones that are conscientious good at coordinating takes too much responsibility on them, which is evident in the case of Chris. When John looks over Leonard's shoulder and checks what he does, when performing tasks, it creates an destructive process as Leonard does not take the full responsibility for his tasks since there is always someone that thinks that it should be done different and is checking that he is doing it in certain way. This created a process with bumps in the KSBT as Leonard did not take the full responsibility of completing his tasks. In the *shared repertoire* of working with 'The association Maker' the immediate desire to make becomes evident as a ritual in making our processes as efficient as possible (Wenger, 2000, p. 242). When Leonard did not complete a task, Chris should have pushed the responsibility of Leonard's assignment back to him. An example of this was when Leonard found out the canteen personal at HKI are on winter vacation at the time when the bus trip would take place, so Chris had to find food as wells, in addition to ordering a bus and making a budget.

Pisse godt Stine.  
Mine madplaner er desværre gået i vasken pga ferie i køkkenet i den uge hvor turen er, så jeg går lige i tænke boks...

Chris could have provided Leonard with the telephone number of the food place and give him the responsibility of handling the food. In this way he would have shared the responsibility, which will also lead him to become part of the *shared repertoire* in the context of collaboration with members of 'The association Maker'. As shown above, I have narrated how the

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<sup>12</sup> Appendix 1 Definition of concepts: Orange innovation.

coordination of the KSBT took place. In the next section I will discuss the shared responsibility as part of the MMGC&R coordination processes.

## **6. KSBT - TOUR DE LABS**

In this chapter I will show what happened during the bus-trip and how knowledge was shared.

The bus trip took place on 6 April 2019 where each member had paid 400 DKK to participate in the KSBT via Billetto's event site (See Appendix 5: images, 13: Billetto Event). The bus trip started at 'Underbroen' at Christians Brygge 31, 1219 København at 9:00 where people turned up and drank a cup of coffee and talked to each other (See Appendix 5: images, 14: Cover) (See Appendix 5: images, 15: Map). We had gathered thirteen initiatives and as we would not have time to see all of them, we had chosen eleven of them that were some of the first initiatives in the MMGC&R (See Appendix 5: images, 16: Participants). We had anticipated that there were some of the members that might have difficulties with being on time and therefore the bus would drive at 9:15. However, both the bus and some of the members were late so our time plan was a little bit behind schedule from the start (Appendix 13: Participatory observations). As 'Appendix 5: images, 17: Time schedule' shows we would end and start at 'Underbroen' where we would end the KSBT by eating dinner together and talk.

### **READY. SET. GO!**

Finally, the bus and the last members arrived and people placed themselves with members from their community as one big boundary object with *Coincident boundaries* with a shared referent of seeing each other's initiatives (Star & Griesemer, 2015, p. 191). 'Appendix 5: images, 18: In the bus' shows that Casper, Oliver and managers from 'Fablab RUC' sitting in the back on the bus on the second floor.

## **1<sup>ST</sup> STOP // COPENHAGEN FABLAB // VALGÅRDSVEJ 4-8, 2500 KØBENHAVN**

First stop was 'Copenhagen Fablab' that was founded at January 2013 where Michael gave a presentation where he said that they have 100 unique users: *"We have some who are 13 years and we have some who are 78 years and we have 60% women and 40% who are not Danes in our lab"* (Appendix 29: Participatory Observations, KSBT). Said Michael. He showed their facilities both on the second floor and at the basement where they had placed their big machines as milling machines and a kiln. Michael said that they have had difficulties with their milling machine since the cutter head was not functioning (Appendix 29: Participatory Observations, KSBT). Casper from 'Fablab RUC' told Michael how he usually fixed their cutter head to their milling machine (Appendix 29: Participatory Observations, KSBT). When Michael and Casper connected over the milling machine, they engaged in what Wenger (2004) would call an *"A face-to-face conversation between two members of two communities"* (p. 134) which had the capacity to *"involve the boundary relation between them"* (p. 134). As Casper and Michael were the only two partners of the conversation, it enabled Casper to talk openly and share knowledge about the ways they repair their machines while Michael could be honest in telling about the machines' problems. When a private conversation is made between two members from two practices it has what Wenger (2004) states: *"... effort to promote the border relationship. However, the connection made is hostage to the partiality of the two interlocutors"* (p. 134). Reasoned by, it was only their two eyes that looked at the milling machine, which only created an interpretation of how the milling machine was *situated* in their practices. The negotiation of their knowledges that surrounded the milling machine was part of their *situated knowledges* and thus partially stems from their worldviews and their knowledge about the machines that they had bought and tried out. If other members had participated in the talk Michael and Casper would have received more knowledge about the various practices around milling machines as well as the member that would have participated which would have created a collective of meanings. Never the less, a connection was made that would promote the border relationship (Wenger, 2004, p. 134).

## **2<sup>ND</sup> STOP // FABLAB TI // GREGERSENSVEJ 1F, 2630 TAASTRUP**

Second stop was at 'Fablab TI', which is a Fablab located at The Danish technological institute that is part of the Consumer inventors counseling (Opfind.nu, 2019). Their student helper held a presentation about how 'Fablab TI' was part of the inventors counseling and helped inventors with making prototypes of their ideas and afterwards we were welcome to look around. The participants talked to other members of their initiative "*See this, see how they have done that*" and took pictures with their phones (Appendix 5: images, 19: Picture taking) (Appendix 29: Participatory Observations, KSBT, Fablab TI). "*We should get one of those*" (Appendix 29: Participatory Observations, KSBT, Fablab TI). Said Alex to Thomas and pointed his finger to the blue cable-and-box that sat in the loft (See Appendix 5: images, 20: Blue cable-and-box). They walked around individually and studied how the other initiatives had done organized their materials, how they had made their material pricelists, which machinery they had e.g. and picked up the experiences.

## **3<sup>RD</sup> STOP // FABLAB RUC // UNIVERSITETSVEJ 1, B. 4, 4000 ROSKILDE**

We got the participants back in the bus and drove to the third initiative 'Fablab RUC' (See Appendix 5: images, 21: Fablab RUC). During the bus trip Casper explained how 'Fablab RUC' started with 100 students in the 'HUM Tech' education where the students worked interdisciplinary. They used 'Fablab RUC' to experiment on projects and some of them were hired as student helpers. 'Fablab RUC' had been such a success that when it had reached 200 students at the 'HUM Tech' education, 'Roskilde University's Center' (RUC) made a decision for it to be part of the all of RUC's educations and open it for citizens (Participatory observations: KSBT, Fablab RUC). At the present, they have 60% women and are more tech than humanity (Participatory observations: KSBT, Fablab RUC). When we arrived, he made a presentation and showed how the students had experimented with creating a computer-controlled waffle iron, how it had taken time for them to make it and how fun it had been playing and experimenting (See Appendix 5: images, 22: Robot Waffle iron). Casper said, that most of the students worked 24/7 on

their projects because they were playing while learning (Appendix 29: Participatory Observations, KSBT, Fablab RUC). At 'Fablab RUC', the practice came first, then academia and then theory – not the other way around. Present, researchers were hired in 'Fablab RUC' to write about the projects and the innovation that comes out of 'Fablab RUC' (Appendix 29: Participatory Observations, KSBT, Fablab RUC). Their politics are that no question is too wild or too far out. For instance, a student wanted to find out how many plastic particles would come out of his washing machine in every wash. (Appendix 29: Participatory Observations KSBT, Fablab RUC). Casper and Oliver had made two tours in 'Fablab RUC' where they showed the facilities. I went with Casper who said that they buy their machines in china and fix them themselves. This means that they can keep a low budget. We had a little time before we had to get to the bus and the managers started talking to each other across initiatives (Appendix 29: Participatory Observations, KSBT, Fablab RUC).

#### **4<sup>TH</sup> STOP // ORANGE MAKERS // PENSELSTRØGET 66, 4000 ROSKILDE**

We got into the bus and drove to the fourth initiative, 'Orange Makers'. When we arrived Esben Danielsen was ready to shake each and every one of managers hands when they walked into the Makerspace (See Appendix 5: images, 23: Esben Danielsen). He went up on a table and said welcome. Each of the managers were listening and smiling while taking photos as he talked. He said that they are sharing their space with a café that is for people of marginalized groups named 'Makers corner' and said that they used to be located at a bigger hall and that: *"We would like to have a bigger room since we like to build extreme big stuff"*. For instance, they had built a big fire-truck at the old hall for the 'Dream city area' at the 'Roskilde festival' (Appendix 29: Participatory Observations, Orange Makers). However, they were only 70 members. But as long as they have members and the municipality does not disagree, then they let them be. The presentation continued by Alex and Thomas giving a tour in the Makerspace. We had difficulties with getting the members back to the bus as 'Orange Makers' is located at a big hall that hold

different containers and different floors with a café where one could buy coffee (See chapter 4, Orange Makers). The Mangers were exploring the facilities and we needed to get the manager out of the café and containers. The bus could not drive all the way up to the entrance as the Makerspace it placed inside the container district of *Roskilde* named *Musicon* (Appendix 29: Participatory Observations, Orange Makers). It was lunchtime so David, Leonard, Chris and I helped each other by telling the managers to get back in bus. It worked. We ate lunch and drove to DTU Design Build lab (DTU Ballerup).

### **5<sup>TH</sup> STOP // DTU DESIGN BUILD LAB // LAUTRUPVANG 15, 2750 BALLERUP**

DTU Design Build lab had a lot of 3D printers in their lab and some of them costed 600.000 DKR each (See Appendix 5: images, 24: 3Dprinter). They had a wood workshop and a plastic workshop and they were recycling their plastic in collaboration with *Vestforbrændingen* at *Møn* (Appendix 29: Participatory Observations, DTU Ballerup). Oliver from 'Fablab RUC' asked the managers during the presentation how come they placed their PLA<sup>13</sup> in their fume cupboard? The manager responded that it was due to them being located at DTU and thus wanting to be first movers as PLA emits harmful vapors if it is in large quantities, so this is a thing they do internally. Casper from 'Fablab RUC' talked with one of the mangers from 'DTU Skylab': Stories were told about machines: who has what now, and how they got a hold of it (Appendix 29: Participatory Observations, KSBT, DTU Ballerup).

### **6<sup>TH</sup> STOP // DTU SKYLAB // DIPLOMVEJ, B. 373A, 2800 KONGENS LYNGBY**

We went into the bus and drove to DTU Skylab at Lyngby. When we arrived, the manager started by telling about DTU Skylab, having an incubator where the student could work on their startups and went on to showing us their 3D printers. We continued the tour in the lab. David, Chris, Leonard and I had tried to move the focus of the KSBT away from it being a competition about

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<sup>13</sup> Polylactic acid or polylactide: thermoplastic aliphatic polyester derived from renewable biomass plastic to use in the 3D printer.

who had the biggest equipment, which turned out to be a clever move due to DTU Skylab having the most extensive equipment we had ever seen (Appendix 29: Participatory Observations, KSBT, DTU Skylab). (See Appendix 5: images, 25: Robot-arm, 26: Green machine, 27: Control board, 28: Windproof wall-machine). The managers were impressed and the managers from 'Labitat' were walking into one of the machines that were used to check if a wall in a house was windproof (Appendix 29: Participatory Observations, KSBT, DTU Skylab). I walked together with Alex and Chris on the way out of the machine hall. Alex said "*What a Fabrication orgasm!*" Chris responded by saying "*Yes, it was so good but I fell ashamed*" (Appendix 29: Participatory Observations, KSBT, DTU Skylab). "*Ha ha. Yes – But also a little bit inferiority complexes*", said Alex (Appendix 29: Participatory Observations, KSBT, DTU Skylab). Apparently, size matters in the MMGC&R, as it became evident that the machines are related to status. The member measures their identities and competencies when experiencing the machines (Wenger, 2000, p. 239). When Chris is saying that she feels ashamed or when Alex is articulating that he gets inferiority complexes by experiencing DTU Skylab they are feeling their needs to measure up to standards, a doubt and uncertainty about themselves in a lack of self-esteem. This is related to how authentic they thought they were to the primary activity of making via machines since *memberships of CoPs* are defined from the known and unknown (Wenger, 2004, 2000 pp. 14, 228) (Bossen & Lauritsen, 2012, p. 145) (Strauss, 1978, p. 123). In this sense, the hierarchy is evident through the authenticating with big equipment where the initiatives measure their own identity in relation to the technologies (Bossen & Lauritsen, 2012, p. 145) (Strauss, 1978, p. 123). With technologies and big equipment comes power in the MMGC&R. Because the digital machinery is the center of the MMGC&R practice. The logic goes like this, the more the machines, the bigger the knowledge; the bigger the machines, the bigger the production; the bigger the production, the bigger impact an initiative can have in the world. In this sense, it is through the machinery we enact our practice of teaching the students, citizens e.g. as apprentices how they can be empowered and switch their mindset to one of a Maker and a Hacker; a

growth mindset that thus makes them part of the *shared repertoire* (Wenger, 2000, p. 229) (Mol, 2002, p.5). The practice of DTU Skylab that both of Chris and Alex's identities were *experienced* and *negotiated* and it enabled them to imagine themselves in relation to the global MMGC&R (Wenger, 2004, p. 6). It created a *learning path* from where they were before the experience and where they are going after experiencing DTU Skylab (Wenger, 2004, p. 6). We walked to the bus and while we were driving Chris took the microphone and said: "So after that fabri-gasm we will drive to Fablab Nordvest at Smedtoften".

### **7<sup>TH</sup> STOP // FABLAB NORDVEST // SMEDTOFTEN 12, 2400 KØBENHAVN NV**

When we arrived, John was ready to talk about the initiative at *Smedtoften* where Copenhagen municipality, *Teknik- og miljø forvaltningen*, *Børne- og Ungdomsforvaltningen*, *Kultur og fritidsforvaltningen* and had been funded by Velux fonden: 'Konstruktive fællesskaber for udsatte unge' (See Appendix 5: images, 29: John talking) (Velux fonden, 2017). The purpose is to engage the youngsters that have turned eighteen and have not started on an education yet to get interested in taking an *erhvervsuddannelse* through the *informal apprenticeship* that they use when working with the milling machines and open source recycling plastic machines from 'Precious Plastics' placed in three shipping containers (Appendix 14: Smedtoften, John, 02:45, 03:13, 04:02) (Appendix 11: John, 54:03, 54:15). The managers were loosened up and were starting to talk more to each other and looking at the things together across initiatives at the containers (Appendix 29: Participatory Observations, KSBT, Fablab Nordvest) (See Appendix 5: images, 30: Looking at milling machines, 31: Taking pictures of Precious plastics).

### **8<sup>TH</sup> STOP // LABITAT // H. C. ØRSTEDS VEJ 5, 1879 FREDERIKSBERG**

We walked back to the bus and drove to 'Labitat'. When we arrived, there was a member that was sitting and coding and it came as a surprise to him that 35 people walked into the Hackerspace which resulted in him writing the warning on their chat channel shown at 'Appendix 5: images, 32: "LABI FILLED WITH HUMANS!!!!"' Many of the managers had never seen 'Labitat' and 'Labitat's' managers were giving tours in the Hackerspace and in their

bunkers that they had bought for 1 DKK of Frederiksberg municipality. (See appendix 5: images, 33: The entrance to one of the bunkers) (Appendix 29: Participatory Observations, KSBT, Labitat). When we stood outside by the bunkers Leonard said to me: *"It is nice to see how humble they are when seeing the other initiatives and how proud they are when showing their initiatives"* (Appendix 29: Participatory Observations, KSBT, Labitat). They were humble and curious to find new ways and methods and were asking each other questions about why they did in that way? (Appendix 29: Participatory Observations, KSBT, Labitat). The managers were good at placing their ego and their membership at home, which resulted in them nurturing the boundary relations and participate in making a great event (Wenger, 2004, p. 134). The bus was late, as it could not park outside of 'Labitat' so we waited for it to arrive. Eventually, it came and we could continue the journey to the Meat packing district where 'Space 10' is located.

### **9<sup>TH</sup> STOP // SPACE 10 // FLÅSKETORVET 10, 1711 KØBENHAVN**

Finally, the bus came and off we were to 'Space 10'. The manager from 'Space 10' said in the microphone: *"Basically IKEA gives us money and we play around with it and as long as we manage to create innovative solutions IKEA keeps on funding us"* When we arrived and entered 'Space 10' I heard one of the members from 'Labitat' calling it a hipster Makerspace. At their hall they had tables with wooden houses that had solar panels on them that were connected via Arduino's. It was a prototype of how houses could share solar energy (Appendix 29: Participatory Observations, KSBT, Space 10) (See appendix 5: images, 34: Circular solar energy, 35: Circular solar energy village, 36: Circular Arduino's). The manager from 'Space 10' gave a tour. We went on the second floor where they had office spaces (Appendix 29: Participatory Observations, KSBT, Space 10) (See appendix 5: images, 37: Office spaces). He said that they had researchers from Harvard, MIT and AiD Barcelona in their Makerspace doing research. They had interns that usually were there in 2 to 3 months. We went downstairs in the basement where they had a huge Makerspace. The managers from 'Labitat' were acting a bit rude in turning

pressing buttons on lights to make it into different shades. As shown on 'Appendix 5: images, 38: Makerspace, 39: Workshop' was 'Space 10's' Makerspace in general were very well organized. The managers centered on how 'Space 10' had organized the tape in creating meaning making that should result in reification and making the artifact into a boundary object (Appendix 29: Participatory Observations, KSBT, Space 10)(Appendix 5: images, 40: Picture of Tape, 41: Tape) (Wenger, 2004, p. 130). *Do you have tape? Do you have tape?* Said the manager from 'DTU Diplom Lab' to the other managers as one needs tape when making prototypes. The tape was part of the *shared repertoire* (Wenger, 2000, p. 229).

### **10<sup>TH</sup> STOP // ILLUTRON // REFSHALEVEJ 167 M, KAJPLADS 697, 1432 KBH K**

It was time to get back to the bus and see 'illutron' so it was about getting each and every one into the bus. Then we drove to the harbor at *Refshaleøen* and when we arrived at 'illutron', Casper went out and made a show with gas and fire (Appendix 5: images, 42: Fire) (Appendix 29: Participatory Observations, KSBT, illutron). 'illutron' is a Makerspace on a big boat where the members pay what they think a membership is worth. Casper went in and held a presentation and spoke about how they got inspiration from burning man as an organizational structure when making 'illutron', which is why they use Do-ocracy<sup>14</sup>. After the presentation Casper and Oliver gave a tour at the ship (Appendix 5: images, 43: Presentation). We went up the rusty stairs (Appendix 5: images, 44: Rusty stairs) (Appendix 29: Participatory Observations, KSBT, illutron). When we stood at the top of the ship Casper said that the government intended to cut the cultural budget by 40%. If 'illutron' did not receive cultural funding Casper and Oliver would have to pay 200,000 DKK each.

### **11<sup>TH</sup> STOP // UNDERBROEN // CHRISTIANS BRYGGE 31, 1219 KØBENHAVN**

We drove back to 'Underbroen' where 'At you service' had catered food. We ate and the managers were networking and drinking beers. Chris and David

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<sup>14</sup> Appendix 1 Definition of concepts: Do-ocracy.

gave a tour at 'Underbroen'. The managers were satisfied and said thanks to Chris, David, Leonard and I for making the KSBT. Later when Chris and I stood outside and smoked, Chris said "We should make more of what Esben Danielsen calls *Kissing meetings*<sup>15</sup> so people can socialize more" (Appendix 29: Participatory Observations, KSBT, Intranet, platform). I agree, reasoned by that when the different initiatives negotiate their competencies in relation to their sources and periphery's it enables them to connect to each other as it creates a ground for common practices, periphery's, borders, overlaps, connections and meetings (Wenger, 2004, p. 140, 141). During the dinner one of the employees from V-Lap at Aalborg University in Copenhagen said that she would like to make a Fablab at Grønland. Michael from 'Copenhagen Fablab' said that he knew some Makers at Greenland and that he can help if she wanted the contacts. I caught the interaction and started to brainstorm with the managers from 'Labitat' on making an intranet for the MMGC&R (Appendix 29: Participatory Observations, KSBT, Intranet, platform).

## **SUMMARY**

We have seen how managers are curious and have found inspiration in other initiatives' approaches. We have also seen how it sometimes can be difficult for the managers to control their ego but how they hold each other accountable in the *joint enterprise* (Wenger, 2000, p. 229). This was evident in how humble the managers in general were when visiting each other's initiatives as their CoPs are bound together by a collectively understanding of what the MMGC&R is about (Wenger, 2000, p. 229). Also, we have seen how the managers in the MMGC&R value the machines and measure their own identity and how authentic they are in relation to the machines (Wenger, 2004, p. 14).

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<sup>15</sup> Kissing meetings connotes that the initiatives should meet and make an assessment of each other by socializing more often to eventually be fond of each other.

## **SUB-CONCLUSION**

In order for the MMGC&R to grow they will need to make more connectivity to create shared processes. The managers were quite excited about the shared knowledge from seeing each other's initiatives and would like to go on more trips. So I am certain that this bus trip would not be the last. More meetings will contribute to creating a better understanding of that. The initiatives can imagine themselves in relation to the global MMGC&R, which will potentially reduce *othering's*. It enables us to develop together, to find a common ground for a consensus, a united approach to create synergies across initiatives, and managers of different backgrounds in the MMGC&R. Their horizon will be expanded to create what Wenger (2004) calls a "*practice landscape*" that is characterized by the initiatives being connected to each other via common practices, borders, peripheries, overlaps, meetings (p. 141). However, we need a new artifact that is an intranet because the managers centered on artifacts during the KSBT, which made questions arise about how to fix machines, how to open a Fablab and how to establish contacts.

## **7. DISCUSSION**

In this section, I will discuss the findings in relation to the research question, sub-questions and theories.

### **THE COMPETENCIES**

Through this thesis I have described the managers as social beings. As participant, they are *situated* in the social learning systems of MMGC&R, which in turn determine what they value as competent. The managers' identities are formed through the interaction between social competence and social experience that holds their knowledge (Wenger, 2000, p. 227).

One of the interesting things about MMGC&R is that the manager's knowledge has been put to a test when they meet across initiatives through the KSBT. During the bus trip the managers establish their own identity by showing how much they know about the machines. The machines have

become a symbol of power. Thus, the big machines create a primary activity as written in Wenger (2000): *"Since the beginning of history, human beings have formed communities that share cultural practices reflecting their collective learning: from a tribe around a cave fire, to a medieval guild ..."* (p. 229).

In the context of MMGC&R the big and massive machineries can be seen as "cave fire". The practices and experiences around the use of these machines determine how authentic an initiative is. The human aspect carries significance in how the managers shape their identities, competencies and knowledge of the joint enterprise that constitutes the MMGC&R (Wenger, 2000, p. 229) (Bossen & Lauritsen, 2012, p. 145) (Strauss, 1978, p. 123).

When the managers go back to their initiatives, they use their experiences to integrate their approach and the community. This creates negotiations in the different initiatives and form new competencies (Wenger, 2000, p. 227). Yet, this also creates conflicts, as the managers' *situated knowledges* are not alike. As Wenger (2000) writes: *"Our experience of life and the social standards of competence of our communities are not necessarily, or even usually, congruent. We each experience knowing in our own ways. Socially defined competence is always in interplay with our experience. It is in this interplay that learning takes place"* (p. 226) (Haraway, 1988, pp. 581, 582). The meanings about competencies will create new ways of communicating and coordinating in the initiatives, as some of the managers might leave their initiatives if they do not feel that they are taken seriously, or their activities are not appreciated as much as others or if they are talked over or not getting heard e.g. (Bossen & Lauritsen, 2012, p. 145). The managers practices, for example, how good they are at using the machines, fixing the machines and how good they are at coordinating, are *situated* and therefore are the enactment of the Maker Mindset: making and hacking that constitutes their skills. If authentic managers with great technical or coordination skills leave an initiative and they will make *"objects come into being and disappear with the practice in which they are manipulated"* (Mol, 2002, p. 5). If the manager that carries great technical or coordination skills move to another initiative then it might create conflicts in the initiative as it can place

them in a valuable position. However, newcomers might have technical and coordination skills that will only unfold after the veterans leave.

## **THE ARTIFACTS & BOUNDARY OBJECTS**

During the KSBT, the managers opened their eyes to new approaches and gained new experiences when they meet across borders (Wenger, 2000, p. 227). The managers have primarily centered on the artifacts which has become evident, for example, when they looked at how 'Space 10' had ordered their tape, when a milling head needed fixing in 'Copenhagen Fablab', how to organize the pricelist in 'Fablab II', which machines are better than others, how much they cost if you buy them from China, who has the biggest machines, and when the contact sheet has become the center of the coordination in the KSBT. As Wenger (2004) wrote: "*...use is a relationship between a user and an artifact. However, this user discards certain practices and is thus a member of particular practice communities. Artifacts are therefore boundary objects and their design is tantamount to design for participation rather than use alone*" (p. 130). In this sense, the artifacts have become boundary objects when the managers participated in finding out how they could *situate* the machines in their own practices. This participation enables them to create common references that can help to organize their connections between the initiatives. An example is for instance when the expression *Labs* is used. The term *Labs* is a boundary object that has become part of the *shared repertoire* as the managers needed a term to describe all of the connections out to the different initiatives that are part of the MMGC&R (Wenger, 2004, p. 130). This term has gone through a process of participation since the reification of the initiatives needs to be approved (Wenger, 2004, p. 129).

Wenger wrote: "*Conversely, the politics of participation must include the power to exercise equality, since equality equals the focal points around which people negotiate what matters*" (Wenger, 2004, p. 112). Thus, the boundary object, for instance, the way 'Space 10' had organized their tape; create fixing point for the MMGC&R to create a shared repertoire. This enables them to coordinate and communicate across initiatives to create a shared responsibility (Wenger,

2000, p. 229).

## **THE CENTER & THE INTRANET**

In connection to the discussion of boundary objects above, it is evident that a center in the MMGC&R is Chris - "The Maker Mama". The managers have to go through her to get the information about how many tickets are sold and if it fits with the budget during coordination (Star & Griesemer, 2015, p. 192).

Chris has become an obligatory passage point that the managers have to pass in order to get a certain kind of information that they cannot get anywhere else (Star & Griesemer, 2015, p. 173). Thus, I argue that it is crucial at this point that an intranet is made as it will enable the managers to benefit from Chris' knowledge when they start to document their initiatives: for example, creating "recipes" on how to fix machines, how to open a Fablab and find contacts, they will have a common referent - an intranet. The intranet in this sense is a boundary object that will help people to visualize how the communication flows, to communicate internally across the initiative's borders. Eventually this will contribute to the emergence of a new mean of communication where the managers can share the knowledge they need as a Repositories and with coincident boundaries when documenting (Star & Griesemer, 2015, p. 191). I am well aware that there is a difference in making an intranet and making a website for an international movement. However, there are also similarities. For instance, when maxigas (2012) describes the content in Hackerspaces.org in the history of the Hacker movement, he mentioned, "Notably, most of these developments focused on the formal characteristics of hackerspaces, for instance how to manage problems and grow a community" (maxigas, 2012, p. 5). Based on this the intranet can enable knowledge sharing and enable the MMGC&R to evolve and make an opening for them to create new events and initiatives across the initiatives. However, there is still a need for *kissing meetings*, as it may help them to understand each other better and may reduce the prejudices and *othering*. Nevertheless, finding a united effort will not be easy as these initiatives have different views (i.e., ideas of authenticity) and conflicting interests (i.e., some

of the initiatives are non-commercialized and some are pro commercializing). But that is also why an arena, a common ground needs to be formed to bridge these gaps.

## **THE ARENA**

During the KSBT Leonard asked if we should open the tickets to external people that wanted to participate in the KSBT but 'Labitat' did not want to participate in an event with an commercialized agenda. And Chris and I was not interested in it either. If the MMGC&R is going to create a united approach, there are also political agendas that need to be debated in an arena. As Strauss writes, "*these arenas involve political activity but not necessarily legislative bodies and courts of law... Some of these social world issues may make front-page news, but others are known only to members or to other interested parties*" (Strauss, 1978, p. 124). Folloing Strauss' thoughts, I argue that whether there is Do-ocracy or Co-creation, there will be a majority and a minority when it comes to negotiating politics to find a joint effort. Based on my observations, the patterns I see of whom will win the debate is based on the agendas of external events and the internal events that have been non-commercialized, that there are more Fablabs than Makerspaces in the MMGC&R, that the majority gets funding from the public sector, and that the social aspect of doing things together is more in focus than producing products. In the light of that I argue that the non-commercialized will win and this battle will create a new path.

## **THE AUTHENTICITY**

The new path will carry authenticating processes where the initiatives that have a commercialized agenda. And this means for instance 'Fablab Nordvest' will lose its authenticity. Thus, will the initiatives that constitute the minority either fit in or be pushed out in the periphery and become *near right fakes* or *down right fakes* since the "*real stuff*" will be the non-commercialized (Strauss, 1978, p. 224) (Wenger, 2004, p. 140). It would be romantic to say that the all of the initiatives that have been part of this KSBT will be part of the A-team that creates the trade association; however, I do not

think this will be the case. Instead, the process will take years and unexpected issues will emerge and have an impact on different processes. Still, the managers are curious and like to share knowledge, which is part of the Maker Mindset and the shared repertoire (Dougherty, 2016, p. 144). Furthermore, the managers showed an interest in creating further KSBTs. When the conflicts are handled, they create new relations, closer bonds, synergies and involvement, which is part of forming a shared responsibility and the joint enterprise (Wenger, 2004, p. 99). As Wenger (2004) writes: *"Families ...develop their own practices rituals, artifacts, symbols, conventions, stories and histories. Families hate each other, and they love each other; they agree, and they disagree. They do what is necessary for making it work"* (Wenger, 2004, p. 16). Thus, the MMGC&R may practice handling conflict across borders and through the *kissing meetings* they will create a joint effort. And when they do it, they will create what Wenger defines: *"When communities of practice are defined and interconnected, they form a complex social landscape of common practices, boundaries, peripheries, overlaps, connections, and encounters"* (Wenger, 2004, p. 16). Through the lenses of Mol (2002) there are different needs that need to be taken into consideration in the coordination. These objects will change. The next time we coordinate a bus trip new objects might arise (Mol, 2002, p. 5, 13, 14, 15). In further KSBT we need to be observant making strategies so the initiatives communicate across borders, move closer and eventually start to negotiate the trade association.

## **8. CONCLUSION**

In this thesis, I told the story of how the MMGC&R stem from the Hacker movement, 'Fablab Danmark' and from the 'Roskilde festival's' innovation unit 'Orange innovation' and how their historical development has an impact on how associations are made, how they coordinate and with whom they communicate. Thus, is knowledge shared through the different pedagogics when teaching newcomers in the machines where they are taught the Maker Mindset either if it is through Hacker ethics or apprenticeship. Two of the

initiatives help to get people at the borders of society better opportunities for handling problems and help youngsters into work via informal apprenticeship, the Maker Mindset, and the knowledge sharing that can be enhanced. Also, we have found that a *near right fake* FabLab exists with a commercialized agenda in the MMGC&R. We have seen that there are different roles in the managers, different organizational strategies in democracy and co-creation, which has an impact on which job they fulfill. We have also seen; how different means of communication have an impact on the coordination practices and what is perceived as shared responsibility. We have also seen the background of the managers have an impact on how they take part in the shared responsibility. We have seen that a center in Chris' tacit knowledge needs to be changed into an intranet and thus create a new mean of communication. The managers have clustered around artifacts that help them to create common references when coordinating and making a shared repertoire and a shared responsibility. We have seen how the managers are interested in creating KSBTs and it will be interesting to follow the journey, the road and to understand which direction the knowledge sharing bus will take the MMGC&R. Since this has been the first mapping of the MMGC&R, topics for further research have emerged: It could be interesting to investigate how the MMGC&R can be anchored in the educational systems as 'Fablab RUC', for instance, to create a new approach to combine apprenticeship with theory via abduction. Another project could be to investigate how the municipalities can integrate the MMGC&R as creative consultancies. Last and third, what does making information into tangible things via 3D printers mean for our industry, educations and way of doing it together (DIT) as consumers: Are we moving towards a new age or are we in one?

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