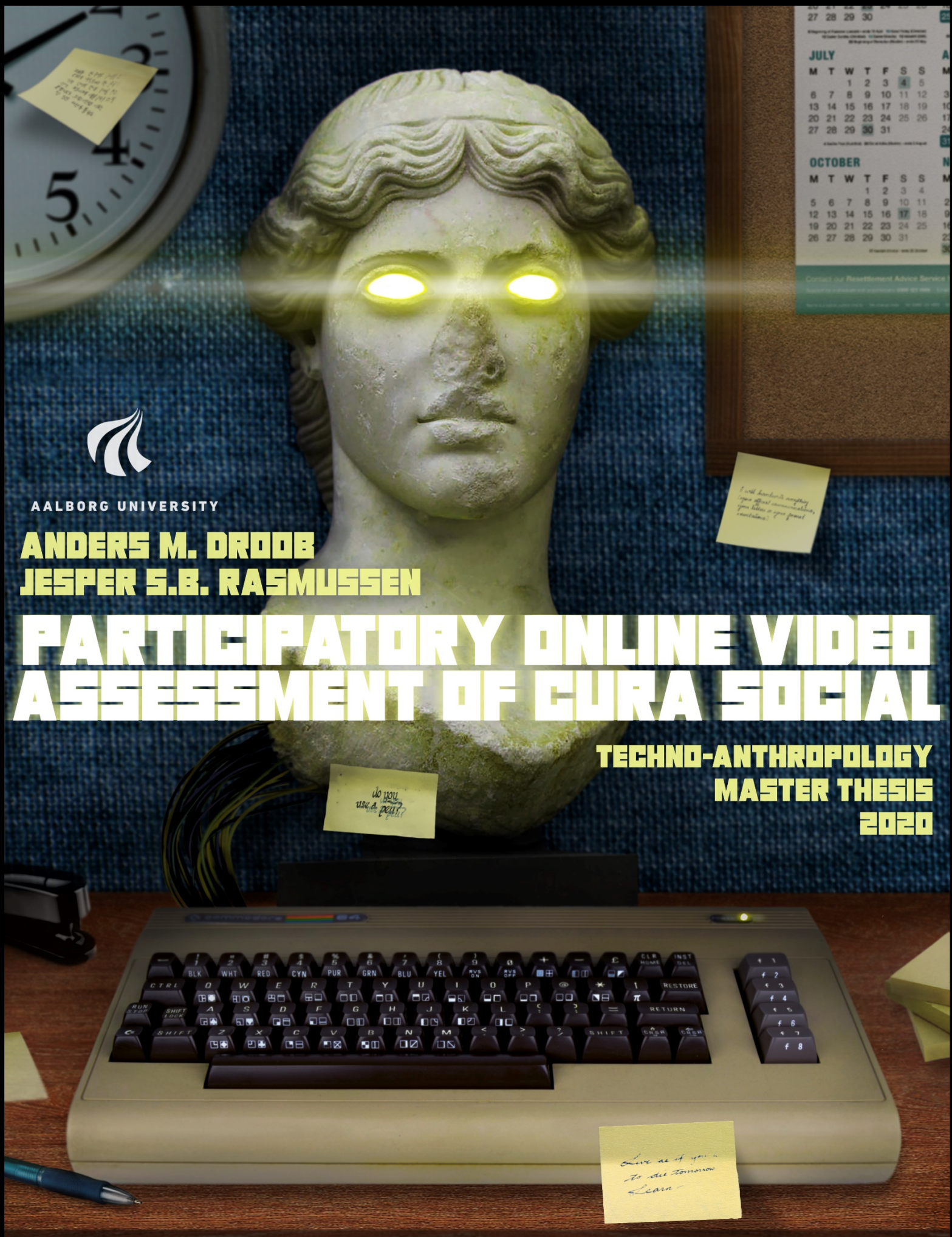

AALBORG UNIVERSITY

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PARTICIPATORY ONLINE VIDEO ASSESSMENT OF CURA SOCIAL

TECHNO-ANTHROPOLOGY
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By signing this document, each member of the group confirms participation on equal terms in the process of writing the project. Thus, each member of the group is responsible for the all contents in the project.

SYNOPSIS: This Master thesis focuses on the socio-technical aspects of the Electronic Health Record system Cura Social implementation in the Handicap area in Hjørring and Aalborg municipality. EHR systems are constantly being developed, and replaced, and have shown to be notoriously difficult to implement successfully. This research has investigated the implementation process from the perspective of the end-users. The use of the digital method *Participatory Online Video Assessment (POVA)*, made it possible to reach out and incorporate end-users despite geographical challenges. POVA is a combination of participatory tools and techniques, Voice over Internet Protocol technologies, and desktop sharing, and acted as an important method to research the end-users experiences, and opinions of Cura. Lastly, this thesis examines how the implementation of Cura has affected the end-users work practice, and why the system is experienced negatively, but with a promising outlook on the future.

Preface

Disclaimer from Head of Studies and Head of Study Boards

COVID19 and the consequences of the lock-down of society and the university since March 13, 2020 have had influence on which activities that have been possible to stage and carry out as part of the project work. More specifically, this means that activities have been limited to online activities, and that activities such as Lab activities; surveying activities; on-site ethnographic studies and on-site involvement activities have not been possible. When assessing this project, please bear this in mind.

The lock-down of the Danish society resulted in a cancellation of all the fieldwork we had planned from March 17 and forward. Instead of postponing the research or changing its focus completely, we saw COVID19 as an obstacle that called for proactive, creative, and digital methods. By combining participatory tools and techniques, we developed a promising online method using VoIP platforms and desktop sharing.

This master thesis was made by two Techno-Anthropology students from Aalborg University. The project period extends from February to June 2020.

We would like to thank our informants from the social psychiatry in both Aalborg and Hjørring Municipality. We appreciate your participation in our online workshops.

We would like to thank Jonas Hall for creating the front-page illustration.

Last, but not least, we would like to express our gratitude towards our supervisor Pernille Bertelsen for excellent feedback and moral support throughout the project.

Contents

Glossary

Municipal Authority - Translation of the Danish word *Myndighed.* Municipal authorities at the Handicap area commissions the social care delivered by the social workers at the residential accommodations and day centers.

Cura Social - The EHR system implemented in the Handicap area in Hjørring and Aalborg municipality. Cura Social is part of the Columna Cura Suite. Cura Social is at times just referred to as Cura.

Residential Accommodation (RA) - Translation of the Danish word *Botilbud*. Disabled and socially marginalized adults can be offered accommodation at one of these places by the municipal authority. These are staffed 24/7.

Day Center (DC) - Translation of the Danish word *dagtilbud*. Disabled and marginalized adults can be offered affiliation to a DC by the municipal authority. The DC offers various activities. A citizen affiliated with a DC would normally spend their weekdays here (morning to midday - Monday to Friday).

Electronic Healthcare Record (EHR) - A collection of digitally stored information about a citizen. The purpose of an EHR is to secure a better course of treatment for each citizen across the healthcare sector. In Danish it is possible to distinguish between the hospital and the municipality version of the EHR; *EPJ* and *EOJ*. In this thesis, we use the term EHR for both regional and municipal records.

Social Worker - Employee working with disabled and marginalized adults often at residential accommodations or day centers. In Danish, the word *socialpædagog* is used.

Front Staff - Describes the healthcare employees in direct contact with citizens, such as social workers and nurses.

Superuser - Translation of the Danish word *superbruger.* An employee from a residential accommodation or day center, who has been selected by the department manager to pass on and teach the rest of the employees about the new EHR system.

Administrative Social Worker - Translation of the Danish word *sagsbehandler*. Administrative social worker. Administrative social workers are part of the municipal authority.

Voice over Internet Protocol (VoIP) - a group of technologies that deliver communication over internet protocol. A video link can also be a part of this grouping.

Desktop Sharing - A feature that allows the user to broadcast their screen to the other participants in the VoIP session.

EHR-Team - The municipal administrative project managers working with Cura implementation.

Residents - The residents at residential accommodations.

1. Introduction

As Cura was crossing a river she picked up mud and began forming the clay-like substance into a human being. When pondering what she had made, Jupiter came along. Cura asked Jupiter to give her creation *spirit* and Jupiter promptly granted her wish. When Cura wanted to name her creation after herself, Jupiter forbade it and insisted the creation should be named after him. While Jupiter and Cura were arguing, Tellus, the goddess of the earth, arose. She argued that the creation should be named after her since it was her body the creation was made from. The parties decided that Saturn should settle the dispute. Saturn decided: since Jupiter gave the creation spirit, he should take back its soul after death. Since Tellus made her body available for the creation, she would receive the body back after death. At last, Saturn said: since Cura first fashioned the creation, she should have and hold it as long as it lives, but since it was made from the earth, Saturn decided it should be called homo (Latin for a human being) because it is made from humus (Latin for earth). (Henriksen, 2011; Reich, 1995)

The myth tells the story of how the Roman goddess Cura, whose name means *care*, created the first human. The myth conveys how care is central to human existence. Humans are cared for all through origin, life, and destiny as Cura has and hold it as long as it lives.

Care today plays a major role in the responsibility of the public sector. To optimize the care, Health Information Technologies (HIT) are being developed rapidly. In these years, many Electronic Health Record (EHR) systems, both in the Danish regions and municipalities, are being replaced (Sundheds- og Ældreministeriet et al., 2018). One of these systems is Systematics *Columna Cura Social* which was implemented in the Handicap area of Hjørring and Aalborg municipality in the fall of 2019. Many advantages are associated with HIT and EHR technologies, however, the process of implementation is often problematic (Xiao et al., 2014; Garde and Knaup, 2006).

Care, in the public sector today can be understood as a deeply socio-technical endeavor. The EHR system, named after the Roman goddess of care, is an excellent depiction of this understanding. This thesis is not a call for luddite tendencies in healthcare, quite the opposite, as it studies how the EHR system is deeply integrated in the care work practice and how this knowledge can support future implementations of EHR systems.

This thesis explores the EHR system Cura as it is being integrated into the social psychiatry work practice. From the perspective of the front staff, the study revolves around Cura and how it demands new knowledge, division of labor, and facilitates new circumstances of the social care delivered by the staff. The thesis uses an online participatory method to investigate how Cura can be understood from a socio-technical framework to support future similar implementation projects.

2. Problem Analysis

The following chapter will present the underlying context of this research. Starting with a broad perspective of the Danish welfare state and the different healthcare strategies, the problem analysis then narrows its focus on the complex context of digitalizing the Danish healthcare. In this chapter, a broader understanding of technology will be outlined as well as the unit of analysis. The purpose of the chapter is to outline why it is important to understand electronic health records systems as a socio-technical entity.

2.1 The Danish Welfare State

The Danish welfare model values equality as the most important norm. Every citizen has the same possibilities regarding healthcare. This means that a citizen's economic or social rank does not matter in the service provided by the public sector. Everybody has a right to healthcare. (Hjortbak and Handberg, 2018)

Vallgårda and Krasnik (2016) describe healthcare as a:

> *"... the combination of resources, organization, financing, and control which results in the production of healthcare benefits for the people. Health benefits encompass medicals, treatments, care, rehabilitation, information and disease prevention i.e. health benefit aimed at citizens, which is carried out by people which is paid for their service". (p.11) (Translated)*

Healthcare is quite complex. The healthcare system should be understood as one organ but is a collection of numerous areas, people, organizations, departments, and political discourses that shape the system. (Hjortbak and Handberg, 2018)

At the top of the healthcare system is the government and politicians, which directs the focus areas of the system. The regions oversee hospitals, general practitioners, medical specialists, and psychiatry. Lastly, the municipalities oversee nursing homes, home care, rehabilitation, and social psychiatry. When a citizen has been to the hospital, it is often the municipality's job to follow up and

end the course of treatment. It is therefore important that the municipalities are prepared to receive and adapt to the distributed tasks from the secondary sector (ibid.).

Because of the above, it is necessary that the various Health Information Technology (HIT) systems in the different sectors can communicate and understand each other. This demands a need for technological competencies by the front staff and interoperability between the systems. (Sundheds- og Ældreministeriet, 2018)

2.2 An Expanding and Improving Healthcare System

As a result of the development and improvement of healthcare, citizens can live longer with various chronic diseases. This means that citizens with chronic illnesses and diseases, that previously were deathly, now live longer and thereby increase the national expenditure (New Insight, 2014). The growth of the healthcare system is an economic challenge. The expenses for the preservation and development of the Danish healthcare system have increased by 69 % from 2000-2017 (Rasmussen and Kristensen, 2019).

Several national strategies, made by key actors in healthcare, suggest how it is possible to maintain and improve the Danish healthcare. The Danish healthcare will experience a major pressure in coming years due to the demographic challenges. The post-war baby boom is catching up and the number of elderly people reaching retirement and in need of extra care is increasing (Eurostat, 2019). These strategies, therefore, act as indicators for both national and municipal goals in the near future on how to further develop the Danish healthcare. The strategies revolve around digital healthcare, healthcare in the future, technology integration, and self-sufficient citizens (Regeringen et al., 2016; Sundheds- og Ældreministeriet et al., 2018; Sundheds- og Ældreministeriet, 2018; Kommunernes Landsforening, 2019)

2.2.3 Strategies for Danish Healthcare

On a global level, Denmark is a first-mover when it comes to having national strategies in relation to the implementation of HIT. In 1995 the first strategy was published, which focused on the *digitalization of Denmark*. This plan of action mentioned "Utilization of IT" as a focal point (Villumsen

and Nøhr, 2019). Since 1995, there have been numerous strategies published. The following section will revolve around four strategies from 2016-2019, that focus on the digitalization of the Danish healthcare system.

The strategy published by Danske Regioner, Kommunernes Landsforening (KL), and the Danish Government, aims attention at the overall digitalization of Denmark in both the private and the public sector (Regeringen et al., 2016). Danske Regioner is an interest group focusing on the regions' activities working in the secondary sector (Danske Regioner, n.d.), whereas KL is an interest group for the municipalities (Kommunernes Landsforening, n.d.a).

The utilization of digital technologies is a focal point now and in the future. Improved information security and technological expertise by the front staff are important in achieving citizen safety and trustful relationship with the Danish public healthcare (Regeringen et al., 2016). The strategy also outlines that the Danish society must be inclusive of both those who are *technology prepared* and those who are not (ibid.).

The interconnected medical procedure is also on the national agenda. The following quotation specifies:

> *"When the appropriate healthcare data is exchanged digitally between hospitals and the municipal healthcare services, better opportunities for coordinating the patient's course is achieved. In doing so the patient does not have to act as liaison and be responsible for handing over the information of the course of treatment between healthcare professionals. This increases safety and a better course of treatment." (Regeringen et al., 2016, p.28) (Translated)*

The authors of the aforementioned strategy have in collaboration with the Danish Ministry of Finance published a strategy in 2018 (Sundheds- og Ældreministeriet et al., 2018). This strategy focuses on making the citizens self-sufficient, creating interconnected medical procedures, prevention of diseases, improved information security, and successful technology implementation. These strategic goals are all based on digital solutions and data usage to either prevent diseases, streamline medical procedures, or make the patients more involved in their own treatment (ibid.).

In 2018 the Danish Ministry of Health published another strategy (Sundheds- og Ældreministeriet, 2018). Like the before-mentioned strategies, this one also focuses on data use, and the possibilities it brings.

> *"It is a matter of information. About using the information in the best possible way. The right information, in the right hands, at the right time." (Sundheds- og Ældreministeriet, 2018, p. 3, p. 9) (Translated)*

The last strategy we will present was published by KL in 2019. This strategy focuses on the municipal context and outlines the goals for the municipalities in the following years. As seen in the previously mentioned strategies, many areas are the same; integration of technology, interconnected use of data, citizens as self-sufficient, and making employees in the primary sector ready for digitalization. (Kommunernes Landsforening, 2019)

Even though the strategies are different, many of the goals are the same. It is obvious that the potential of healthcare data is not being fully utilized. A recurring motif is the importance of making the citizens more self-sufficient by handing them different self-monitoring technologies. These technologies have the purpose of giving the citizens an understanding of their own course of treatment.

2.3 Digitalization of the Danish Healthcare Sector

Today digital solutions and healthcare are deeply integrated. New opportunities for e-consultations, e-booking, medicine ordering, and app-solutions are common. The opportunities also include the patients with initiatives such as the PRO-project (Patient Reported Outcome), Telemedicine, and giving citizens access to their own health data via the platform Sundhed.dk. Denmark is today ranked among the top countries in relation to Information and Communication Technology (ICT) in the health sector (Sundheds- Ældreministeriet, 2012).

The current landscape of the health sector looks like this:

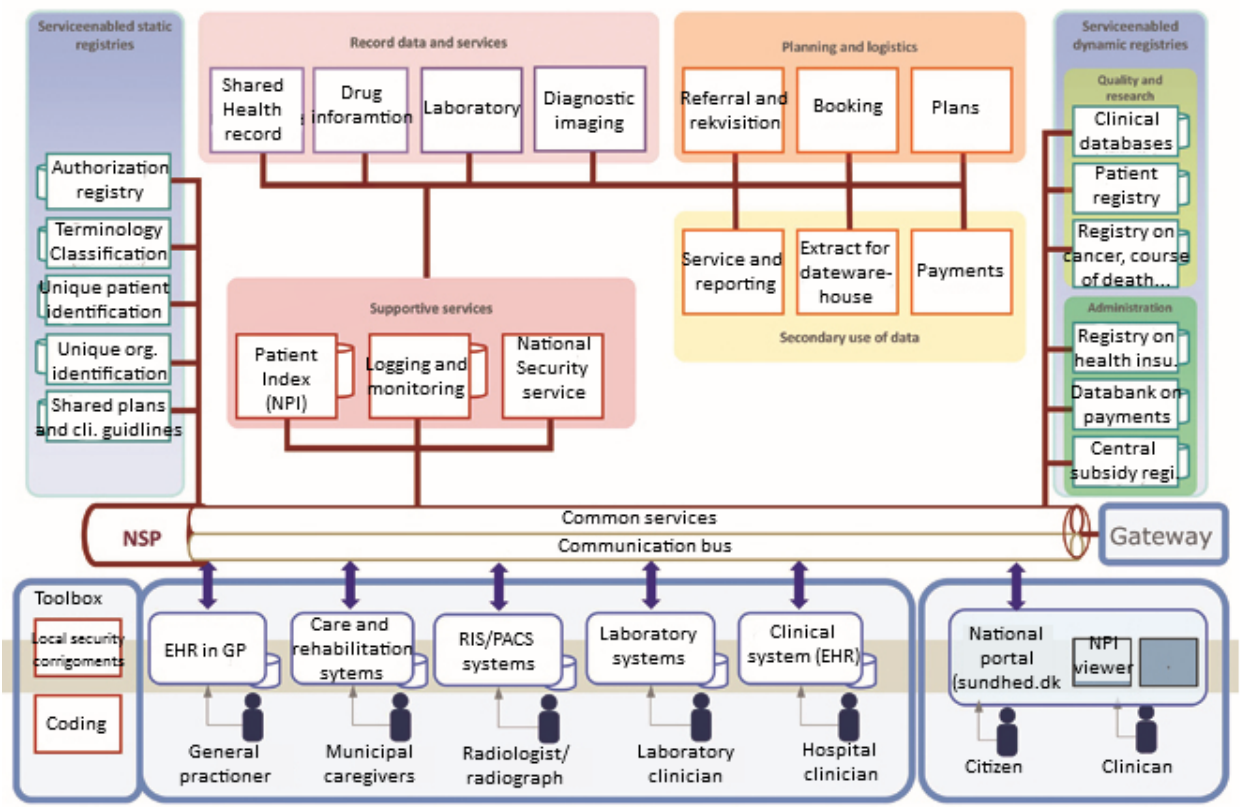

Figure 1. Replica of (Larsen, n.d.). The current landscape of the Danish healthcare system visualizes the complexity of the IT infrastructure. The purpose of the digital healthcare system is the opportunity to receive information about a citizen's health record regardless of where the data is registered and stored (Digital Sundhed, 2010). At the bottom of the illustration is where the local digital solutions, such as Electronic Health Record (EHR) systems, are implemented (ibid.). The hospital clinician thereby uses its EHR to connect with the National Service Platform (NSP). The NSP acts as a distributor, which grants access to the variety of healthcare databases that the clinician can read (Sundhedsdatastyrelsen, 2020). An example of the process is when a social worker uses the municipal EHR system to receive information from the Fælles Medicinkort (FMK) database about the medication of a citizen (Sundhedsdatastyrelsen, 2019).

Transitioning from analog to digital changes the understanding of healthcare. The transition calls for new specialized actors to tackle the challenges arising from such a transition. MedCom is one of those initiatives. MedCom was established in 1994 and the purpose was to digitalize and standardize the communication between hospitals, general practitioners, and municipalities as the transition went digital, and a need for standardization occurred (MedCom, 2020). The work practice of the healthcare professional is also changing as an effect hereof. Learning new ways to optimize treatments with the assistance of technologies as well as maneuvering the new digital solutions. *Wiring* healthcare has changed many elements of the sector. Well-functioning eHealth has shown potential in relation to:

- "Improved flexibility and effective ways of organising treatment, leading to improved quality and safety in treatment and care.
- Enabling more individualised treatment by empowering patients and involving them in their own treatment.
- Better working conditions for employees in the health and welfare sectors by improving workflows and reducing time spent on gathering information about a patient from other parts of the health care sector. This allows doctors and nurses to devote more time to patients. "(Sundheds- Ældreministeriet, 2012. p.5)

What about the municipalities then? As with hospital services and general practitioners the municipality has also undergone a transition to digital solutions in the last two decades. However, transferring the same Electronic Health Record (EHR) system, from the general practitioners and hospitals to the municipality caused difficulties. The EHR systems were designed for hospitalized patients and not the municipal context. Therefore, a new system for the municipality context had to be developed (Grøn et al., 2019). One of the obstacles is the difference in professions and areas of expertise within the municipality such as autism, intellectually-, physically-, hearing-disability as well as socially marginalized, elderly, and addicts. The care of the citizen can, therefore, take many forms e.g. rehabilitation, training, social care, home care, and involves various professions.

The municipal healthcare is, simply put, ordered by the municipality authority (myndighed); delivered by the front staff (nurse, social worker, etc.); and received by the citizens. With the increased spending in municipal healthcare, there has been a need for data and feedback in relation to accountability, effect, and quality of care. Ad hoc care and undocumented observations were a thing of the past. With initiatives such as Fælles Sprog (described in chapter 2.6) and Fælles Medicinkort (FMK), the foundation for coherence and better information exchange were laid. (Grøn et al., 2019)

2.4 Digitalization as a Wicked Problem

Throughout the description of the complex Danish healthcare system, it is evident that many stakeholders, actors, and legislations must be incorporated and considered before expectations can be realized. The planning of such a complex and problematic project is known as a *wicked problem*

(Rittel and Webber, 1973). Rittel and Webber describe a wicked problem as the opposite of a tame problem. A tame problem can be explained as a mathematical equation, where it is possible to distinguish if the problem is solved or not (ibid.). The wicked problem, on the other hand, is highly complex, with no right or wrong answer. In addition, there is no stopping point in wicked problems, since it is always possible to: "...*try to do it better*" (ibid., p.162).

The digitalization of the Danish healthcare system can be seen as a wicked problem (Nøhr et al., 2019). The goal is fuzzy, long-term, with numerous stakeholders, legislations, and discourses to consider; is it possible to ever reach a point of a digitalized system where it is not possible to change anything for the better? Rittel and Webber describe every solution which is trying to solve or improve the current system as a *one-shot solution*. They argue that each solution will leave traces, since it is not possible to just remove the solution without affecting economical and human aspects, such as work practice. (Rittel and Webber, 1973). In the context of large-scale implementation of healthcare systems, the economical factor is significant, and with more than 290.000 employees in the Danish health sector (Hjortbak, and Handberg, 2018) many will be affected by changes.

2.4.1 The Unique Case of Healthcare

There are many advantages of introducing EHR systems and the opportunities are widely associated with the technology (Wilkinson et al., 2020). But why is it that building integrated systems in healthcare is a challenge? (Xiao et al., 2019; Garde and Knaup, 2006). Many studies related to EHR are investigating the transition from paper to digital record systems (Waterson et al., 2012; Embi et al., 2013; Noblin et al., 2013). However, EHR solutions in Danish healthcare is not a new technology since it has been used for more than 20 years (Villumsen and Nøhr, 2019). Therefore, EHR systems have often been replacing one another. Knowledge of a prior EHR system does not necessarily mean unproblematic implementation of the next. Recent cases include the new EHR in Region Sjælland and Hovedstaden where problems included the response time and proper integration of FMK among other problems (Hildebrandt, 2017; Mellemgaard, 2016).

The regions and municipalities in Denmark will see a large replacement of EHR systems in the coming years (Sundheds- og Ældreministeriet et al., 2018). One reason is the transition to FSIII and the overall aim of facilitating data coherence and continuity of care. Implementing an EHR system brings new methods and changes. It can often be a distracting process for the healthcare organization and

especially the front staff directly interacting with the technology (Angoff et al., 2019). A successful implementation is dictated by a wide variety of factors, and difficulties include limited usability, impeding efficiency, effectiveness, and user satisfaction (Xiao et al., 2019).

"Computers can land people on Mars, why can't they get them to work in a hospital?" is the question asked by Jones (2003, p. 1). What makes the healthcare sector such a debated field of ICT application? Garde and Knaup (2006) outline seven characteristics of the health industry and why it is unique and not just another application field such as: finance, education, or manufacturing.

Characteristic 1: the complexity of clinical knowledge. SNOMED CT (Systematized Nomenclature of Medicine Clinical Terms) contains over 1.46 million relationships and new knowledge and relationships are always being discovered or become relevant. Healthcare requires specialized knowledge in depth and width.

Characteristic 2: the complexity of clinical information. Sharing health information is a complex task due to the variety of information and the constant change in the state of the patient.

Characteristic 3: the variability in healthcare. Treating a patient cannot be categorized in a simple package**.** "Rather, a patient has for all practical purposes an unlimited set of characteristics which constantly changes." (ibid. p. 267) Ideal medicine for one patient, may not be the right for another, even if symptoms are the same.

Characteristic 4: relevance of health information over time. Health information is relevant for a long period of time and the exact state of the record must be reconstructable at any given time.

Characteristic 5: **patient-centric health information**: a comprehensive and patient-centered view is necessary for useful and efficient healthcare, however: "in most countries, health care features a very heterogeneous systems landscape providing large challenges to being able to semantically share the information which is of utmost importance for efficiency and safety in health care" (ibid. p. 267)

Characteristic 6: **the complexity of the healthcare domain and stakeholders.** The healthcare organizations and providers are heterogeneous, and a course of treatment involves interaction with many different professions and organizations. Furthermore, integration between research and clinical routines must be implemented to ensure "... that new clinical knowledge derived from research becomes available for routine clinical care." (ibid. p. 267)

Characteristic 7: patient safety and automation. Mistakes and errors are part of everyday life, but it is required that healthcare is perfect and error-free. Flaws and imperfections are less tolerated in the healthcare domain as the consequences can have a direct impact on patient safety and wellbeing.

The municipality has increasingly been given responsibility for citizens health due to mainly three reasons:

- With the Danish municipal merger in 2007 many tasked have been moved to the municipality
- Patients are discharged earlier from the hospitals
- With the increase of self-monitoring, telemedicine and digital solutions some citizens rarely see a doctor

(Gøeg, 2018)

With the increasing responsibility and tasks of the municipalities in Danish healthcare (Gøeg, 2018; Kommunernes Landsforening, 2019) the seven characteristics are transferable to a municipality setting. Therefore, we find it relevant to highlight these characteristics as they also exemplify why the municipalities can be a difficult application field.

2.5 The Concept of Technology

With the increasing digitalization of healthcare in the municipality sector, there is a need for assessment and understanding the impact of HIT; *does the technology fulfill the desired purpose?* Assessing HIT is a complicated task. The following will describe why this task is complicated as assessing HIT first requires an understanding of what technology is and the socio-technical complications of implementing technology.

Technology is not merely a one-dimensional artifact. Introducing technology into a context will not simply alter one aspect, but rather coarse ripples of changes: intended and unintended. Technology is on one hand a strategic and economic resource for industries and governments. In addition, people enjoy the new opportunities and standards of living new technology brings. On the other hand, technology is deeply implicated in the complex challenges such as: population, workplace safety, privacy and an untenable expensive healthcare (Rip et al., 1995); showing duality and the paradox of technology. To better comprehend the relationship between technological and social change, as well as identify and solve problems related to technology, an open-ended conception of technology is needed. Jens Müllers socio-technical theory (Müller et al., 1984) serves as a useful conception of technology in this context. This understanding incorporates four elements into the aspect of any

technology: technique, knowledge, organization, and product (Müller, 2013). These four elements cannot be separated and are part of a dialectic relationship. A change in one of the elements will influence the others.

Using this notion of technology within the context of healthcare, **technique** is the sum of all possible tools used by the healthcare worker. Technique encompasses all the possible *resources* processed; the *manpower* needed to start and run the process and the *tools* used. **Knowledge** is the active knowledge of the healthcare worker relying on skills and intuition. Increasingly, this knowledge is being designed into the technical element as passive knowledge. Knowledge is also the know-how the healthcare worker must possess to operate certain tools. **Organization** is the division of labor and specialization within healthcare. In healthcare, the work is divided in accordance with the area of expertise. This presupposes many procedures to unify the division of labor which, to a certain degree, depends on communication with and between patients. The **product** is the result of the treatment. In a traditional manufacturing context, the product would be the end result such as a car. These goods have the benefit of being stock able. However, the product of healthcare is different. Rather than goods, healthcare provides a service that must be used as soon as it is produced. (Nøhr, 2017)

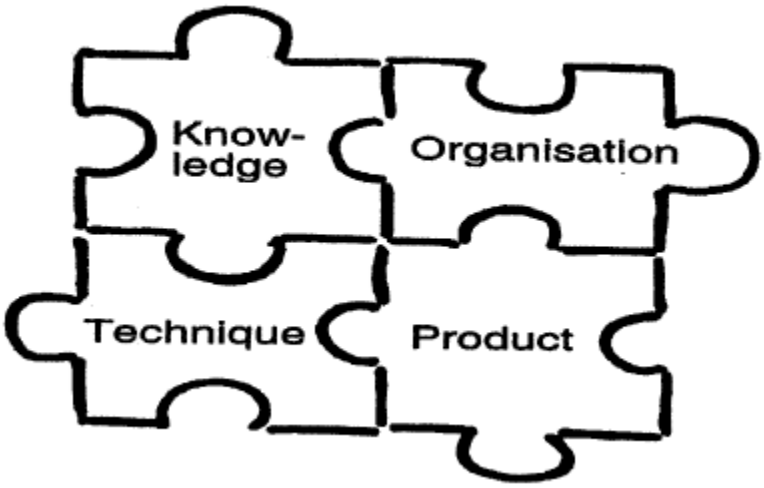

Figure 2. The four elements in the broad concept of technology in accordance with: technique, knowledge, organization, and product (Nøhr, 2017)

Using this concept, it is possible to see the relations and changes in one element, and how they affect the others. Introducing a new tool or changing the division of labor (*organization*) demands a need for new *knowledge*. This in turn may require adjusting part of the *technique.* The treatment of the

patient will again be affected by the process (*product*). When a new comprehensive EHR system is replacing another; new knowledge and division of labor must be established which, together with the technique itself, influences the service provided.

For a technology to be chosen and implemented it must have an actual social carrier of technology.

> *"A social carrier of a technique is a social entity which chooses and implements a technique: it 'carries' it into the society. Such a carrier may be a company, an agricultural cooperative, or an individual peasant. Every technique must have an actual social carrier in order to be chosen and implemented." (Edquist and Edqvist, 1979, p. 313)*

For a technology to be chosen in a specific context six conditions must be fulfilled.

- A social entity must exist which have an **interest** in choosing the technology
- The entity must be **organized** for it to make decisions
- The entity must have enough economic, social and political **power** to be able to implement the chosen technique
- **Information** about the existence of the technique is necessary for the entity
- The entity must have **access** to the technique
- **Knowledge** of how to handle the technique is also necessary for the entity

(Edquist and Edqvist, 1979)

The first three conditions relate to characteristics that are inherent to the social entity (interest, organization, and power). Contrary, the latter are all related to the specific technology. If the first three conditions are fulfilled then the latter three can often be acquired elsewhere e.g. trade, literature, and consultant advice (ibid.). The first three conditions can be said to remain at the policy and power level, while the latter is at the "shop floor". Edquist and Edqvist distinguish between actual and potential carriers of technology. If all six conditions are met the social entity is an actual social carrier and the technology will be introduced. The conditions are together sufficient for implementation to take place. If the entity does not have enough power to materialize the interest, the entity can only be considered a potential social carrier. Power is a crucial element. A potential carrier can gain more power and be transformed into an actual carrier. An example could be labor unions within a company.

This understanding of technology and social carriers broadens the comprehension of technology and how to assess it. It is useful because it exemplifies HIT as more than a neutral artifact. Power, interest, visions, and agendas are embedded in the implementation process. Furthermore, does the technology, when implemented, cause changes not only for the healthcare worker, but also for the organization, the citizen, and the technology itself in a dialect manner. This understanding of technology is beneficial and will be used throughout this thesis.

2.6 Fælles Sprog - A Shared Municipal Language

A key technical method in the municipality health practice is Fælles Sprog. Developing and implementing Fælles Sprog have caused big changes in work practice, the knowledge required, division of labor as well as being a deciding factor in which EHR system the municipalities (the social carrier of technology) deems potential candidates.

Fælles Sprog is a joint municipal language developed to secure coherence in the documentation and better exchange of data between different work practices, legislations, and disciplines. This is not a straightforward task. The first version came in 1998 and the second version in 2003 (FS3, n.d.a). It is expected that the latest version, FSIII, is implemented in all municipalities before the end of the first quarter of 2020 (Kommunernes Landsforening, n.d.b). Where FSII was based on the Danish service legislation (serviceloven), FSIII incorporates the health legislation (sundhedsloven) as well. FSIII covers the traditional elder area (home care and nursing homes), rehabilitating initiatives (e.g. physiotherapy), the handicap area as well as the authority and visitation department. (FS3, n.d.b)

In short, FSIII is a new shared standard for the registration of data in the health and elder areas.
"FSIII contributes to better coherence and data recycling in the municipal IT-based record systems. This will happen through the implementation of uniform terminology, classification, and adjusted work procedures." (FS3, n.d.b). FSIII promises a move towards lesser "free text documentation" and better reuse of data. On a management level, FSIII provides the ability to extract statistics across different citizens and the foundation for more effective work and quality. At a macro-level FSIII supports the sharing of data across the health and elder area, internally in the municipalities, and their communication with external actors such as hospitals and the general practitioners (FS3, n.d.b.). The framework on which this coherence in data is built consists of mainly three elements:

- "A generic process model - consisting of six sub-processes which forms the bases for homogeneous documentation practice.
- Condition - express the citizens' functions or health-related situation at any given time. Regardless of legislation, function, and discipline the same terminology and method of describing what underlines the authorization of the municipal efforts.
- Structured and classified data - information that is documented in defined fields from a list of predefined options or as free-text. Optimization of documentation, information search and communication (exchange) and forms the basis for recycling and updated data" (FS3, n.d.a, p. 5) (Translated)

FSIII uses the SNOMED CT reference terminology. Meaning that all conditions are related to a specific SNOMED CT. This standardized classification, therefore, supports the above-mentioned elements.

2.7 Systematic Columna

Fælles Sprog III is the key method in the EHR system, Columna Cura. In the public procurement of the new EHR system for the Handicap Area at Hjørring and Aalborg municipality, the system's ability to incorporate this new method was decisive.

Columna Cura is developed for the employees at municipalities in the health, care, and social sectors (Rasmussen, n.d.), which includes physiotherapists, occupational therapists, pedagogue, social workers, and district nurses.

> *"The solution gives them a clear and updated overview of their task and the citizens they are in contact with. The solution simultaneously takes the coworkers' tasks into account and helps navigate and keep an overview in a busy workday."*
> *(Rasmussen, n.d.). (Translated)*

A main aspect of the system is its mobility. With Cura, the user can document together with the citizen on a tablet. Cura also supports the documentation process with *Voksen Udrednings Metoden* (VUM). (ibid.) VUM is a systematic administrative tool for the administrative social worker (sagsbehandler) approach focusing on disabled adults and socially marginalized people (Socialstyrelsen, 2019).

Columna Cura Suite is developed by Systematic, and within this suite is Cura Omsorg (care) and Cura Social. Cura Omsorg is developed for use in the health- and elder care (Systematic, n.d.a), whereas Cura Social is aimed at the work with marginalized and disabled adults within the health and social legislation (Systematic, n.d.b). Both Cura Omsorg and Cura Social are developed with the common underlying purpose; act as a *good colleague* (Aalborg Kommune, 2019).

This thesis will be focusing on the implementation of Cura Social in the social psychiatry, which will be further elaborated in the following section.

2.8 Unit of Analysis

Residential accommodations (RA) and day centers (DC) are a part of social psychiatry. Social psychiatry encompasses social work with marginalized people, people with mental, and physical illnesses. The social work revolves around pedagogical aspects such as rendering support and assistance. (Det Sociale Netværk, n.d.)

People with the aforementioned illnesses are offered social services, in accordance with §85 of the Danish service legislation:

> *"The municipal council must offer help, care or support, as well as rehabilitation and support to the development of skills for people in need due to their decreased physical or psychical functionality or special social challenges." (Danske Love, n.d.) (Translated)*

The municipality authority can provide RA apartments and/or affiliation to a DC. The RA is the citizens' home. These facilities are staffed day and night. Where a RA is offered to people who need support with ordinary and daily elements, such as getting dressed or brushing teeth, DC acts as a social *gathering point* for people with disabilities, such as down syndrome. At the DC, the citizen can participate in different pedagogical activities depending on the condition and wants. These include sheltered work, creative workshops, excursions, and sensorimotor exercises. A citizen affiliated with a DC would normally spend their weekdays here (morning to midday - Monday to Friday).

On the 28th of October 2019, Cura Social was implemented in the Handicap area at the municipality of Hjørring. Likewise, the system was implemented on the 13th of November in the Handicap area at the Aalborg municipality (Aalborg Kommune, n.d). On both occasions, Cura Social replaced the former KMD Care System (EKJ). The implementation of Cura Social occurred at both municipalities as the *second* Columna Cura implementation, since both municipalities had implemented Cura Omsorg at the Elder Care area. Cura Omsorg went live on March 12, 2018, in Hjørring Municipality, and 13th of May 2019 in Aalborg Municipality.

The case of this thesis will only revolve around the implementation of Cura Social.

2.9 Problem Statement

Throughout this problem analysis, it has been described how the digitalization of the Danish healthcare system has developed over time. The expansion and growth of the system keep evolving, which is evident based on national strategies that frame the digital focus areas in healthcare. Health information has become the alpha and omega of the future. Digital solutions, self-monitoring, and HIT systems have an unexploited potential that can be utilized to improve the Danish healthcare system.

The municipal healthcare sector is not a simple application field; this thesis studies *why* that is. Through a case study of the implementation of Cura Social, we point towards socio-technical aspects of the Cura implementation and thereby contribute positively to understanding the ramifications of healthcare digitalization and EHR implementation. This has led to the following problem statement.

How can the implementation of Cura Social in the social psychiatry be understood as a socio-technical challenge?

- *How is the implementation experienced by the social workers?*
- *What can be done to support future similar implementations?*

3. Structured Literature Review

The following chapter is a structured literature review regarding the implementation of Health informatics. The review was conducted as part of this thesis' methodological approach and shows state of the art research of the field. Furthermore, the review has been a valuable learning source throughout the project. In cooperation with a librarian from the library of Aalborg University, three relevant databases were chosen. The databases were: Scopus, Cinahl, and Den Danske Forskningsdatabase (DDF).

3.1 Search String

The search string was compiled in collaboration with the librarian at Aalborg University Library. Five key terms were defined to transform the subject area into a search string usable in the database. The string was revised several times until a satisfactory string and number of hits were achieved. Each column was separated with the operation *AND*. The search string used in the structured literature review is visual in table 1.

Overall phenomenon	What	Specific phenomenon	Who	Theme
("Health Informatic" OR "Technology enabled care" OR "TEC" OR " Healthcare" OR "Social work*")	("EHR" OR "Electronic Health Record" OR "Electronic Medical record" OR "Electronic healthcare system" OR "Medical Information System" OR "Electronic Medical System" OR "Electronic Care Record" OR "Electronic Patient Record" OR "ECR" OR "EPR")	("Implement*" OR "adopt*")	("Care worker*" OR "Social worker*" OR "pedagogue*" OR " Clinician*" OR "Staff")	("workflow" OR "work practice*" OR "work routine*")

Table 1: An overview of the search string used in this study.

The following figure 3 shows the process from the selection of databases until the articles used in the project. A more detailed description of the procedure of the structured literature review can be found in Appendix A.

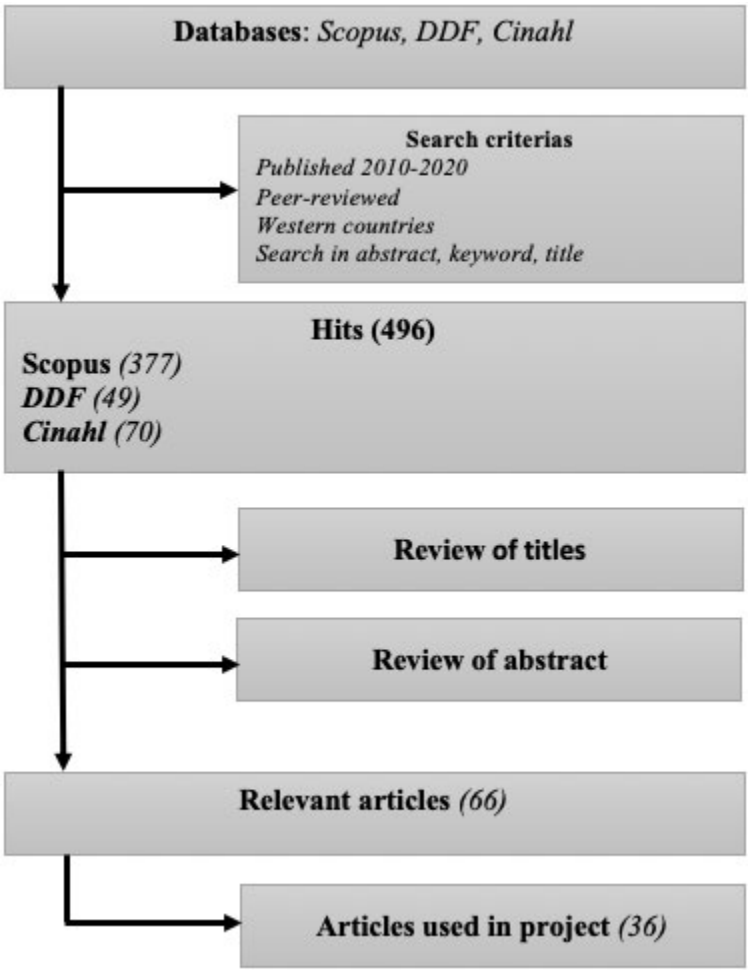

Figure 3: The process of the structured literature review

Linguistic Differences

The literature in this review holds certain characteristics. Much of the research revolves around nursing in a hospital setting. Naturally, much of the research from the Cinahl database is related to this topic, but also the Scopus search returned an overwhelming amount of literature about this.

The reason behind these numbers is the challenges of translating the Danish vocabulary. In Danish it is possible to distinguish between the hospital and the municipality version of the EHR; EPJ and EOJ. However, such specification in search criteria is not possible when searching for literature outside of Denmark, due to the uniqueness of the municipality and regional context and division of labor. However, it is interesting that so much of the literature is revolving around the secondary healthcare sector. The primary healthcare sector is underrepresented in the literature. This study positions itself in this knowledge gap and will try to explore the implementation of EHR from a municipal point of

view, contributing to the growing research field on the implementation of EHR in healthcare. We argue that the literature is still relevant and useful in this project.

3.2 Results of the Structured Literature Review

Distinct themes are related to the literature of EHR in healthcare. The articles in this structured literature review have been focusing on two aspects in relation to the implementation of EHR: *identifying barriers* and *overcoming the challenges.* Four underlying themes in each of the aspects will in the following section be elaborated. Table 2 visualized each theme and which aspect it belongs to. The following sections will first explain the different methodological and theoretical approaches of the articles before describing each theme.

Identifying barriers	**Overcoming the challenges**
Theme 1: Socio-technical complexity	Theme 5: Patience
Theme 2:Work practice changes	Theme 6: User incorporation
Theme 3: Standardization and data sharing	Theme 7: Collaboration
Theme 4: Technology and coordination	Theme 8: Education

Table 2: Visualization of the themes of each aspect

3.2.1 Approaches

Among the literature different methodological approaches have been used. However a significant amount was rooted in qualitative disciplines, such as ethnography and interviews (Saleem et al, 2015; Novak et al., 2013; Howard et al., 2013; Heckle and Lutters, 2011; Heckle 2011; Goh et al., 2011; Unertl et al., 2012)

Hansen et al. (2019a) describe different waves of theoretical approaches to processes of implementation. The first wave is change management in the late 1940s with researchers such as Kurt Lewin and John Kotter (Hansen et al., 2019a). This tradition was mostly focused on the management aspect underlying the importance of creating a vision, empowering others to act on the vision, and institutionalizing new approaches (Kotter, 2007). The second wave of literature broadens the scope to encompass the different factors that influence an adoption process. The wave began in

the 1960s and 1970s (Hansen et al., 2019a) and took off with research such as diffusion of innovation (Rogers, 2003). The third tradition of implementation literature is centered around the EHR implementation research. Since the late 1990s, when EHR first began to take off, it has been studied in implementation research. Central categories in these researches are: "1) Barriers to successful implementation; 2) Factors associated with successful implementation; and 3) Studies reporting on efficiency and productivity pre- and post-EHR implementation." (Hansen et al. 2019a, p. 143). These themes of the third tradition are in line with the themes emerging from the implementation literature reviewed in this thesis. This thesis' review is focused on the front staff perspective, whereas Hansen et al. also encompass patient satisfaction and perception.

In this thesis' review several frameworks have been used when managing EHR implementation. The Technology Acceptance Model (TAM) (Kim et al., 2015; Hansen et al., 2019a; Howard et al., 2013) is an evaluation model by Davis (1989). The model is used to explain how users come to use and accept technology. The model is mainly focused on two factors when users are presented with a technology: perceived usefulness and perceived ease-of-use. TAM has received critique for relying too much on human rationality in implementation. Newer modifications to the model, such as the Unified Theory of Acceptance and Use of Technology (UTAUT) seeks to overcome this critique by incorporating conditions of social influence and facilitation (Hansen et al., 2019a).

Another well-known model for evaluating implementation of EHR is Delone and Mclean's "Information Systems Success Model" (2003). The model describes the relationship between six elements for the success of an information system: information quality, system quality, service quality, system use/usage intentions, user satisfaction, and net system benefits. In our review of the literature, one study (Bossen et al., 2014) used the model.

Participatory design (PD) as a method was also used in three articles (Jensen and Kushniruk, 2014; Krist et al., 2013; Tang et al., 2018). In the study of Jensen and Kushniruk (2014) they used clinical simulation as a boundary object to achieve mutual clinical agreement on the content, acting as a third space for understanding between stakeholders. In the paper by Tang et al. (2018) user-involvement and PD were used in the design and implementation of a clinical information platform. User-involvement, combined with agile software development, proved effective in engaging clinicians for developing complex HIT systems. From these studies it is interesting to see how PD, as a tool, can deal with the barriers of HIT implementation; especially the differences in knowledge and frames

when a rigid and objective system is integrated into highly complex and improvisational contexts (Novak et al., 2013; Schmidt et al., 2019).

3.2.2 Identifying Barriers

Theme 1. Socio-technical Complexity

IT solutions and more specifically EHR in healthcare is widely recognized as a field with many benefits including: improving effectiveness, quality of care, and reducing the organizational cost (Kim et al., 2016; Rogers et al., 2013; Chao, 2016), better patient and staff satisfaction (Rogers et al., 2013), more complete documentation, and fewer errors (Howard et al., 2013)

Incorporating digital solutions in healthcare is a challenging affair, but why is that? In the problem analysis we argued why healthcare is unique and a difficult application area for ICT. Not only is it unique but EHR can also be seen as a wicked problem (Hansen et al., 2019a; Schmidt et al., 2019), involving many stakeholders and agendas. The domain is more complex than simply designing a system to store patient data. It is widely documented that HIT in healthcare is challenged by this complexity and "... involve significant coordination, interdependence, and interactions among care providers" (Goh et al., 2011, p.565).

Much of the literature is centered around social elements in the implementation of EHR technologies. Various articles highlight the socio-technical part of HIT (Heckle and Lutters, 2011; Cresswell et al., 2011; Rogers et al 2013; Kim et al., 2016) an example is Waterson et al. (2012 p.114) who writes: "... findings provide further evidence that there is a need to treat the implementation of EPRs not simply as an exercise in technical system delivery, but as a larger process of sociotechnical systems change". The systems are developed and operated by people in the healthcare sector and these people have different work practices and views on what the system should do and how it should operate with other systems (Hägglund and Scandurra, 2017).

Novak et al. (2013) describe how a collision of frames is often at work in the adoption of HIT. The paper describes how "... the nurses' orientation (the Practice Frame) can collide with the orientation that is represented by the technology and its implementation (the System Frame), resulting in adaptations at the individual and organization levels." (p.331) The System Frame represents the functionality and cumulative assumptions, decisions, and perceived possibilities of the system by the

vendors and decision-makers. The Practice Frame is similar but represents the perceived possibilities from the end-users' situated perspective in the practice. This again highlights the myriad of stakeholders and agendas involved in the HIT which can cause instability if the context of implementation is not understood or considered fully. The paper concludes how the System Frame is less flexible and less able to encompass all the dimensions of patient care. Whereas the Practice Frame can adapt their current workflow to incorporate the new technology, for instance, by persisting in the use of paper notes (Novak et al., 2013). In relation to the nature of the different perspectives and frames, Schmidt et al. (2019) also characterize the hospital employees' work practice as "... interpretative, multi-tasking, collaborative, distributed, opportunistic, interrupted and usually reactive. Whereas the model embedded in EHR design is usually objective, rationalized, linear, normative, localized (in the developer's mindset), solitary, and single-minded" (Schmidt et al., 2019 p. 373).

Theme 2. Work Practice Changes

When implementing new HIT in healthcare routines and workflows are being altered. Studying this effect is the center of many articles. (Heckle and Lutters, 2011; Chao, 2016; Colligan et al., 2015, Goh et al., 2011; Howard et al., 2013) all researched these changes, typically from a qualitative methodology.

Heckle (2011) concludes in her research of a Single Sign On solution (SSO) in a clinical department how "... in choosing SSO, the organization took a technological deterministic view of the implementation without considering the unique characteristics of the clinical departments" (Heckle, 2011, p.18). Understanding the context and specific routines of the relevant area are essential when implementing EHRs (Howard et al., 2013; Novak et al., 2013). Routines are crucial in any work environment as they can help reduce the cognitive workload and variability, yet routines can be flexible and adaptive to change (Chao, 2016). The nature of healthcare practice is ad hoc and improvisational; adjusting to moment changes and immediate occurrences. Technologies, such as an EHR, have the ability to disrupt healthcare professionals' routines, activity patterns, and cognitive regularity (ibid.). Therefore, it is interesting to research the changes happening when systems focusing on consistency and standardization are introduced in a highly non-consistent workflow.

In the paper by Chao (2016), she studies two key components of collaborative work routines as they are affected by the implementation of a perinatal EHR. The components are documentation and

communication. Three main changes were found to these components: "... increased variability in the documentation, increased use of personal notes, and increased frequency of inter-professional communication while preserving intra-professional communication patterns." (p.109) A reason for these changes was the existing practice of the healthcare professionals emphasizing flexibility and autonomy (Chao, 2016).

Workload increases with the implementation of a new system. Especially for straightforward tasks, the cognitive workload increases due to previously routinized tasks being disrupted. Consequently, nurses reported losing track of their patients as they were concentrating on learning the new system (Colligan et al., 2015). However, the clinical and administrative support staff experienced reduced work burdens compared to the clinicians (Howard et al., 2013). The reason being that staff work was typically more routinized than the work of the clinicians "... and therefore tends to be more conducive to the structured format of an electronic system. Clinician work, on the other hand, is characteristically more complex and unpredictable, especially in the primary care setting where the range of care is diverse, and the sources and types of information may vary widely" (Howard et al. 2013, p.111)

Goh et al. (2011) also study HIT's influence on routines in healthcare. They identify three stages. The first stage is the pre-implementation. In this stage, the users form symbolic expressions about the new system even before they interact with it. In the next stage, the transition stage; focuses on the transition to the new system. In the study of Goh et al. the symbolic expression, prior to the go-live date, was positive, but after changed to negative, mainly due to two reasons: loss of performance and missing features. The last stage is the refinement phase where the users began to fine-tune routines and explore new capabilities in the system. In this phase, *performance improvement* began to be the symbolic expression associated with the system (Goh et al., 2011). In the study, an acclimatization of the healthcare professionals' work practice is observed, as they begin exploring the capabilities and, with time, begin to associate the system with improvement.

Theme 3. Standardization and Data Sharing

Among the barriers is the communicative part of the interoperability of the system being able to work with other systems (Saleem et al., 2015; Bonacina et al., 2011). To better aggregate and integrate systems some form of standardization is needed. This can be difficult given that much of the work practices are unique. Standardization and data sharing depend on shared systems and terminology.

The question then is if it is possible to have both; shared standardized methods across disciplines without disrupting the workflow negatively in the long run.

In an ethnographic study, Winman and Rystedt (2011) examined the practical work of organizing, selecting, and structuring information in EHR in a transition from paper to digital when nurse's handover shifts. The argument made is that more efforts should be put into investigating how healthcare professionals share the knowledge needed to turn information into something relevant. Standardization is not merely about codifying information. Standardization and information sharing requires knowledge of *how* to codify. If there is no unity in the *how* - the interpretation of the data becomes much more challenging, affecting the whole organization. Therefore, a shared conceptual framework can by itself not provide the solution for interoperability and knowledge of *how* is necessary for the system to provide the important coherent information to the receiver. (Winman and Rystedt, 2011).

Moving a healthcare organization from a non-standardized to a standard based information system can be a challenge. Detwiller and Petillion (2014) studied a four-year initiative to implement a new clinical information system with standardized terminology. Among the lessons learned from the project were: "It takes time and collaboration to develop standards across a large health authority" (p.272) and "It is difficult to standardize a clinical information system if clinical practice is different." (p. 273)

A prerequisite for better and faster interpretation of data cross sectors is limiting narrative text and moving to semi-structured coded form. Many clinicians have a preference for the narrative form due to its ability to enrich facts, the familiarity of use, and the freedom to express anything they wish (Amato et al., 2015). Furthermore, with the aim of better patient data sharing also introduces security questions. The patients' confidentiality and great sensitivity of the data need to be assessed when sharing data across a large distributed and heterogeneous context with healthcare professionals of various roles (ibid.)

Theme 4. Technology and Coordination

Other than the socio-technical complexity of incorporating EHR's into the dynamic work practice of healthcare professionals, some barriers are allocated primarily to the technological and coordination domain. When exploring human factors engineering Saleem et al. (2015) points out various barriers

for implementation when evaluating three different clinical information systems for intensive care units and anesthesia record keeping. Among the barriers are integration issues with other software systems, poor usability, software challenges, and hardware challenges.

In a literature review by Lluch (2011), she identifies organizational barriers to ICT adoption by healthcare professionals. One barrier is the structure of healthcare organizations. The structure of the healthcare organizations is in itself a barrier due to its often hierarchical system and lacking in teamwork and cooperation. Elias et al. (2015) also identifies the traditional hierarchical decision-making processes as not allowing for new patient-centered care models and supporting interprofessional teams in the implementation of EHR. Proper training and training concerns are also a problem (Hansen et al., 2019b; Sano and Alexander, 2020; Noblin et al., 2013; Embi et al., 2013). The need for better training appeared to be especially high in Noblin et al. (2013) case study of EHR implementation as it affected many of the themes found related to the implementation of the EHR. Other than training there is a need for proper support (Hansen et al., 2019b; Saleem et al., 2015), not only technical but also in leadership and management (Detwiller and Petillion, 2014).

3.2.3 Overcoming the Challenges

Living in a techcentric era (Schmidt et al., 2019), the introduction of new technology is constantly, and the information system will be on the agenda for decades and include billions of dollars (Hansen et al., 2019b). A successful implementation includes various factors that complicate the process (Saleem et al., 2015; Lulch, 2011). Complexity among HIT technology is not only caused due to technology but to a great extent influenced by social factors (Hägglund and Scandurra, 2017). HIT includes many actors in various organizational layers with different views, needs, and understanding in relation to the technology (Hägglund and Scandurra, 2017). A nurse's view on an EHR differs from a practitioners', which differs from how a technology vendor or developer sees the technology (Qian et al., 2019).

There is not one correct template for EHR implementation (Hägglund and Scandurra, 2017), but includes multiple aspects which needs to be considered (ibid.). Simultaneously, a *simple and small* change can, in the eyes of the technology developer, change the end-users work practice (Qian et al., 2019.). Aanestad and Jensen (2013), describes how the incorporation of the EHR systems' capability to import scanned files into the system, created a need for redesigning the work processes, even though the extension of the system was seen as a minor functionality.

Overcoming these barriers of complex large-scale implementation of EHR, have throughout this structured literature review concluded on the following findings as aspects to take into account for a successful adaption: *collaboration* (Hägglund and Scandurra, 2017; Mogensen, 2019; Chao, 2016), *patience* (Hertzum and Ellingsen, 2019), *education* (Bonacina et al., 2011; Borycki et al., 2016), and *user incorporation* (Unertl et al., 2012; Tang et al., 2018; Rojas and Seckman, 2014; Howard et al., 2013).

Theme 5. Patience

Hertzum and Ellingsen (2019) compared the implementation and preparations of an EHR system in Denmark and the UK as preparations before the implementation of the system took place. It took 6-12 months in the UK before the productivity was as post-implementation, whereas in Denmark it took 18 months, "... in spite of the expectation that the productivity dip would last only three weeks" (ibid., p.315). As it shows there is a need for patience towards a large-scale implementation, simultaneously with a realistic connection between expectations and reality (ibid.). Furthermore, Howard et al. (2013) argue that an EHR system impacts differently according to which work practice it gets incorporated in; one-size-*does-not*-fit-all. Implementation of EHR systems demands patience before the system can be a productive part of the work practice (Hertzum and Ellingsen, 2019; Howard et al., 2013).

Theme 6. User Incorporation

Throughout the literature review user incorporation is seen as one of the most important triggers to a successful EHR implementation. This is because the incorporation of users contributes to knowledge of the context, which the technology is implemented in (Unertl et al., 2012), and the work practices and routines it changes (Howard et al., 2013). User incorporation, therefore, contributes to the knowledge of the conflicting stakeholder needs that establish context-based decision-making (Elias et al., 2015). "... the problems of developing technology for healthcare lie not with the complexity or novelty of the technology itself, but in the complex way healthcare is practiced and organized" (Baxter and Rooksby, 2011 in Hägglund and Scandurra, 2017 p.4). As the quotation suggests the social aspect in technology implementation is fundamental.

In an evaluation of the implementation of an EHR system in a Danish hospital, Nørup and Hansen (2015) argue that the lack of focus on user participation has consequences. If the users have not been assigned with the requisite resources to learn the system, it can induce an incomplete and unfinished implementation, since an assembly of the social and technology needs have not been met. (ibid.).

Hansen et al. (2019b) had similar findings in their article about management changes of an EHR system, which focuses on four different management styles to help EHR implementation. Outlined hypotheses were thoroughly researched, where the focus of the third hypothesis was that involving employees in the local adaptation will make beneficial results in proportion to the system and the use of it. This management style with employee incorporation successfully created users who were positive about the adoption of the system into their work routines (ibid.).

User incorporation can help recognize black box areas in which decision-makers without the same expertise are not able to understand. Thereby a more context-based outcome will be implemented. In other words, the technology should reflect the end-users work practice, and not the other way around (Rojas and Seckman, 2014). "Experts from all disciplines and specialties affected by proposed EHR implementation should also be included in the evaluation process to ensure that all stakeholders provide input to system design" (Rojas and Seckman, 2014 p.219*).*

Ilie and Turel (2019) argue that the consequences of the lack of a positive understanding and use of an EHR system by the end-users, will lead to them oppose the fundamental functions of the system, and instead work their way around. This conflicts with the purpose of the EHR system since they are supposed to streamline data, and the process of documentation (Tang et al., 2018).

Theme 7. Collaboration

The aforementioned aspect of user incorporation is closely related to the collaboration aspect found in the literature review. In the study of the implementation of the EHR system, Columna Cura in the municipality of Esbjerg in Denmark, Mogensen (2019) concludes that a favorable culture of collaboration in the organization and with technology vendors is important. This is due to the possibility of redesigning or adjusting the system according to the requirements by the municipality (ibid.). Mogensen here turns to Poon et al., (2004), who argues: "The vendors must be ready to identify… workflow issues and adapt its product accordingly" (p.88). The purpose of the collaboration is therefore to minimize the gap between experts and create a system based on the

needs of the context. Furthermore, Kim et al., (2016) argue, in a study focusing on factors influencing healthcare personnel's use of Electronic Medical Records, that a contextually sensitive understanding leads to a: "... stronger relationship between new technology and work performance was associated with a greater influence on the end users' behavioral intention to use, end-users used it to improve their work efficiency." (p.10) A collaborative environment can according to the literature be recognized as beneficial for actors involved.

Theme 8. Education

According to the concept of education in relation to EHR, it revolves around educating the end-users of the system. Borycki et al. (2016) suggest that educating undergraduate students about EHR is a way around the lacking understanding of HIT and EHR. "With the modernization of healthcare organizations, there has emerged a pressing need for a workforce that can design, develop, implement and maintain health information technologies found in healthcare organizations" (Borycki et al., 2016, p.635).

When implementing EHR systems Hansen et al. (2019b) argue: "... it is also important to prepare employees for the difficulties that almost always arise when implementing large ICT systems" (ibid., 104). In addition, according to Colligan et al. (2015), it is important to provide users who have problems understanding and navigating the system with additional learning sessions, to help them interact with the system and thereby avoid physical, mental, and emotional exhaustion of the users. Education based on the work practice of the end-users creates a more context-specific learning environment, which instead of a standardized teaching aspect, contributes to a positive attitude towards change (Nørup and Hansen, 2015). An EHR system is a communication channel working as an intermediary knowledge object with the purpose of sharing patient observations, history, and health status between practices, therefore, a standardized method of documentation is essential (Chao, 2016). Even though healthcare is based on an ad hoc approach, where clinicians and other healthcare professionals act based on the patient's needs, there is a need for consistency in work practices and the practice of documentation (ibid.). Therefore, Nørup and Hansen (2015) argue the need for a balance between standardized and context-specific education. Similarly, Lluch (2011) suggests the need for teaching IT skills as important in adopting a HIT system, whereas the absence of such skills is concluded as a barrier to an effective workflow.

3.3 Summary of the Structured Literature Review

The literature regarding the implementation of EHR systems is comprehensive. It is a field with specific theories and approaches. Much of the literature is related to the transition from paper to digital in a hospital setting. Predominantly the methods were qualitative and often ethnographic. As ways to overcome the challenges, user-involvement and acknowledging and learning from the specific context was emphasized. Furthermore, recognizing the socio-technical difficulties of implementing EHR was also a prevailing theme. However, a limited number of papers focused on a context outside a hospital setting. No articles were centered around the social psychiatry work practice in the primary sector. This sector is also an important part of the healthcare system and literature on the impact of EHR systems and standardization is crucial. It is within this knowledge gap that we aim to contribute. Using concepts and knowledge of the literature review we will be building and adding to the growing field of EHR implementation literature.

Participatory elements are useful and promising tools to overcome the difficulties in involving the user and establishing learning across-boundaries (Qian, 2019; Hansen et al., 2019b; Rojas and Seckman, 2014). This thesis will build upon this part of the literature and ask the question if user-involvement and participatory design elements can be done digitally to facilitate quick and proper feedback regarding the implementation of EHR.

4. Methodology

This chapter will describe the methods used and how it has been translated into action. Furthermore, will the methodological considerations be described as well as the underlying research design, tools and techniques, data collection process, and the fundamental thoughts and purpose of the used methods.

The methodological choices were influenced by COVID19 precautions. In this project, the pandemic has been categorized as an obstacle that required an innovative and creative solution, which will be presented in this chapter. COVID19, therefore, acted as a catalysator for creative constraints on our methodology. This has led to a deep dive into a new and promising method of data gathering. This approach looks beyond what a regular interview can be and utilizes new tools of the digital age to explore the possibilities of an online workshop as a supplement to EHR assessment. We hope that this study can help shed light on the methodology and the promise it holds for research as we reflect and discuss this method.

4.1 Research Design

This research has its outset in the constructivist framework of research design. Creswell (2009) describes different frameworks, or *worldviews*, in outlining the methodological standpoint. A constructivist design seeks to understand the worldview of its participants. Creswell describes it as relying as much as possible on the view of the participant and the situation being studied. The methods used are qualitative and interpret the experience generated in the field with the participant. "... individuals seek understanding of the world in which they live and work. Individuals develop subjective meanings of their experiences—meanings directed towards certain objects or things" (Creswell, 2009 p. 8). The intention for the researcher is to understand and interpret the meanings of the participants' worldview, knowing full well that historical background, discourses, power relations, micro-sociological circumstances, as well as the researches own presence in the field plays a part in the participants subjective understanding of the world (Creswell, 2009). Working inductively the researchers generate patterns of meaning or develop a theory. This approach is present when we evaluate Cura and try to understand its impact on the lifeworld of the participant.

We analyze and interpret the meanings towards the technology in practice and on that basis generate patterns and themes about the worldview of the participant.

Constructivist Framework and Assessment

The constructivist framework is present in this report as we interpret the participants' view of Cura in a socio-technical assessment of the system. The constructivist framework often stops the analysis after interpreting and is criticized by the more action-oriented designs because: "... the constructivist stance did not go far enough in advocating for an action agenda" (Creswell, 2009, p.9). Action-oriented research designs actively advocate for advancing an agenda for change. For these reasons, the action-oriented framework can be understood dialectic in being actively involved and focusing on bringing about change in the field (Jacobsen and Jørgensen, 2007). It is the goal of this thesis to identify crucial elements in the Cura implementation process and advocate for change or suggest an agenda for change. Furthermore, this thesis not only researches the implementation of Cura but also reflects upon the methods used as a meta-study. Thereby contributing to the growing literature of EHR implementation and ways in which assessment can be done; highlighting shortcomings, benefits, and advantages of Voice over Internet Protocol (VoIP) combined with desktop sharing. Online interview and mediated interaction are considered a new *methodological frontier* (Weller, 2017). Therefore, we find it necessary to discuss and reflect upon the methodology to benefit researchers interested in this approach.

4.2 Data Overview

Table 3 shows a timeline with the purpose of outlining the dates, informants, methodological tools, and digital platforms. The table also visualizes the empirical data gathered prior to the start of the project period of this thesis, which is a result of an internship at Hjørring Municipality (Droob and Rasmussen, 2019). At the internship, we became aware of numerous municipal workers who were affected by the implementation of Cura in the Handicap area. Out of curiosity, we started researching the implementation process. This included communicating about the system with administration employees at town hall during cafeteria lunch breaks, observing training sessions as well as investigating the various expectations towards the system.

	Date	Informants	Methods		Date	Informants	Methods
1	16/9 -19	Social worker and manager at RA *(Employee E and department manager A)*	Interview	11	13/1 1-19	Staff and social marginalized people at DC	Observation
2	18/9 -19	Manager at RA *(Department manager B)*	Interview	12	21/1 1-19	Staff and residents at RA	Observation
3	26/9 -19	Cura network meeting; lecture about Cura	Observation	13	26/2 -20	Social worker and manager at RA *(Employee E and department manager A)*	Interview and PD assignment
4	30/9 -19	DC manager	Interview	14	26/2 -20	Social worker (superuser) and manager at RA *(Employee D and department manager B)*	Interview and PD assignment
5	4/10 -19	Former project manager of Cura *(EHR-team project manager B)*	Interview (lecture on the use of Cura)	15	3/4 - 20	Cura full-time superuser at DC *(Employee A)*	POVA (Zoom.us)
6	7/10 -19	Staff and residents at RA	Observation	16	14/4 -20	Cura project manager *(EHR-team project manager A)*	Interview (Microsoft Teams)
7	17/1 0-19	Staff and residents at RA	Observation	17	14/4 -20	Social worker at RA *(Employee B)*	POVA (Skype)
8	21/1 0-19	Cura network meeting; lecture about Cura	Observation	18	17/4 -20	Nurse (superuser) at RA *(Employee C)*	POVA (Microsoft Teams)
9	28/1 1-19	**Cura Go-Live in Hjørring Municipality**		19	27/4 -20	Social worker (superuser) at RA *(Employee D)*	POVA (Microsoft Teams)
10	13/1 1-19	**Cura Go-Live in Aalborg Municipality**					

Table 3: An overview of the conducted fieldwork, interviews, and online workshops.

We have contacted all the department managers of residential accommodations in Hjørring municipality. The process of finding informants who were able to participate in our research has been identified through an *ask users to identify users* approach (Kanstrup and Bertelsen, 2016), where the department managers pointed out who would be interesting for us to interview. This also means that we on several occasions have been redirected to different informants before scheduling a final date. The informants of this research were: social workers at RA and DC, the former project manager of Cura, the current project manager of Cura, a DC manager, and two RA managers. Furthermore, did the following informants participate in the POVA workshop described in chapter 4.3: two social workers from different RAs, a nurse from a RA, and a full-time superuser at a DC.

4.3 Qualitative Research

> *"The way in which people being studied understand and interpret their social reality is one of the central motifs of qualitative research." (Bryman, 1988, in Ritchie and Lewis, 2003, p.8).*

To gain knowledge upon the worldview and the social reality of the actors which are being studied in this project, the use of qualitative research methods have been centralized as a result of the constructivist framework.

Interview Format

The interview is a useful method to gain knowledge about informants' opinions, positions, and experiences (Brinkmann and Tanggard, 2015). Therefore, the interview method has been used to create a social production of knowledge, about the informants' worldview (Brinkmann and Tanggard, 2015; Bryman, 2016).

According to Brinkmann and Tanggard (2015), the semi-structured interview requires the interviewers to have prior knowledge of the area of focus. Therefore, it was important to acquire knowledge based on Cura by studying the learning material. This material showed how to navigate and use the system and was the original material that the front staff were presented with. Furthermore, we attended a tutorial lecture from the former project manager of Cura, which included hands-on experience. This pre-understanding of the system became an inevitable element asking relevant questions about the context, instead of questions about how the system works in general.

4.3.1 Participatory Design

The following section will describe Participatory Design (PD). This methodology has been the main aspect of this study, due to its ability to emphasize the users' voice and focus upon their worldview. We will describe the underlying tools and techniques used as well as reflections upon doing (PD) inspired research online.

PD dates back to the 1970s, where it became a part of the workplace democracy movement (Simonsen and Robertson, 2013). PD introduced workers with tools to support their practice in relation to the institution of digital computers. Simonsen and Robertson describe PD as:

> *"a process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective 'reflection-in action'. The participants typically undertake the two principal roles of users and designers where the designers strive to learn the realities of the users' situation while the users strive to articulate their desired aims and learn appropriate technological means to obtain them" (p.2)*

The aspect of collaboration between designers and users is an essential part of PD. The outcome of a PD process is to narrow the distance between designers and users and deepen the collaboration between the professions by incorporating people in the design process, where the technology is supposed to be implemented (ibid). Through PD the end-users receive a voice in the design process and become a centralized and fundamental part of the development. The following quotation is a summarization of the main aspects of PD:

- "Mutual respect for different knowledge (workers and designers)
- The need to create opportunities to learn about the other's domain of knowledge (workplace and technical)
- A commitment to joint negotiation of project goals (not driven solely by a technical or workplace agenda)
- A dedication to develop tools and processes to facilitate participation"

(Blomberg and Karasti, 2013, p.88)

The advantages of PD are centered around the idea of mutual learning; creating a space wherein users can have their voices heard without knowing a technical language (Simonsen and Robertson, 2013). PD is about design, but equally important is its concept of creating a democratic process.

> *"Most importantly, Participatory Design has always given primacy to human action and people's rights to participate in the shaping of the worlds in which they act." (Simonsen and Robertson, 2013, p. 4)*

PD has a democratic and empowering process and can enable and strengthen disempowered groups in improving internal processes (Muller and Druin, 2012). This study does not focus directly on design but concentrates on the involvement of the users of Cura, and how the system has changed the work practice of the social workers.

4.3.2 Tools and Techniques

It is a central aspect of PD to pioneer within design approaches with end-users. The PD approach attends to numerous design practices with a variety of *toolboxes* for engaging users in *telling, making, and enacting* (Brandt et al., 2013).

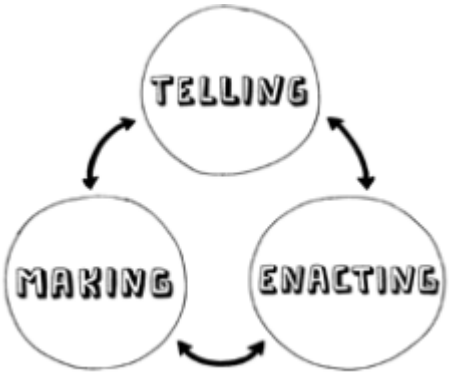

Figure 4: (Brandt et al., 2013 in Sanders, 2013). Tell-make-enact. By combining these activities each element fuels the next. E.g. by telling a story, then enacting it in some way, and finally making it out of LEGO for instance.

This philosophy combines tools and techniques as ways to engage participants to tell, make, and enact. By combining these elements, even people who are not skilled in one of the elements can be empowered to express themselves creatively (Sanders, 2013).

Brandt et al. (2013) specify that the techniques and tools must be adjusted towards the context of the study. In this study, the conducted observations in fall 2019, worked as a method to get an insight into the social workers' practice, and thereby adjust the techniques.

The techniques used in this study is: Photography exercise, Sorting and scoring, and Client Journey (see 4.5)

4.4 The Underlying Technology

Voice over Internet Protocol

The interviews and workshops conducted in April 2020 were held online through Microsoft Teams, Zoom.us, or Skype depending on which platform the informants preferred. Lo Iacono et al. (2016) describes such technologies as Voice over Internet Protocol (VoIP) which is a: "... system which provides users with a way to send voice and video across the internet via a synchronous (real-time) connection" (p.1). The use of VoIP technologies broadens the range of participants and the possibility to include more people in the research due to it not being dependent on a physical presence (Lo Iacono et al., 2016). This fits well with the inclusive and democratic principles of participatory design (Simonsen and Robertson, 2013). Lo Iacono et al. uses Skype as a method to interview people across borders, and thereby transcend geographical boundaries (ibid.). Due to COVID19 the borders and boundaries were similar since face-to-face interviews were off-limits.

The three online platforms of VoIP were chosen due to their options of video communication, user-friendliness, video recording, and the ability to share screen. Video communication was the number one priority since it has similarities towards the classic face-to-face interview because of the visual element it includes (Bryman, 2016).

User-friendliness was an aspect of severe importance since the informants' familiarity with VoIP technology was a barrier (Lo Iacono et al., 2016; Bryman, 2016). James and Busher (2012) argue that doing online interviews requires computer literacy and basic technology expertise both from the researcher and informant. In the interviews and observations made prior to this study, it was vocalized by the RA and DC managers as well as the staff members themselves, that they were not very familiar with VoIP technologies. Therefore, we asked the informants which VoIP system they preferred before each interview. This allowed them to choose a system they were familiar with.

The first informant did not have any preferences, and we, therefore, chose to use Zoom.us. To secure a smooth less online access we sent out a step-by-step guideline on how to use Zoom.us (Appendix B). Despite the guide, the informant was not able to connect to the meeting because of the secure municipal internet browser she was connected to. The secure browser blocked her microphone and webcam and therefore had to change to another internet browser. Another informant had her son help her set up a Skype meeting, whereas the last two choose Microsoft Teams, where one of the two

had a colleague help her with the setup. In addition to the VoIP platform, another aspect, which must be considered beforehand, is what device the informant wishes to access the meeting (desktop computer, laptop, smartphone, tablet). *Does the device have the necessary features, such as a webcam and a microphone?* One of the informants tried to access the meeting through a desktop computer without a webcam or microphone. It would be possible to have the interview without a webcam, but the microphone is an essential part. This shows the underlying technological qualifications that the use of VoIP technology demands.

Before the online meetings, the VoIP technology and related questions were tested on a fellow student. It was experienced that even when only three participants were connected to the same meeting (the student and the two researchers of this study) it caused challenges when a researcher and the student talked at the same time. It was therefore decided that only one informant at a time should participate in the workshop contrary to conducting one workshop with all informants together.

Online Desktop Sharing

Besides the use of VoIP technologies, the desktop sharing feature has been an important part. The opportunity to *share screen* with the informants made it possible to show the informant visualizations, which were used in a Client Journey inspired technique described in 4.5. The software program "Microsoft Whiteboard" was used to create a digital whiteboard.

4.5 Participatory Online Video Assessment Method

Participatory Online Video Assessment (POVA) is the name we have chosen for our assessment method. This section will describe the various elements in POVA.

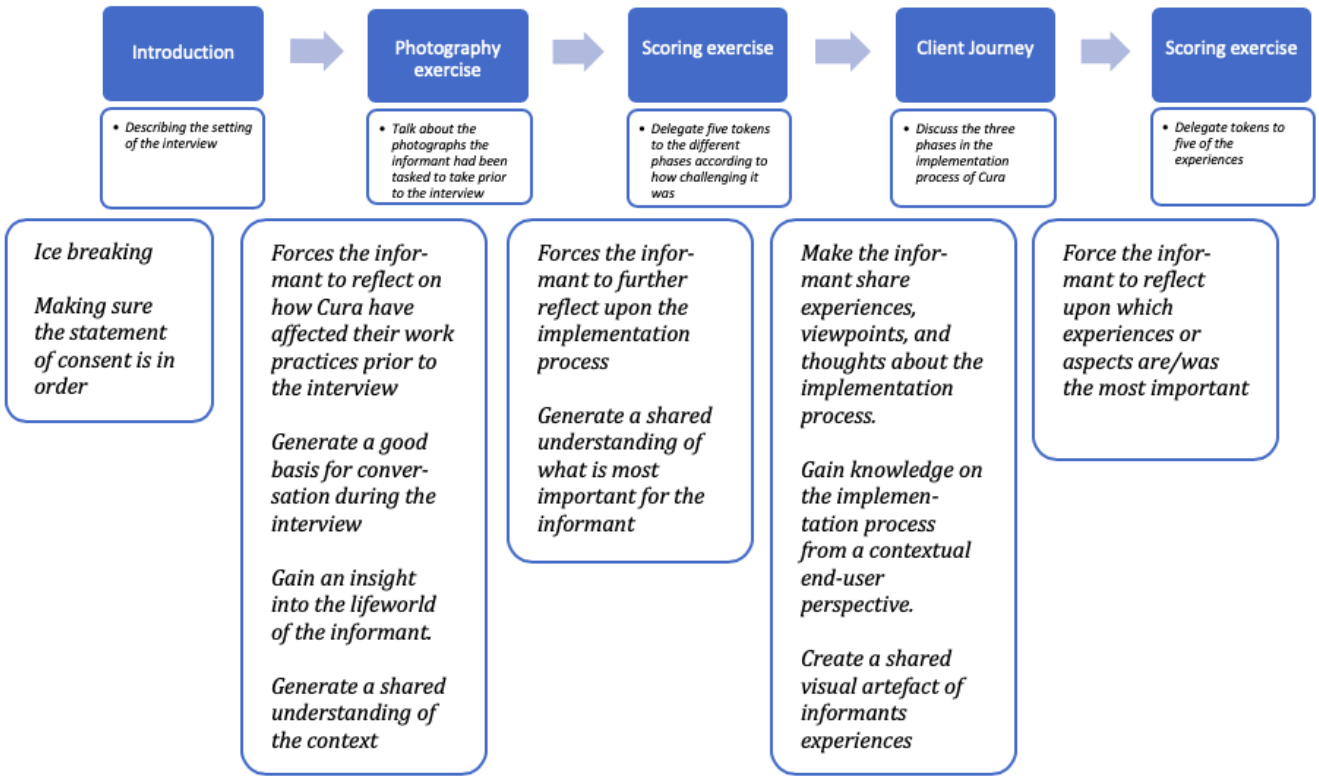

Figure 5: This figure shows the process of the POVA method. The blue boxes illustrate the exercises, where the boxes below describe the purpose and reasoning behind them.

Before the POVA, the informants were tasked with a photography exercise. The photos were the first topic of discussion during the interviews. The next phase of the interviews was the Client Journey. First, the participants were tasked with delegating tokens to each phase (Before, Go-live and Now) according to how difficult they experienced the phases. Hereafter, each phase was discussed while one researcher was asking questions and the other was inserting post-its, summing up the talking points on the digital whiteboard. The participants were asked if the post-it was representative. Next, the participants were tasked with selecting five post-its from all phases to represent the most crucial elements for a future similar implementation.

The following sections will describe each element of the POVA.

Photography Exercise

As figure 5 shows, the first part of POVA was a dialogue based on the photographs taken by the informant; asking questions such as: *Can you talk about the story behind this photo? Why did you take this photo? What does this symbolize*?

This task revolved around the following:

- The informants must take a maximum of five photos
- The photos must show situations from the informants' work practice where the implementation of Cura changed the work processes
- Before the date of the interview, the photos were sent to us via email
- There are no right or wrong photos. The photos taken and what they symbolize must be a subjective decision made by the informant.
- The photos can be taken with for example a smartphone.

As the outline of the task suggests, the informant was tasked with taking a maximum of five photos.

This was decided to make the informant consider which part of their work practice was affected most by the implementation of Cura. The exercise, therefore, forced the informant to reflect upon their work practice in relation to Cura prior to the POVA.

The photographs were used as a stimulus for questioning (Bryman, 2016) about the work practice of the informants. It worked as a method to clear some of the distance there is between researcher and informants, by creating a context-sensitive area. The photography task acts as a *cultural probe* which is: "... collections of evocative tasks meant to elicit inspirational responses from people" (Gaver et al., 2004, p.53, in Blomberg and Karasti, 2013, p.101).

> *"... probes are thought to be particularly useful in settings where a more traditional ethnographic engagement (e.g. through interviews and observations of daily life) would have been difficult" (Blomberg and Karasti, 2013, p.101).*

The approach, as well as the arrangement of the method, was inspired by Bertelsen (2007), and her study of the work practice of medical secretaries. The medical secretaries were equipped with disposable cameras, whereas they were told to take photos of their work practices. The photos emphasized numerous invisible work tasks connected with the work as medical secretaries.

In this project, the photos created an opportunity for in-depth questions about the artifacts and situations which were visualized in the photos (Bertelsen, 2007). The method implicates an

opportunity to involve situations that may not occur every day (Bertelsen, 2007; Bryman, 2016), and therefore could be difficult to comprehend in short time-limited fieldwork.

As it is visible in figure 5, the photography task was the first part of POVA, since: "Stimulating interviewees to engage visually with familiar settings and objects may help them to think in different ways about things that they take for granted". (Bryman, 2016, p. 476). The use of photography worked as a technique to ensure an easy-going and familiar setting.

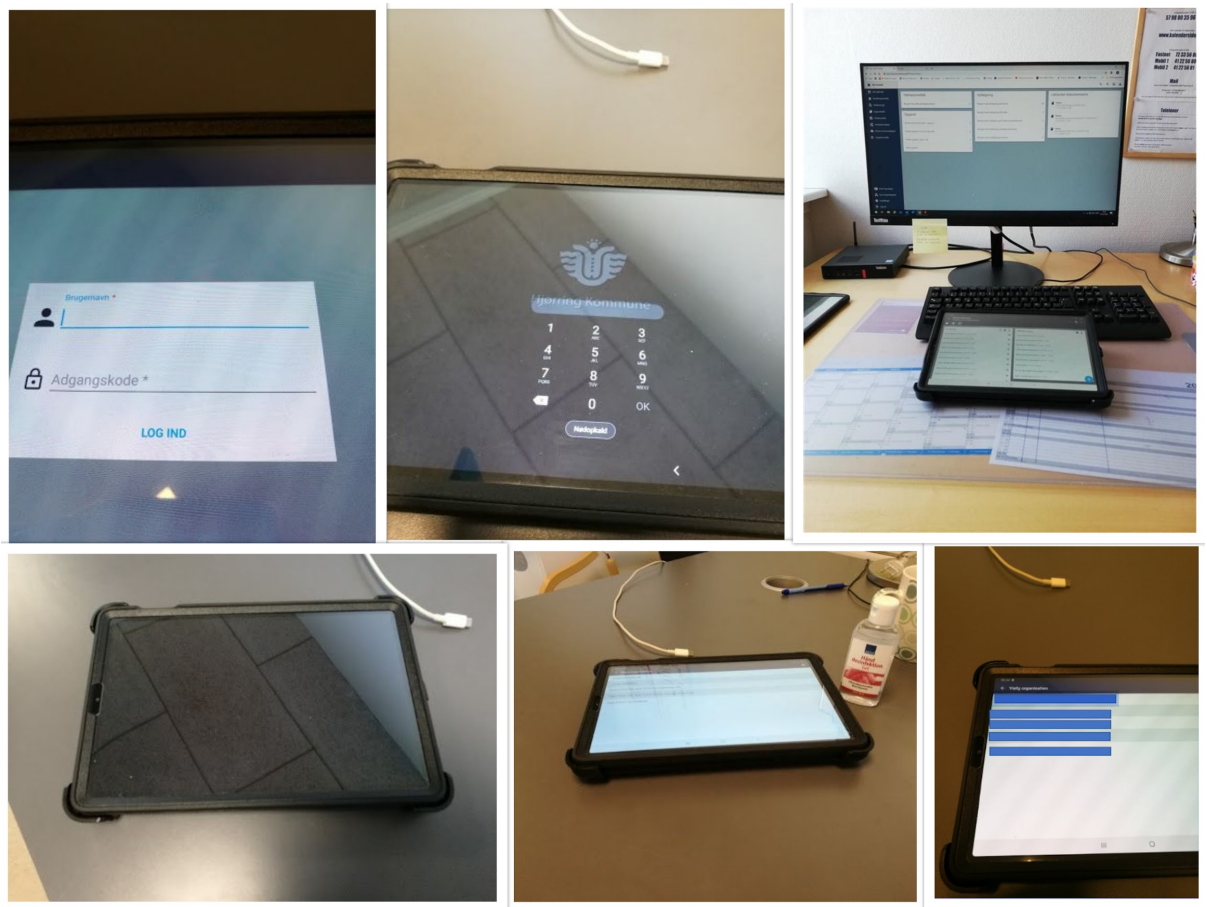

Figure 6. This figure is a collage of the photographs taken by the informants

Some participants were not able to take any photos of their work practice due to them working from home because of COVID19. Instead, we tasked them with making a list of five items.

Client Journey

This part of POVA was inspired by Kanstrup et al. (2017). In Kanstrups research of designing hearing healthcare solutions, the use of a Client Journey (CJ) acted as a framework of the healthcare journey

that a person with a hearing impairment has to go through, from the preparation phase until the hearing aids are established (ibid.).

In POVA the CJ was arranged with similarities to Kanstrup et al. A timeline aspect was used as well but in the context of EHR implementation in RA and DCs. As it is visualized in figure 8 is the CJ based upon three phases: *Før* (before the implementation), *Go-Live* (a week before and after the official go-live date), and *Nu* (Now; as pr. date of the interview).

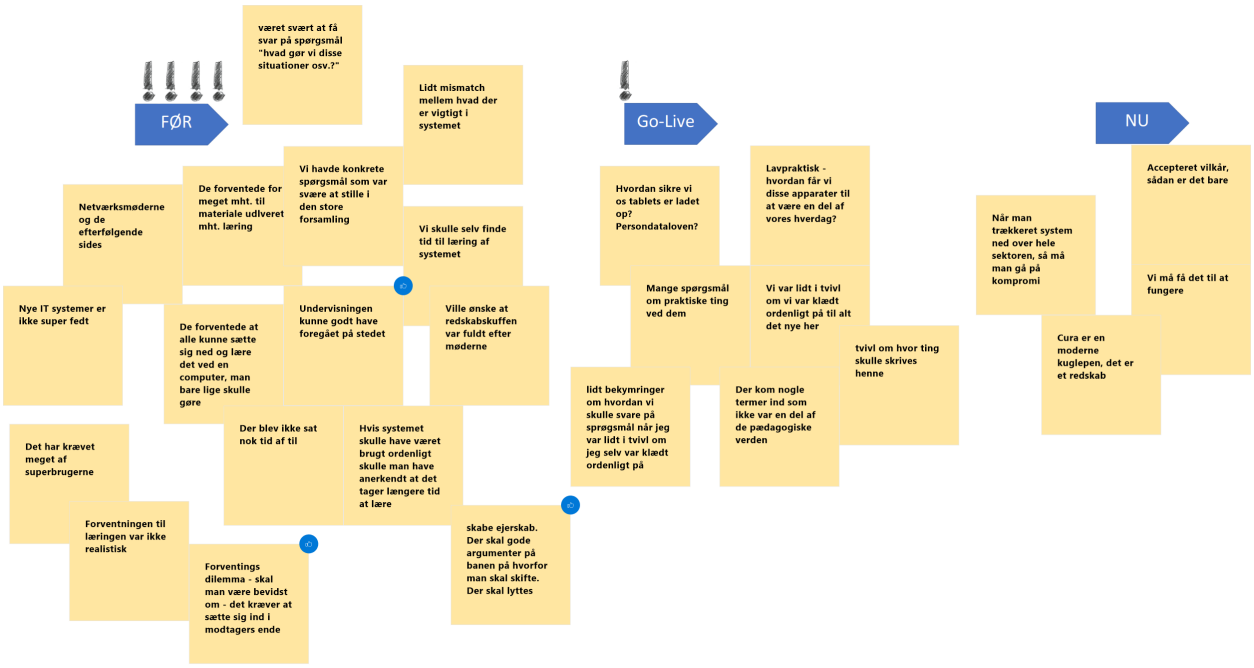

Figure 8. A screenshot of a final Client Journey

The CJ, in this thesis, can also be seen as an elaborate way of using the anthropological technique; Grand Tour. Spradley (1980) describes the core concept of Grand Tour as: "... the common experience of having someone show us around their house, place of business, or school" (p.77). The aspect of guiding or showing someone around is an important tool in this research. The purpose of the CJ is to create an environment where the informants can *give us a tour* of their experiences during the implementation of Cura. *Space, time, people, activities, or objects* (Spradley, 1980) are important aspects that the informant can use to describe a contextual scene. We, therefore, used the CJ to let the informants describe their experiences in relation to time (Before, Go-live, Now), whereas aspects such as people, activities, and objects were discussed within these phases.

Sorting and Scoring Using Tokens

A subtle, but important part of POVA, was asking the participant to rank or highlight different situations. In the sorting exercise, the informant was asked to distribute five tokens to the three phases of the CJ (Before, Go-live and Now) as the first thing after the photography exercise. These tokens represent how difficult the informant experienced each phase. Via these artifacts, mutual learning between researchers and informants was the main objective. Visually all participants could see the distribution of tokens and initiate a dialogue about why the tokens were distributed the way they were. The tokens acted as simple yet powerful tools for learning and dialogue.

Figure 8. A screenshot from POVA showing the token distribution of the three phases (visualized with the exclamation marks). The post-its are sorted with a blue "thumbs-up" token

The last sorting exercise takes place after post-its have been placed on the client journey the participant was tasked with selecting five of these post-its which represented the most important elements for a future similar implementation. The benefit was to force the participant to choose and sort through all these journey details and thereby convey their experience through the artifacts and facilitate better understanding between researcher and informant.

4.6 Making Rapport over VoIP

In qualitative research creating *rapport* matters, a harmonious connection between the researcher and informant is necessary for successful communication, and an established element in qualitative interviews (Kvale and Brinkman, 2009; Weller, 2017). This section will discuss the creation of rapport during the POVA and the implication for the online vs. co-present format.

Transition Phases

When doing online interviews, contrary to co-present interviews, little time is spent with the informant prior to the actual interview start. In three of the four POVA workshops, no prior face-to-face interaction had taken place, only email correspondence. In a co-present interview, handshakes, small talk, and providing refreshments are a natural, but necessary basis of creating rapport. These small activities are not possible online. The handshake can be substituted with a wave but does not have the same connection power as the physical and culturally embedded handshake. Casual talk prior to the actual interview start was often substituted with ensuring audio and video quality was acceptable and that the letter of consent was approved. We felt it necessary to engage in casual conversation prior to the actual start, therefore we deliberately used a couple of minutes for casual conversation for this reason. However, the time from established video-connection to actual interview start was short (approximately 5-10 min.).

In a co-present interview building rapport can be done by engaging and taking interest in the surroundings. This has the dual upside of getting a peek into the lifeworld of the informants and creating a natural and easy transition to the actual interview start. Building this type of rapport in mediated and online settings can be challenging. Deakin & Wakefield (2014) and Seitz (2015) suggest that email correspondence and photography exchange can lay the groundwork for such rapport before an interview.

In qualitative interviews, *leavings* are as important as *greetings* especially for fostering long-term connections (Weller, 2017). These conversations and drawn out leavings ensure that the informant has had a good experience. Leavings are quite different on online platforms. Ending an online interview is often not drawn out and ends by wrapping things up, thanking the informant, followed by a press on the 'red button'. The transition from normal-setting to interview-setting and back again to normal-setting is very abrupt; very little transition is involved contrary to traditional interviews.

The value of the transition phases must not be underestimated. When doing online interviews, especially with informants not met prior, some emphasis must be put into transition phases, as these do not emerge as naturally as in traditional interviews.

Fear of Presence

Weller (2017) describes how her informants often felt more comfortable with mediated forms of communication as they were experienced as 'less daunting'. The online format removes the 'fear of the presence'. In this research further evaluation is needed to assess whether this was the case, but the online format did not seem to function as a barrier for good communication.

In traditional interviews the recording device is always present, acting as a constant reminder *that everything you say is being recorded*. This device is hidden in online interviews. Rettie (2009) argues how "...mediated interaction is shaped both by the temporal characteristics of the medium and by normative framing expectations." (Rettie, 2009, p.436). Meaning that the conversation takes different forms depending on the medium (e.g. Phone, Skype, text messages, etc.). This highlights a great potential for remote methods as they, instead of being second-grade options, have advantages over the co-present counterpart as fear of the presence for instance can be reduced.

4.7 Transcription and Coding

Every interview and POVA workshop in this study either video- or audio-recorded and afterward transcribed. The video-recording was used to not only examine what the informants say but also in the way they express themselves (Bryman, 2016).

After all interviews were transcribed, we used the qualitative data analysis software NVivo to code the data, to gain an overview. The data was transferred into the system and read thoroughly while giving specific passages of the data a code. The following tables visualize the main themes of the data and the underlying codes.

Cura now	Files	References
Work practice changes	3	7
Wishes towards teaching environment	6	15
Structure of the system	6	15
Tablets	6	16
System integration	3	4
Support	4	7
Health vs. Pedagogical terminology	6	22
Positive	6	23
Medicine	2	5
Absences and requests for the system	6	30
Role of the manager	2	8
Calendar	4	5
Documentation: Where and how?	6	27
Expectation vs. reality	7	16
Cura teaching	3	7
Cura frustrations	5	10
Use of Cura	2	8
Open system	6	17

EKJ	Files	References
EKJ vs. Cura	8	12
EKJ superuser	1	4
EKJ impression	2	2
EKJ implementation	5	7
EKJ work practice	4	14

Go-live	Files	References
Cura teaching lessons	3	8
Support	5	5
Positive	2	3
Absences in Cura	2	18
Freeze period	2	4
Frustrations	5	26

Before Cura	Files	References
Communication between social workers and the administration at the municipality	2	2
Preparation for Cura implementation	14	34
Requests for the system	4	7
Cura expectations	13	47
Cura concerns	11	18

Cura implementation process	Files	References
Technology evaluation	2	13
FSIII	3	9
Cura public procurement	2	7

Misc.	Files	References
Workaround	7	23
Unique work practice	8	17
Social workers vs. administration at the municipality	8	12
Understanding of another context	6	7
Everyday life at RA and DC	6	13
Cura observation	2	2

Table 4: Visualization and thematic grouping of the codes

5. Theoretical Framework

This chapter will outline the two main approaches to HIT assessment (formative and summative) in order to better comprehend the approach of this thesis. Second, the concept of Thought Worlds and Community of Practice will be introduced as it is useful to understand the different cultures and practices at play. These different cultures make bridging and learning across these *worlds* difficult as much of the knowledge is tacit. The last topic of the chapter deals with ways of which to bridge this knowledge.

5.1 Technology Assessment

With the development of HIT there is an increasing need for empirical evidence to prove the benefits. This evidence is important to establish the return on investment and to guide future adoptions (Kuziemsky and Lau, 2017). The purpose of assessing technology depends on where in the process the assessment takes place. "The scope of eHealth evaluation can cover the entire life cycle, which spans the planning, design, implementation, use, and maintenance of the eHealth system over time." (Kuziemsky and Lau, 2017, p.3). As an example, the researcher could evaluate if the system is aligned with the overall strategy of the organization in the planning phase. Whereas, the use-phase could focus on how the system is used and the impact on patient treatment.

This thesis will categorize evaluation models into reactive (summative) and proactive (formative) assessments. Reactive assessment is oriented towards "patch solution" and limiting adverse impact. The reason being that a reactive assessment is conducted at the later stages of the technological life cycle (see figure 9). This makes major changes difficult. A proactive assessment is conducted in the earlier stages and seeks to put forward wanted features and qualities (Nøhr, 2017).

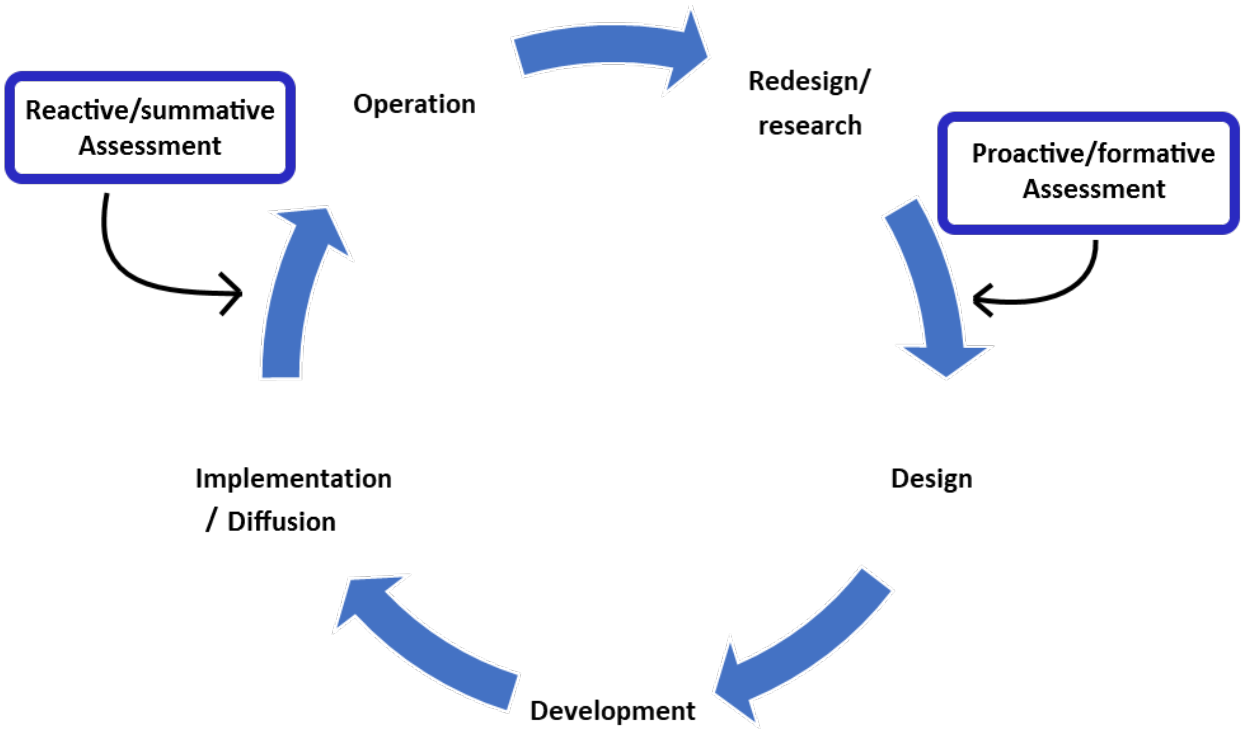

Figure 9: Shows were in the technology life cycle the two types of assessment take place.

5.1.1 Reactive

Reactive (also known as summative) evaluations for assessing technology in healthcare have been the preferred method and have been for the past decade (Høstgaard et al., 2013). Often reactive assessments are meant to provide decision support to managers. Prominent models of this type include De Lone and McLean (2003) "Model of Information System Success", and "Health Technology Assessment" (Sundhedsstyrelsen, 2007).

De Lone and Mclean Model for Information System Success (D&M IS success model). describe IS success as a multidimensional construct. It is one of the most widely used models within technology assessment (Kuziemsky and Lau, 2017). Across different healthcare settings, the model has been empirically validated numerous times in the independent field and laboratory studies (Kuziemsky and Lau, 2017; Delone and McLean, 2003; Adebowale, 2017). D&M IS success model offers six dimensions to measure IS success. These dimensions are interrelated (Delone and McLean, 2003) as shown in figure 10.

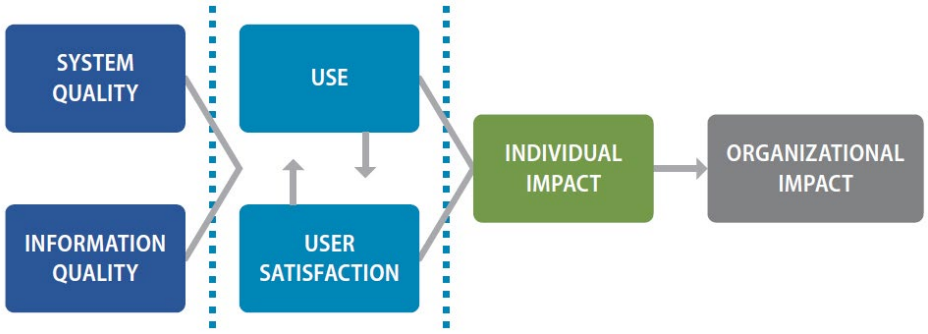

Figure 10. From Delone and McLean, (2003). The original D&M IS success model. A process understanding of IS: First a system is created containing various degrees of qualities. Next, the system is used by managers and the staff experiencing these features. Users are either satisfied or dissatisfied with the information system. This impacts the individual user in conducting work. This impact has consequences for the system and has an organizational impact.

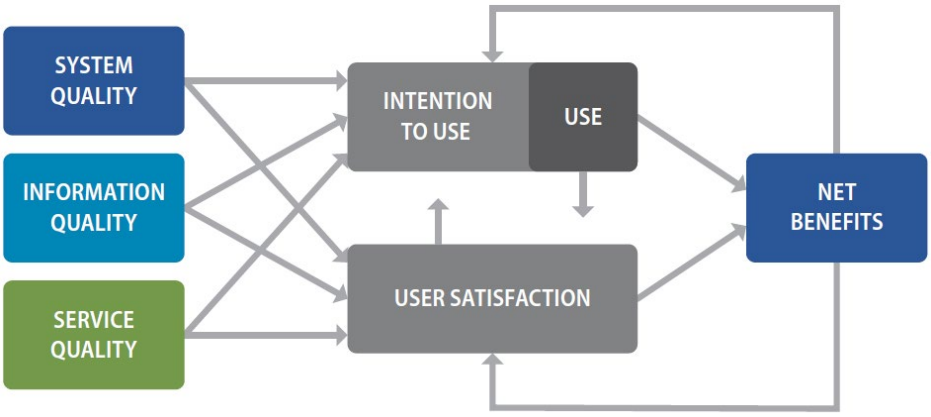

Figure 11: From Delone and McLean, (2003). The updated D&M IS success model.

The updated model, figure 11, differentiates from the original model by moving to a more casual understanding, postulating that an increase in A will cause B to increase (or decrease). D&M IS success model is excellent in describing factors that influence IS success. The model does, however, not make any mentions of organizational and contextual factors which is an implication of the model as "…organizational and contextual factors can have a great deal of influence on the success of these eHealth systems" (Kuziemsky and Lau, 2017, p. 43). An example of D&M success model used in a Danish context was the assessment of Århus EPJ at the Regional Hospital in Randers and Grenaa (Witt et al., 2010)

Medicine Technology Assessment (MTV)**.** The purpose of MTV is to produce a versatile and systematic assessment of the requirements and consequences of using a medical technology

(Kristensen and Sigmund, 2007). However, MTV is not only used on medical technologies. In 2009 MTV was used to assess an IT-system (iHospital) in Region Midt in Denmark and to evaluate if the system was worth implementing elsewhere in the healthcare sector (Jensen et al., 2009). Without going into detail, an MTV analysis is concerned with four guiding elements: the technology, the patient, the organization, and the economy (Kristensen and Sigmund, 2007). A broad MTV is comprehensive and time-consuming as it is based on a systematic and evidence-based research approach with a comprehensive literature study (Høstgaard, 2017).

5.1.2 Proactive

The proactive (also known as formative) assessment is an attempt to overcome the challenges of a reactive health technological assessment (Høstgaard et al., 2013). Mainly three challenges are associated with summative assessment (ibid). (1) The development of HIT extends over a long period of time because the technology is tailored to a specific purpose. This means that before an evaluation is complete, the technology might have changed several times. (2) the traditional reactive assessment is often conducted at a late stage in the life cycle where the technology is often fully developed. Therefore, major changes are expensive and difficult, leading to only minor changes being implemented. (ibid). (3) The complex healthcare sector is not accommodated for, in respect to the difference in work practice (Høstgaard et al., 2017).

To challenge the limitations of the summative evaluation methods, a new research agenda was set in Scandinavia, USA, and the UK. The outcome was the proactive technology evaluation method: **Constructive Technology Assessment** (CTA) (Høstgaard et al., 2013). With CTA the focus was moved away from only addressing the impact of fully developed technologies. Now the focus was also on the technological process itself as a learning and feedback process (ibid). “The aim is to provide feedback on the strengths and weaknesses including the views of different actor groups, during the entire technological development lifecycle” (Høstgaard et al., 2017, p. 2).

Constructive eHealth Evaluation Method (CeHEM). CeHEM takes its outset in CTA and pays attention to end-user involvement and how to support and facilitate it throughout the full-lifecycle evaluation process.

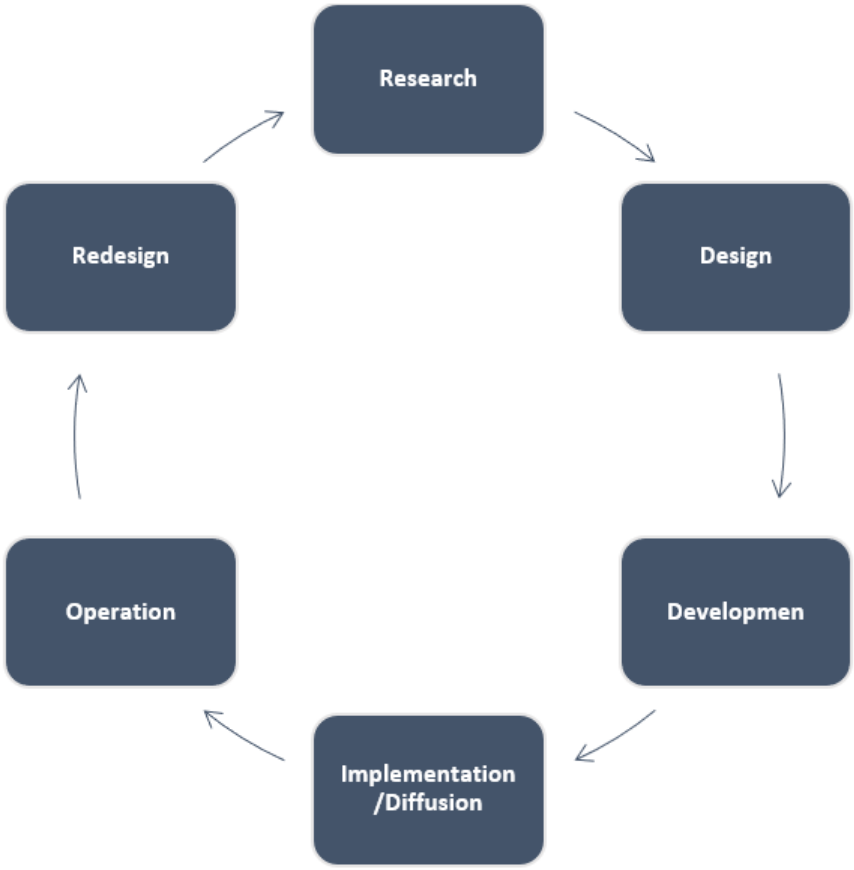

Figure 12: The lifecycle of technology development. CeHEM aims to support all phases

CeHEM is also grounded in a combined theory of Müller et al. (1984) socio-technical theory and the sociotechnical carrier of technology (Edquist and Edqvist, 1979), as described in chapter 2.5.

> *"According to the combined theory, any change taking place during the technological development lifecycle can be traced to changes within the different actor groups or in their respective interests in the technology or capability to carry these interests through. Additionally, technology is viewed as having a mutual and lasting impact on society, which means that changes in technology will eventually result in changes in society, and vice versa" (Høstgaard et al., 2017, p.3)*

End-user involvement is a democratic way of thinking about technological development. "We encounter the deep questions of design when we recognize that in designing tools, we are designing ways of being" (Winograd & Flores, 1989, p. xi). This emphasizes the socio-technical aspect of technology which forms the foundation of the framework. Implementing a new cutting-edge technology or instrument in a medical practice transforms the practice of the doctors. Furthermore,

it also changes the way people think about illness, health, care, and death (Bijker, 2009). When implementing a new EHR system in England the nationwide system showed limited or no benefits. The reason being the lack of user involvement in the development process (Høstgaard et al., 2017). Another example is the recent implementation of the EHR system Sundhedsplatformen by EPIC in Region Sjælland and Hovedstaden. In June 2019, two years after the go-live date, a publication was released, written by a healthcare expert council. The overall theme of the publication was how to improve the system (Region Hovedstaden, 2019).

> *"... there is a need for binding cross-disciplinary collaboration. Sundhedsplatformen has become too much of an engineering project. Organizational implementation in clinical practice, management, and culture transformation is highly underestimated in the implementation of Sundhedsplatformen (Region Hovedstaden, 2019. p.10) (Translated)*

The quotation above is one example of improvements the publication presents. Due to the lack of collaboration, the expert council suggests improving the communication with central stakeholders, and to focus on the cultural changes that the implementation has caused (ibid.).

The approach of the thesis is focused on the end-user and their experience with the technology. As Cura has been operating for six months, at the time of this study, the method in the thesis was in the post-implementation/diffusion stage of the technological life cycle. The challenges of reactive, as highlighted above, includes the difficulty of accommodating the differences in work practice and that no consensus is established of the technology yet, making assessment difficult. The POVA method can be understood as a contribution to a reactive assessment - a way to bridge knowledge between boundaries.

5.2 Bridging Knowledge Between Boundaries

In municipal healthcare, many practices, disciplines, and places exist. Making an EHR able to accommodate and encompass the different work practices is a tricky maneuver. This section will outline how each practice can be understood as its own *community* and how to bridge knowledge between these, which is important in EHR innovation and implementation.

"He is a poor observer who does not notice that a stimulating conversation between two persons soon creates a condition in which each utters thoughts he would not have been able to produce either by himself or in different company" (Fleck, 2008, p.44)

Fleck (2008) describes how concepts are not created spontaneously or individually. People are part of different thought collectives at the same time (political party, class, nation, religion, etc.). Thought processes are much more collective than an individual which also means there is social bias. This means one person alone will find innovation epistemologically unsolvable since problem-solving requires insight from different specialties (Fleck, 2008; Doughtry, 1992). Doughtry (1992) suggested integrating Flecks ideas into an understanding of organizational and process of product innovation. Thought collectives or thought worlds "…is a community of persons engaged in a certain domain of activity who have a shared understanding about that activity" (Doughtry, 1992 p. 182). Carpenters, microbiologists, and organizational departments are all examples of thought worlds. Within healthcare, numerous thought worlds can be observed: pedagogues, nurses, porters, GPs, social workers, technology vendors, administrative, and authority workers, etc. In each thought world there exist some intrinsic harmonies specialized in a specific area. A thought world will excel in certain issues but might ignore certain information important to the task because their area of expertise deems it irrelevant. "Thought worlds with different funds of knowledge cannot easily share ideas, and may view one another's central issues as esoteric, if not meaningless ". (Dougherty 1992, p182). To exemplify this, imagine the game of chess with pieces set in a random position. A grandmaster of the game would not see the same on the board as the beginner. Though the board and pieces are the same, the master sees something completely different from the novice; different problems, threats, opportunities, and ways of achieving them. In this way, each thought world can be seen as a grandmaster of their own game.

Thought worlds resemble a Community of Practice (CoP) as formulated by Wenger (1998). "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." (Wenger-Trayner and Wenger-Trayner, 2015). CoP is a social learning theory. Learning is social and mainly comes from participation and experience in daily life. CoP has similarities with Fleck and the idea of the collective as the catalyst for innovation. A CoP has three main elements: (1) it is a joint enterprise understood and renegotiated by its members continually. (2) There is a mutual engagement that binds the members

together. (3) It produces a shared repertoire of communal resources (e.g. artifacts, routines, and vocabulary). (Wenger-Trayner and Wenger-Trayner, 2015).

Looking at the idea of thought worlds and CoP, as they relate to the complexity of healthcare domains, bridging knowledge between these collectives is an important aspect. The knowledge between boundaries is difficult to manage because of its specialized nature and the level of tacit knowledge embedded in the social practice (Carlile, 2004). Different kinds of boundaries exist. Carlile (2004) describes three different boundaries in innovation: Syntactic, semantic, pragmatic.

- Syntactic level: At this level, the project holds little or no novelty; meaning change is small and incremental, and the process conservative.
- Semantic level: the novelty is higher. Language can be difficult, due to the novelty of the innovation. It can be difficult to understand what to do and with whom. A translation of some kind is needed.
- Pragmatic level: At this level, innovation is changing the way of doing things. An example would be going from paper to digital solutions in healthcare. Boundaries are not just on a communicative scale, but politics and interest play a role.

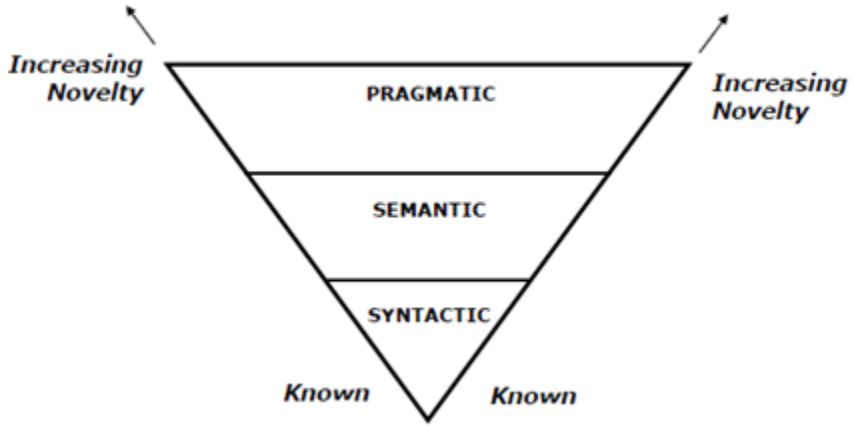

Figure 13: Three types of boundaries in innovation (Carlile, 2004).

How can these boundaries be crossed? Carlile (2004) suggests the idea of boundary objects as an approach, which originates from Star and Griesemer (1989). "Boundary objects are both adaptable to different viewpoints and robust enough to maintain identity across them" (Star and Griesemer 1989 p. 387). The objects act as a shared context that 'sits in the middle'. Star and Griesemer noted the effectiveness of boundary objects when studying different groups and actors at a museum that wanted to expand their specimen collection. The expansion involved different actors each with their

own agenda. The museum inspector's objective was to serve the purpose of evolutionary research, whereas the amateur collectors used it as a profit opportunity. The expansion of the museum's collection therefore varied by the eyes of those who saw it. The boundary objects, such as field notes and specimens, were able to bridge knowledge and anchor visions between heterogeneous groups of different disciplines (Star and Griesemer, 1989). The same understanding can be used with EHR systems in a municipality context. A social worker, administrative worker, or technology vendors have different views of the system.

An essential characteristic of boundary objects is the standardization of methods (Bossen et al., 2014). In the research by Star and Griesemer, it was not without challenges using the data by the amateurs, in the shared goal of nature preservation and expanding the museum's collection.

> *"In working with amateur collectors, a major problem is to ensure that the data coming back in from the field is of reliable quality; that it does not decay en route through sloppy collecting or preserving techniques that the collectors give enough information about where they got the beasts from so that the locations can be precisely identified. On the other hand, directions for collectors cannot be made so complicated that they interfere with the already difficult job of camping out in the wilderness, capturing sneaky little animals or bribing reluctant farmers to preserve intact their saleable" (Star and Griesemer, 1989, p. 407)*

Despite the actors' different agendas, the standardization of methods allowed collaboration between the different disciplines. The purpose of Cura, and FSIII, is to directly set itself as this boundary object between disciplines and facilities. In the example with the amateur collectors the directions given to them, can neither be too complicated nor too loosely defined. The same is true for the methodological framework of FSIII in Cura. As presented in the following analysis chapter, the observational option was experienced as too out of sync with the social workers' work practice. Making proper standardizations is an iterative process. In the case of Cura, small iterations were made to the technology to align the observational options with the users' work practice better. Furthermore, posters with glossaries were handed out in order to assist the front staff when documenting and thereby help FSIII and Cura in the direction of being a boundary object.

Not everything can be a boundary object and some boundary objects might become roadblocks in another context (Carlile 2002; Bossen et al., 2014). Carlile (2002) identifies characteristics of an

effective boundary object in each level of knowledge boundaries. At the syntactic level, an effective boundary object "...establishes a shared syntax or language for individuals to represent their knowledge." (Carlile, 2002, p.451) At the semantic level an effective boundary object "provides a concrete means for individuals to specify and learn about their differences and dependencies across a given boundary." (p. 452). "At a pragmatic boundary an effective boundary object facilitates a process where individuals can jointly transform their knowledge." (p. 452).

Looking at boundary objects as a facilitating tool in EHR is therefore highly relevant as a problem-solving method of cross boundaries between heterogeneous and highly specialized groups. The implementation of Cura Social can be said to fit somewhere between the semantic and pragmatic level as many challenges are related to the communicative scale, and some to the pragmatic in relation to FSIII. In this thesis, we will research the socio-technical challenges that Cura is facing, and how it can become a boundary object.

6. Analysis

This chapter will analyze the socio-technical ramifications of Cura Social. It is important to note that the system is based on the FSIII methodological framework (see chapter 2.6). An EHR-team project manager explains:

> *"If I have to say a third thing about the difficulties then it was the introduction of FSIII - a new method - concurrently with the new system. Some naively believed that because Cura was built up around FSIII it would then become a natural part of it and the implementation of the new method would just come naturally. This was not the case. There were many new work routines and new ways of working which have been implemented because of FSIII and not Cura. "(Appendix C, EHR-team project manager A, p.8, §47)*

None of the POVA participants made a distinction between the implementation of Cura and FSIII, which means that they describe Cura as structuring the data in a certain way. Cura can, therefore, be seen as an implementation of both a new system and a method.

Based on the interviews, workshops, and observations conducted in this thesis, the general opinions and experiences with the use of Cura has been mostly negative. It should be noted that the majority of the data was collected when the cognitive workload of the new system and method was at its highest. Changing work practice and routines due to the implementation of a new EHR system takes time and demands patience as described in chapter 3.2.3. This thesis reflects the social workers' experiences with and off the system in the time period from two months prior to the go-live date, until six months after. Despite the, at times, negative opinions, several informants expressed a positive outlook. The focus area of this analysis is not directly passing verdict on whether Cura is a successful or failed EHR-system but understanding the socio-technical ramifications of such an implementation. By doing so we can gain valuable knowledge for future similar implementation projects.

6.1 Social Psychiatry as a Complex and Unique Workplace

According to the Danish Service legislation, it is the responsibility of the municipality to offer support and social care to citizens with mental or physical impairments and help them with social and physical progress (Danske Love, n.d.). Although residential accommodations' (RA) and day centers' (DC) work practice is based on the same laws, each specific work facility and associated residents are unique. Due to the uniqueness of each individual resident, the front staff must approach and work with each citizen differently. An example of this is: "... practice cooking a meal or doing laundry, but it could also be practicing saying 'no' to some people who are not good for you" (Appendix D, Department Manager A, p 15. §31). The care and support changes from person to person "... so you have to figure out what it is that this person needs in order to have a good life" (Appendix, E, Department manager B, p.26, §22). Focusing on a citizen with physical obstacles, down syndrome, psychical illnesses, etc. differentiates the social care to give. The physical surroundings, work culture, routines, and the high diversity of residents makes each work practice unique.

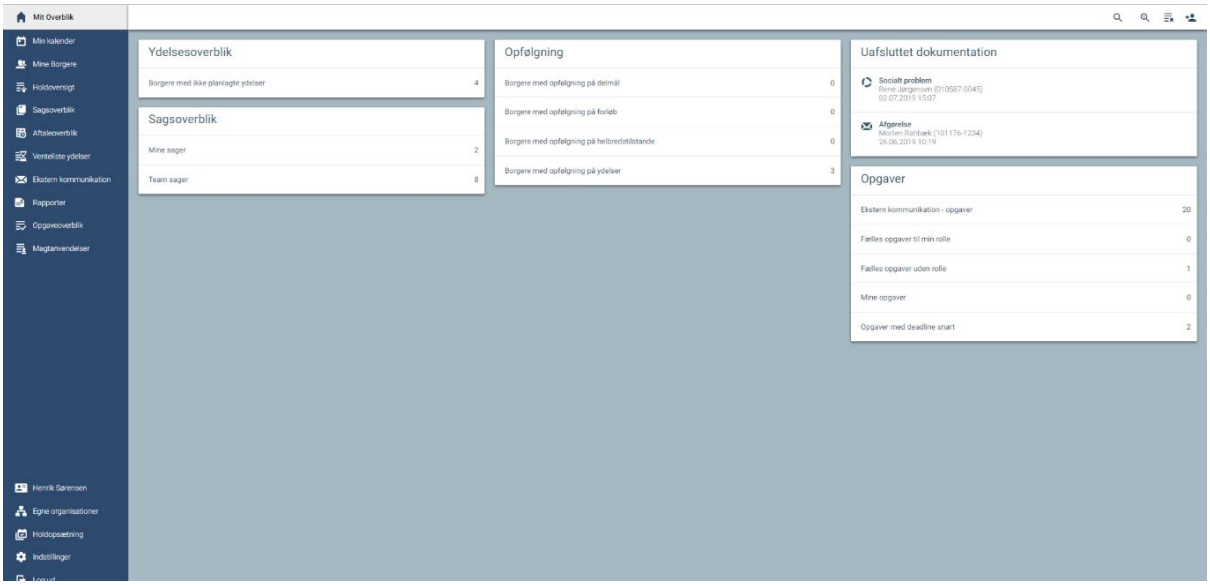

Figure 14: The start page of Cura Social after login

6.1.1 Calendar and Navigation

"... it is also a big shortcoming that the calendar does not function yet. I told them [EHR-team] about the importance of a calendar on the first meeting, because if you have 18 residents on two floors then it is difficult to coordinate who does what, when, and who has ordered a taxi? Now I have to write at each nine residents' page

[inside Cura] that a taxi has been ordered for all just to be sure. "(Appendix F, Department manager B, p.36, § 52)

In the quotation above a manager of a RA describes how a calendar is an important work tool and part of their work practice, which she had told the EHR-team before the implementation. The EHR-team is an administrative project team with the assigned task of help, support, and manage the implementation of Cura in the social psychiatry in Hjørring Municipality. Photo 1, from the photography task, taken by a social worker at the same RA, shows that physical calendars are still in use two months after the interview with the manager.

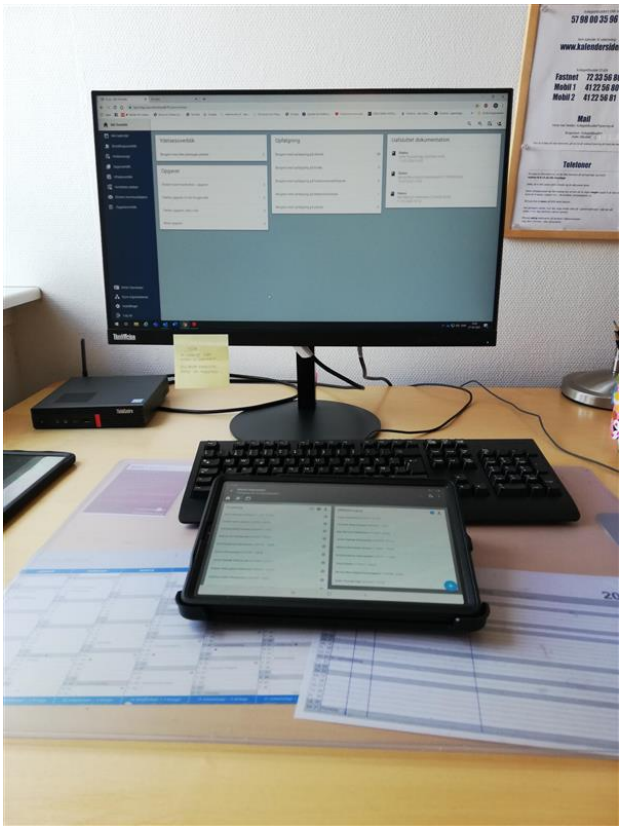

Photo 1: A photograph taken by a social worker at a RA showing the documentation platforms (desktop computer and tablet) and the physical calendars (under the tablet).

In the current configuration of Cura implemented in the social psychiatry, the online calendar feature does not synchronize with staff' and the residents' individual calendars. If the staff were to use the online calendar, they must duplicate and copy each appointment into both the staffs' and each residents' calendar. As a manager of a RA said, it is a very time-consuming task if an employee must use the affiliated minibus, they have to write it into every staff and residents' calendar.

Therefore, does the staff use a physical calendar to schedule their workday. The physical calendar thereby better fits the work practice needs because the digital calendar in Cura is experienced as simply too time-consuming.

Furthermore, it is argued that the navigation in Cura is difficult and time-consuming (clicks involved when navigation between residents). Two problems arise here; accessing the documentations and navigating to the correct place to write an observation in Cura. The latter will be elaborated in chapter 6.2. Accessing the documentation in Cura has been expressed as a problem in every interview and observation made with front staff at RA after the implementation.

> *This means that you must click on each individual citizen, click on "show more", and go one month back. This is a lot of clicks before you can read what you must read every day on each individual citizen. (Appendix F, Employee D, p. 29 §60)*

> *We have 12 citizens. We must navigate to each one every single time to read what has happened - we use a lot of time. [...] Now you must navigate "out" of one citizen page, and "in" to a new citizen - "out" of that citizen and "in" to a new citizen. I feel like I use an extreme amount of time on this. (Appendix M, Employee E, p. 74 §61)*

> *No, there is no "overview" when we log on. You can select "latest" observations, the last 14 days [...] but there can be three observations in one day and if I have to look ten days back then there will be 30 [observations]. We cannot create an overview; we have to open every single one to look for important information or trivial things. In EKJ you click - then you would see "Birgitte has been self-harming" - that could be the headline, that is very important you notice that. We do not have this option [in Cura] because we do not have the time to sit around and open 30 [observations]. A lot of information is lost. (Appendix O, Employee B, p. 83 §44)*

As the quotations describe, accessing these observations requires many *clicks* in Cura. Reading previous observational entries is an important part of the job, since the social workers often have consecutive days off, whereas the entries provide the necessary and up-to-date knowledge about each resident. This knowledge is needed in order to facilitate the best possible social care for each resident.

In the old system (EKJ) the staff could simply scroll down and read the entries for each resident with few clicks involved. In Cura this task now requires manually clicking "in" and "out" between each resident profile. Ultimately this could lead to skipping or missing important information in facilitating the best possible support for each citizen.

6.1.2 The Powers of the Unstructured Diary and Workarounds

The Diary

Throughout this entire study, every single informant before and after the implementation expressed how important the *diary* feature in EKJ was for their job. When working at a RA supporting the residents is the primary focus area, however, the underlying work practice and coordination between staff members are just as important. "… things still happen in this house that is not directly involved with the citizens, we have to have that written down somewhere" (Appendix F, Employee D, p.30 §51) The structure of Cura has affected the important and non-structural communication between staff members at the accommodation. Despite not being centered around the resident, it is important that the colleagues at a RA can communicate between shifts to pass on daily observations that do not fit into the available observational options in Cura.

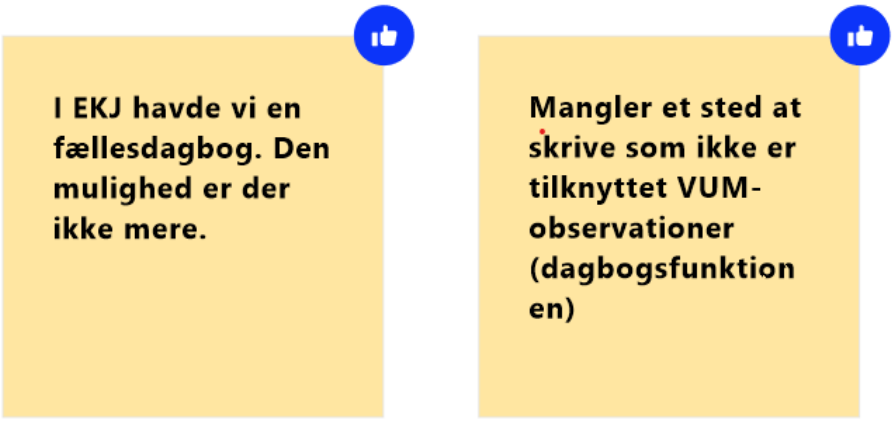

Photo 2: Two examples of how the informants have chosen the diary functions as one of the most important issues with the current configuration of Cura. From left to right: "In EKJ we had a shared diary. We do not have that feature any more"; We need a place to write down things that does not relate to VUM observations (the diary feature)"

Even though the staff aims to create structure and recognizability for the residents, the work practice of the front staff itself is highly fluid; adapting and improvising constantly to facilitate this goal. Unforeseen situations do not fit the formal structure of Cura. The system is not suited for the unstructured

and unforeseen situations that can occur at a RA; "... I used one and a half hours to motivate a citizen to eat with a knife and a fork, I have to write that down somewhere even though it is not a direct focus area (indsatsmål) "(Appendix F, Employee D, p.30, §59). Simple *everyday stuff*, such as doing laundry can be a strong presence in a resident's life. An informant from a RA here described how they previously used these every day observations as a *conversation starter*. This was an efficient way of communicating, with especially speech-impaired residents. The diary illustrates well how technology cannot be analyzed in a vacuum. The feature complements the division of labor and knowledge amongst the staff members to facilitate the best end product.

Workarounds

Novak et al. (2013) describe the adaptation process of technology implementation in healthcare, as: "adaptations are dynamic responses by human actors to the technology as well as the evolution and persistence of these responses over time" (p. 332). Novak describes two frames of reference in relation to clinical work practice: Practice Frame and System Frame. The Practice Frame describes the understanding of a work practice from the perspective of the practitioner, whereas the System Frame is the perspective on the work practice from technology vendors, developers, and decision-makers (ibid.).

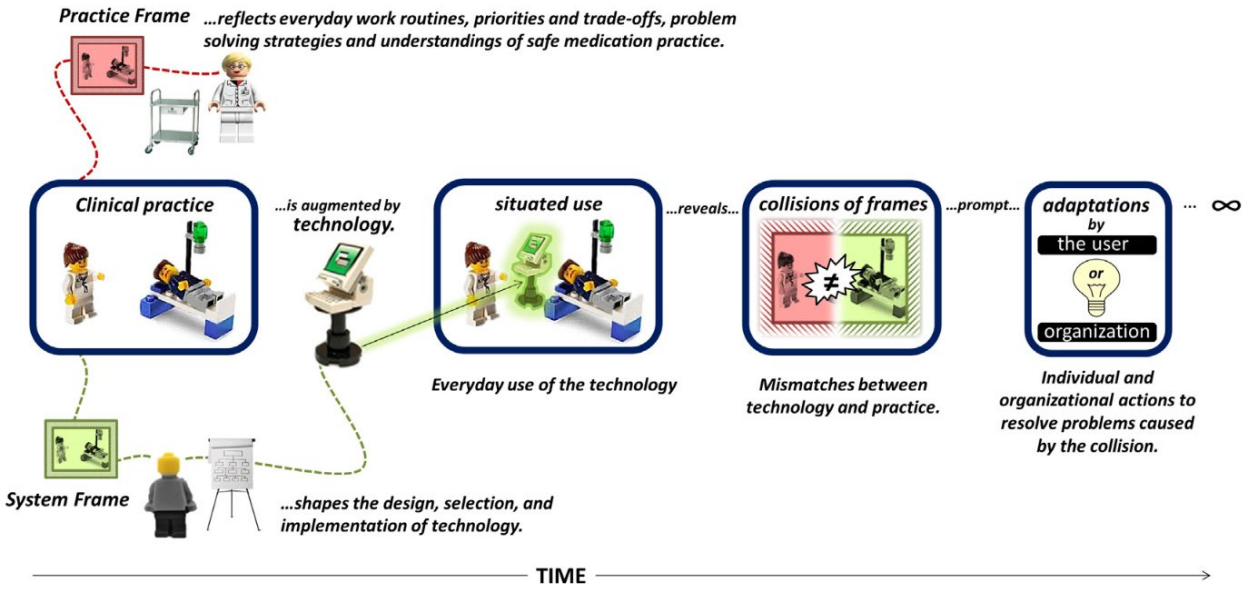

Figure 15: A visualization of the different frames by Novak et al. (2013)

Collisions between these frames can occur. The optimal outcome of such collisions is mutual learning and increased adaptations. "In a less optimal scenario, there is a collision in priorities or understandings of practice that goes unresolved, leaving end-users, groups, and organizations to

adapt to fulfill individual goals" (Novak et al., 2013 p.332). In the context of the design, configuration, and implementation of Cura there has been a clear distance between the Practice Frame and the System Frame, which have resulted in the front staff doing workarounds; new ways of working due to the experienced shortcomings of the system, such as using physical calendars. The following table 5 presents the workarounds discovered in this study.

1	**Physical calendars** *Workaround of the calendar function in Cura*	4	**Physical paper with resident information** *Workaround of the problems with navigating in Cura – gives an overview of who the residents' contact persons (Gets destroyed each day)*
2	**Email** *Workaround of the missing diary function in Cura*	5	**Post-it notes on the computer screen** *Workaround of the problems with navigating in Cura – the post-it notes are used to remind colleagues to read specific observations in Cura*
3	**Physical staff meeting records (locked into a safe)** *Workaround of the missing possibility to store staff meeting records in Cura*	6	**Microsoft Teams** *Workaround of the missing diary function in Cura*

Table 5: This table shows the workarounds and incorporation of other technologies which the informants have presented throughout the data collection, as a response to the missing features in Cura

> *"I think it is "bulky" [Cura], but I believe it is because there are many missing features still and because now, we create a lot of bad habits and that is really annoying." (Appendix F, Employee D, p.29, §54)*

The workarounds in table 5 are examples of situations where the frames have collided. The workarounds are prompted by the collision. There are factors at the micro-level that are important by the Practice Frame but not encompassed by the new EHR system. One example is a social worker describing how she washed a resident's specialized duvet, so no one has to do it next week. The diary functionally allowed an unstructured way to document and pass on such mundane, yet important things regarding the specialized needs of each resident.

6.2 Transparent System

Cura is in many ways different from the old EKJ system. In this section, we will look at how the key features of the system fit in with the unique work practice as described above. The main feature of the system is the transition to a transparent system enabled by FSIII. This section will explore the implication for the work practice, how Cura is used as a boundary object between the facilities, and how this can be understood by applying the four elements that constitute technology as described by Müller et al. (1984).

From Standalone to Transparency

The former KMD system EKJ was a standalone system. This should be understood as each accommodation's documentation remains at each facility; no direct data exchange. In the social psychiatry sector, it is normal practice for citizens to be affiliated with multiple facilities. Normally this would be a RA and a DC.

It is a cornerstone in social psychiatry work to provide structure for the citizens; being able to give each citizen fixed boundaries in their everyday life. Providing fixed boundaries demands a need for remembering. Remembering each citizen's individual routines, needs, schedules, *dos and don'ts* is a major part of the job. Planning and preparing is therefore a major element in the work practice. Paper, calendars, post-its, whiteboards, and dedicated IT-planning systems were present when visiting different accommodations. Photo 3 shows a RA's way of structuring daily tasks with a paper-based system before implementing an IT-planning system.

Photo 3: This photo visualizes the former planning system of a RA. This paper-based system was placed in the staff break room and showed the necessary work routine information. The system was later replaced with a dedicated IT-planning system complete with a big touch screen monitor and smartphone/tablet application

In two traditional co-present interviews, conducted February 2020, we tasked the social worker and RA manager to illustrate all the different actors a resident at a RA has contact with.

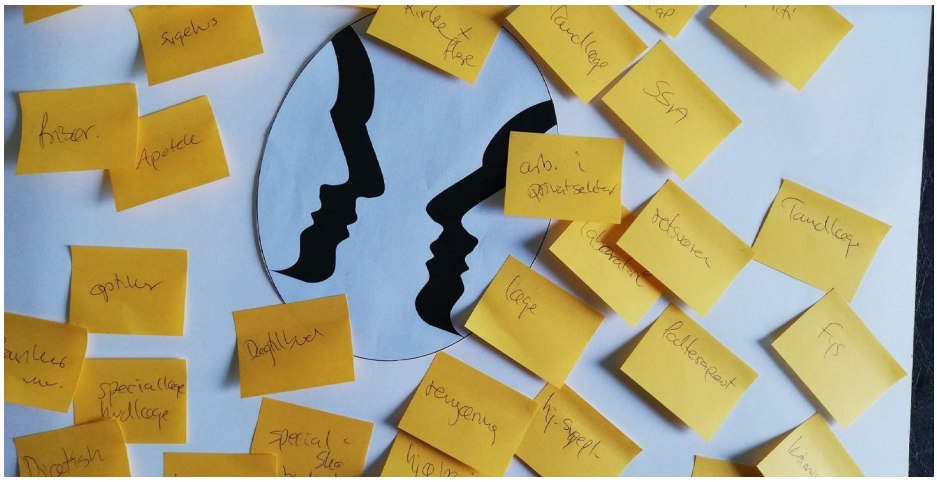

Photo 4: A photo of a map made by a manager and social worker at a RA showing the different actors a resident is in contact with. "Massage, Emergency service doctor, Hospital, Hairdresser, Pharmacy, Optician, Specialist doctor, Dermatologist, Dietitian, Outpatient lung department, Surgical appliance maker, Day center, Psychiatrist, Church, Municipal authorities, Police, Dentist, SSA, Workplace, Legal system, Laboratory, Physiotherapist, Chiropodist, Prison Service, Family/friends, District nurse, Cleaning service, Assistive technology department"

The photo shows the many different actors in the lives of the citizens and why proper coordination is important. Besides proper coordination, other factors influence the resident's well-being such as general mood, contact with relatives, specific encounters with other citizens and staff members.

As citizens often are affiliated with a DC, in addition to the RA, coordinating information between the staff of these facilities is important. An example could be a resident having a bad experience during the weekend or a difficult morning which affects his/her mood. This information is important to pass on to the DC. With this information, the staff at the DC can facilitate an all-around better day. Between the DC and RA, such information was often passed on via telephone prior to the new system. Cura allows for better exchange and transparency in the information, meaning the DC can read the documented observations of the affiliated citizens from the RA and vice versa. The transparent system is experienced by the font-staff as a clear improvement.

Exchanging Knowledge

With FSIII more recycling and use of data is the aim throughout the Health, Elder, and Handicap area, as well as the municipal authority (myndighed). Cura, in conjunction with FSIII, is placed as a medium

of this exchange. It becomes the mediator and carrier of information necessary for different facilities and professions.

In the social psychiatry different facilities and professions can be characterized as different Communities of Practice (CoP) with each their own expertise related to the citizen such as pedagogical, rehabilitation, psychiatric, somatic, and medication. The communities each have their own stance and perspectives and may only be familiar with the perspectives of other CoP to the extent that is required for cooperation to happen.

This is where Cura can be analyzed as a boundary object as it becomes the medium of knowledge exchange between CoPs. The intention is that the usage of Cura should facilitate coordination and communication across practices by being "… both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (Star and Griesemer, 1989. p. 393).

Bossen et al.' (2014) study of medical secretaries in two hospital departments also recognizes the EHR system as a coordination mechanic acting as a boundary object "...that facilitate and stabilize cooperation between different social worlds, whose actors relate differently to, but cooperate through these" (Bossen et al., 2014. p. 79). Coordination between the different areas is emphasized in the new system.

It is important to check up on each citizen every day to make sure all changes are accounted for. These changes could be a doctor issuing new medication or a new dentist appointment. Another example is the transparency between the social worker, authorities, and facilities. Cura allows the administrative social worker (sagsbehandler) to read what is being documented at the facilities. Furthermore, the DC is now able to read the VUM-report made by the administrative social worker. This affects the communication and coordination between these worlds.

> *"The municipal authorities can read along what we write and that is actually good [...] because if there is some sort of problem we [the social workers] can write to them [municipal authorities] 'can you check what Cura says this and that day - we think there is a problem' in that way communication have become easier and faster" (Appendix G, Employee D, p.42, §.29).*

To allow such transparency in data and data exchange requires semantic and pragmatic alignment. Semantic in the way of understanding the new structured language of FSIII and pragmatic in the way of documenting. Winman and Rystedt (2011) propose how the required knowledge on *how* to codify information is just as important as the shared conceptual framework itself. In an ethnographic study, they examine the practical work of organizing, selecting, and structuring information in an EHR system in Sweden. Sharing information over institutional boundaries can be difficult because "knowing *how* is thus a prerequisite for knowing *that.*" (Winman and Rystedt, 2011 p. 59), meaning that different concepts have different meanings for each community. One facility may classify an event as important while another facility experiences the same event as not important. Division of labor leads to a division of knowledge which can create distinct epistemic cultures. Duguid (2005) claims in his paper on tacit knowledge and the limits of CoP, how efforts of sharing information between community boundaries require a degree of knowledge about how such information should be understood. "But when the practices of knowing *how* of two communities are different, epistemic barriers develop and productive sharing of knowing *that* becomes much more challenging" (Duguid, 2005 p. 114).

The use of Cura has had a major impact on the documentation practice. However, if the system is to succeed in creating coherence and bring value to the data exchange, knowing *how* is crucial. A social worker expresses in the following quotation, how the lack of answers from the EHR-team causes uncertainties about the use of the new system:

> *"I also think the disadvantage is that now we all make our own bad habits, because we properly work a bit differently, and then we have to change these habits when Cura functions properly. The point was that the whole municipality had to work uniformly, but we cannot do that when we never get an answer. Then people start doing workarounds". (Appendix F, Employee D, p.38, §50)*

Habits can become routines and if the epistemic boundaries between the facilities are not considered it will cause challenges if the end goal is uniform and comprehensible data. Therefore, Cura cannot, by itself, act as a boundary object. Cura requires that the users have the necessary knowledge of how to use it before it can act as a bridge between the CoP's. Failing to recognize this can lead to misinterpretations and miscommunication. If this happens Cura will not be a boundary object but rather the opposite, acting as a technology causing misinterpretation rather than cooperation. A superuser from a DC highlights the challenge:

"... I understood it in one way, my manager understood it in another way, and the person who wrote it understood it in a third way - how can we make sure everyone has the same understanding of what is written? This is a big thing at the moment." (Appendix H, Employee A, p.45, §3)

New Ways of Documenting

The semantic and pragmatic challenges have been major themes in the implementation of Cura. The staff cannot write long free text anymore, as observations are now structured in fixed classifications. This structure is needed to enable the transparent capabilities of the system to function but hinders free-text documentation. This is a trade-off, and which can cause difficulties. A social worker might be observing multiple different issues related to one area of interest, making the choice of classification difficult. Structuring this data can be a challenging task working with disabled adults as many observations are vastly different. New unique observations and problems arise daily. The social workers experience the system as distant from their pedagogical work practice.

"The system is not very user-friendly on the pedagogical front. It is fine in the health area, but it is not user-friendly for the stuff we are ordered for. [...] we miss some pedagogical observational options and headlines [...] that is a little bit annoying still." (Appendix I, Employee C, p.52, §55)

Her experience is not unique and exemplifies the paradox of standardization in the sector; coherence demands structure, which eliminates the free expression form of documenting. At the EHR-team this problem was noted. They have now integrated possible observation categories based on VUM-themes in order to better fit the observational options to the pedagogical expertise. Furthermore, have the EHR-team handed out posters to the social workers about to help the navigation in Cura (photo 5). A project manager from the EHR-team explains:

"Our [EHR-team] wish is that they [the social workers] can see themselves in the observational options so that it becomes a pedagogical world they document in." (Appendix C, EHR-team project manager A, p.10, §30)

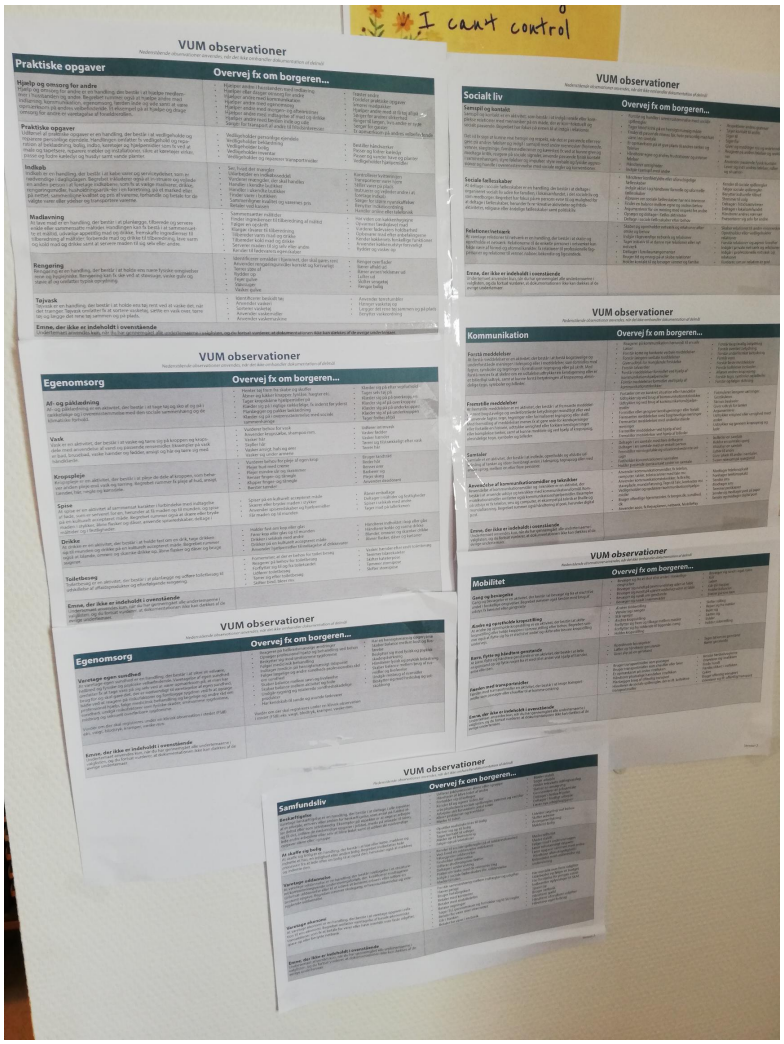

Photo 5: Posters at the staff lounge which purpose is to assist the staff when documenting; what kind of observations fit into the different observational options in the system.

With the integration of Cura, a trade-off is happening between the structural language of FSIII, and the free text options, which the informants describe as important for their work practice. Sharing information requires structured data. Keeping the free-text options would complicate sharing information between facilities.

It should be noted that, despite the obstacles described, the transparent system is already being perceived as an improvement. Especially by the workers in the DC's who now have access to information that prepares them better when receiving the citizens. In our workshop with a superuser

from a DC, the benefit of the transparent system was a major theme. In the photography exercise[1] in the POVA workshop all issues related to the new transparent system.

1. A fast overview of citizens before we receive them
2. Easy contact with administrative social workers
3. More information about the citizens to support them in the best possible way. We know what happens at home (at the RA)
4. You have always the most important information of each citizen at hand (personal data), instead of searching around for them or it being locked away in a folder or a locker.
5. Sometimes forget the physical contact (phone call) to the RA because we can retrieve the necessary information ourselves.

The last issue is interesting as she reflects upon the consequences of not needing to phone the RA as often. She explains that the dialogue between the places must never be lost. She could never imagine Cura replacing the oral knowledge exchange between the staff at the different facilities.

> *You sometimes get a different dialogue when you talk together contrary to writing… and understanding especially. (Appendix H, Employee A, p.45, §62)*

The municipal authority and the DC's are the actors who receive the most value through the data exchange according to the informants. This is because the RA's are perceived as making the most data entries. However, an overall positive attitude towards the transparent system was expressed not only at the DC but also at the RA. The transparent system was experienced as making sense for all actors.

The transparent system exemplifies how Cura can be understood as a socio-technical challenge and the dialectic relationships within technology. Cura requires new knowledge of the staff for it to function properly as a boundary object between the different facilities. This in turn has required adjusting the system to encompass the work practice of the social worker better by adding observational options based on VUM-themes and creating assistive tools to understand Cura. The transparent system has also changed the division of labor and the work practice most notably when coordinating between DC's, RA's, and administrative social workers. The product is also affected by the relationship. One example is the DC's' greater opportunity to prepare for each individual citizen as they greet them every morning.

[1] The participant was not able to take any photos of her work practice at the DC because it was temporarily shut down due to the COVID19. Instead we tasked her with making a list of five items.

Cura is already being adjusted to fit their work practice better based on the feedback from the staff. With reactive assessments, major changes to the technology are often all too expensive (Nøhr, 2017). Therefore, solutions to the challenges resemble stitch-ups rather than changes to the core system.

6.3 Expectation and Reality

> *When they [EHR-team] had to advocate for Cura [to the superusers on the first couple training sessions], they REALLY made a good case. I truly believed this [Cura] would be great. However, I wrote to everyone in there [the EHR-team] that I could not advocate for the system because I do not think it is good at all. It is really hard for me, as a superuser, to "sell" the system - I cannot do that. That is the reason I had to quit as a superuser. (Appendix M, Employee E, p.73, §48).*

Even though some features, like the transparent structure, resonate well with the work practice, this does not mean that the implementation was an overall success. In the quotation above a superuser speaks her mind regarding the system and her decision to quit as a superuser. Her reason is that the system does not live up to the expectation that was promised her.

Implementation is a misleading word. It is most often associated with the chaotic phase just when the technology is first used. However, this phase is just a small fraction of the whole implementation process. Firstly, policies and interests are playing a role. The social carrier of technology is the decision-makers and project managers at the municipality. They have chosen and implemented the technology. The municipality has a clear interest in choosing Columna Cura as the system lived up to the expectation of integrating FSIII among other things. The municipalities are professionally organized to make the decision of choosing the system as well as possessing the necessary economic, social, and political power. Information, access, and knowledge of the technology have all been acquired through public procurement. The municipality as an actor is the actual carrier of technology. It is not within the scope of this thesis to demonstrate the alliances and power struggles in a sociological sense behind the choice of Cura Social, but rather explore how the carrier of the technology fashioned a conception of the technology prior to implementation, and how this conception did not meet reality.

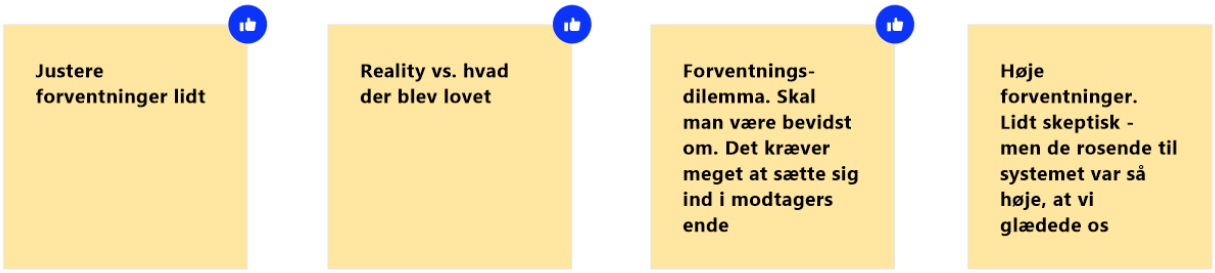

Photo 6: Screenshots of four different post-its from four different workshops. Each showing the expectation towards the system. From left to right: "Adjust expectations somewhat"; "Reality vs. what was promised"; "Expectation dilemma - one must be knowledgeable about it - it requires that one must understand the receiver"; "High expectation, somewhat skeptical, but the praise was so high that we got excited" (Appendix L)

The impression and expectation of the new system have been built up over a long time. At Hjørring municipality this mainly happened through the network meetings (netværksmøder) held regularly at a conference room at the local library. At these meetings, the superusers, FMK-responsible, and managers at each facility were present. Learning packages, slideshows, and material, in general, was sent out after the meeting. The job of the superuser and manager was to facilitate this learning on to the rest of their respective facilities. At Hjørring municipality, a tablet with a simulated environment of the system was distributed late in the pre-implementation phase (around two weeks prior). Prior to the go-live date, three interviews with managers and staff members at RA's and DC's were conducted. The expectations were high all around.

The expectations of the functional affordance highlighted were:

- The ability to document on a tablet
- Easier documentation process
- Streamlined and less documentation
- Transparent system
- Usability

In research on how HIT influences routines in healthcare delivery, Goh et al. (2011) illustrate ways in which HIT interacts via functional affordance and symbolic expressions. Symbolic expressions should be understood as the intangible messages the system communicates to its users. In the case of Cura Social, the system communicated: easier documentation, effective coordination, and improved quality. These expressions were formed even before the users had interacted with the system. Mainly through the educational material, network meetings, and marketing material were these symbolic expressions formed.

Photo 7: "Cura - a good colleague starts on Monday" Screenshot from Aalborg municipality webpage (Aalborg Kommune, 2019) - framing Cura as "a good colleague" was a recurring theme in marketing material, leaflets and video material by Systematic and in this case also by Aalborg Municipality.

The go-live phase was characterized by quite the opposite symbolic expressions. As we visited a RA 24 days after go-live the attitude had shifted greatly, as expressed in the field note entry.

> *"My (the author) initial thoughts, before we came here, was that it actually would work really well, with only minor problems. However, after today, it seems like it has created a lot of frustrations. The first 10 minutes was a rapid-fire of irritations of what the system could not do or should be doing. "(Fieldnote entry, 21/11 2019, Appendix K)*

One of the features highly expected was the ability to document on a tablet which allows for documenting together with the citizen (medborger dokumentation). Instead of the documentation practice being allocated to the staff lounge (which is off-limit for the residents) the tablet allowed for documentation with the citizens in their own apartment or common area. No RA or DC at the time of the thesis, has used this feature. The feature acts as a good example of the clash between expected condition vs. actual condition.

Goh et al. (2011) point towards two key factors as the drivers of the reframed symbol expressions: *Loss of performance* and *missing features*. These features were also present in this research. The users experienced a significant increase in workload, mainly related to documenting and navigating within the system. Missing features include: the diary option, calendar, and pedagogic terminology. In the go-live phase agency is characterized by workarounds, leaning, and reframing the symbolic expressions.

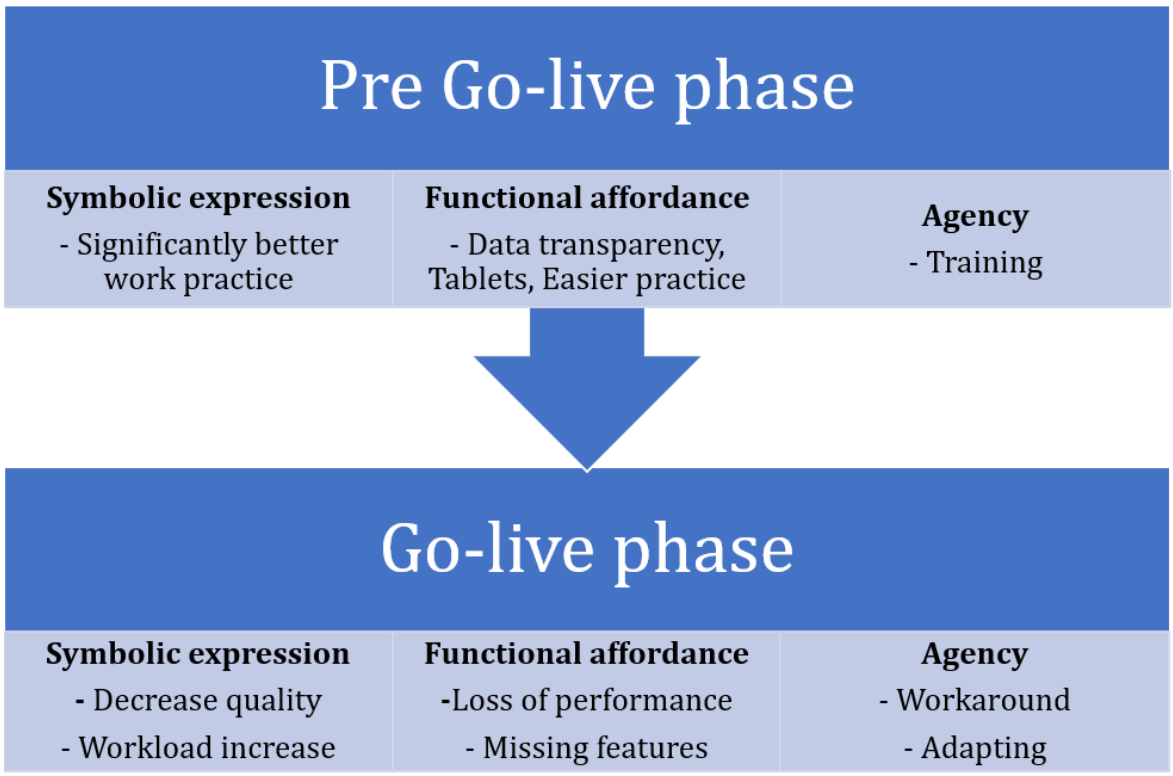

Figure 16: Inspired by Goh et al. (2011). Visualizing the symbolic and functional affordance evolution from pre-implementation to go-live

The last phase (after pre-implementation and go-live), as Goh et al. (2011) describe is the refinement stage where the user begins to explore new capabilities and fine-tune routines; a syntheses of the technology and work routines, where the symbolic expression changes to 'performance improvement'. At the time of this report (6 months after go-live) we argue that this phase has not yet set in (and therefore not present in figure 16). In the POVA workshop, when asked about their view on the future, a positive outlook was present.

When implementing a new system that demands new work routines, such as Cura, the cognitive workload will often increase significantly. Mundane tasks in the former EKJ system now require a significant cognitive workload. Colligan et al. (2015) describe how nurses, after the implementation of an EHR system also experienced significant increased cognitive workload due to their routine practices being disrupted. As time passes and workflow is being redesigned and new routines reemerge, it is not unlikely that the system will be associated with performance improvement, less cognitive workload, and a better end product. Further research on Cura should investigate this phase of implementation.

Informant	Before	Go-live	Now
Social worker (superuser) at RA	1	3	1
Social worker at RA	1	2	2
Superuser at DC	1	3	1
Nurse (superuser) at RA	4	1	0
Total	**7**	**9**	**4**

Table 6. This table shows the tokens distributed by each participant. The participant was asked to distribute five tokens in relation to how difficult they experienced each phase.

Table 6 shows the distribution of tokens of each participant related to how hard the informant experienced each phase. It is clear that the go-live phase was the most difficult part. Except for the nurse, a clear theme is visual: an easy pre-phase, harder go-live, and less difficult "now" phase. This supports current implementation literature (Rogers, 2003; Goh et al., 2011; Hertzum and Ellingsen, 2019). Implementation takes time before a consensus and routines have been properly developed around the technology or the technology has changed to meet the demands.

The framing of Cura, leading up to go-live, was experienced as misleading by the staff. The system was experienced as not finished, it did not have the promised features, and navigation was time-consuming. The system has already, in its relatively short life, undergone changes and updates. In Hjørring municipality public procurement is required seven years after the go-live date. The municipality can extend the contract a maximum of three years. If FSIII is updated to FS4 the public procurement can happen earlier than seven years. EHR systems are always in flux but the socio-pedagogical work practice remains the same.

The technologies change constantly, therefore it is important to mention the technologies as such rather than the final utopia of EHR. The product: the best possible care of the citizen, should always remain the primary goal rather than an effective EHR. These two are not always two of the same coin.

6.4 Concluding Remarks

This chapter has analyzed the uniqueness of the work practices at RA and DC in the social psychiatry; each facility has different needs and wants. The technology developers and the administrative workers' understanding of the work practice of the social workers are different from the social workers' own framing. Therefore, a collision of frames occurred where the technology has been implemented which prompted different adaptations by the social workers. Workarounds are being implemented to overcome the experienced barriers of the technology. The distance between the frames have resulted in different *stitch-up* solutions being made: new observational options and posters to help the staff with the documentation. By incorporating the users more proactively in the assessment there would have been more opportunities for mutual learning and thereby minimize the impact of frames.

An often missed feature by the front staff is the diary option. This allows free-expression, informal structure, and compliments the *fluid* work practice of social workers well; meaning that they are always adapting to unique situations and undertakes many different roles in the complex care of the citizens. Different situations can be interpreted differently by different social workers and communities. What is seen as important in one facility might not be for others. Cura acting as a medium for data transparency between the different facilities is not enough in itself to act as a boundary object between the CoPs. Effort must be put into *how,* before valuable data output can be established.

With the implementation of Cura, the cognitive workload is naturally increased. The informants expressed frustrations towards the system in relation to time, usability, and missing features. The major advantages of the transparency in data are viewed positively. Other positive features include the new structure of the resident status (statusrapport), where the social workers must follow upon and update the focus areas (indsatsmål). Furthermore, a generally positive outlook in the future with Cura was expressed. The fact that the implementation process takes time supports the current implementation literature (Rogers, 2003; Goh et al., 2011; Hertzum and Ellingsen, 2019). An important takeaway is that the distance between the expectations and reality of the system were too big. All informants expressed dissatisfaction regarding this matter, with one social worker even quitting her superuser role. The problem is a communicative challenge with the technology vendors and EHR-team assigning the technology with inexpedient symbolic expression. It is a trade-off, as the EHR-team naturally wants to excite/motivate the front staff and state the reason for the replacement

of the EHR system. If the symbolic expression is not positive, the users might express confusion as to why they even need this replacement. We argue that involving more users earlier in the assessment would mitigate unrealistic expectations. Furthermore, a much earlier distribution of the tablet with the simulated Cura environment would also have promise for a better match of expectations. We argue that the tablet with the simulated environment should be distributed, preferably months in advance, to every facility. This would allow the users to "play" with the system in a risk-free environment while also talking and creating a dialogue with their colleague about the system before go-live.

7. Discussion

This chapter is divided into three sections: discussion of results and discussion of methodology. The last section will suggest and reflect upon other application fields for this methodology.

7.1 Discussion of Results

This section will revolve around the results of the analysis chapter. The analysis chapter has presented the following main takeaways:

- Day centers and residential accommodations have different needs and wants
- There is a need for a quick and proper way to get up to date on each resident
- The unstructured nature of the diary complements the work practice well
- The transparent structure of the system is experienced positively
- Collisions between uneven frames prompt context-specific workarounds
- Knowledge of *how* is a vital aspect if Cura shall work as a medium of knowledge exchange
- Cura has been framed inexpedient prior to go-live
- Distributing the simulated environment earlier could be beneficial in aligning expectations
- Involving the end-users in an early stage could act as a solution towards the framing and expectation problems

We argue that these aspects must be considered when implementing a system, such as Cura, in other municipalities or when a new EHR system gets put to public procurement in Hjørring or Aalborg Municipality. But, in addition to the main takeaways, the educational part of the implementation was also highlighted as needing adjustments according to the informants. Instead of collective training lectures, the informants call for more hands-on teaching sessions in smaller groups with the system in hand. In 2014, when implementing EKJ in the elder sector (and later on in the social psychiatry), the training was different than with Cura. The former project manager of EKJ describes the EKJ training as:

> *It was not a big bang, but more gradual so that they [social workers] could begin nice and easy to document in there. [...] they started to practice nice and easy in the system and then they got six months, or something like that, where we could calmly integrate it [EKJ], area after area, facility after facility. (Appendix J, EHR-team project manager B, p.59, §7)*

With the Cura implementation more responsibility regarding training is left to each facility. This structure delegates responsibility to each manager, which resulted in different outcomes. At one DC a manager opened a full-time position for a superuser whose focus was dedicated to Cura. At the RA in Aalborg Municipality, the interviewed social worker described how lucky she felt that two municipality superusers, by chance, had their office at her facility, making her access to them easy.

The last three facilities, which we have been in contact with, describes the process a bit differently. These superusers still have to maintain their jobs as social workers, and thereby be a superuser on the side. This creates an unequal learning and teaching atmosphere. It shows how facilities with surplus resources to spend on the upcoming EHR integration experience the transition phases differently. Having someone to ask questions, readily at hand, is valued highly. It is a problem that the RA's, who employ Cura greatly, do not have the necessary time and resources to support the superuser. The simple solution would be, from a municipality perspective, to dedicate more resources, however, this is not always a viable solution. Instead of thinking terms of equally distributing the resources assigned to teaching and supporting the transition to Cura, it can be discussed if equity distribution makes more sense.

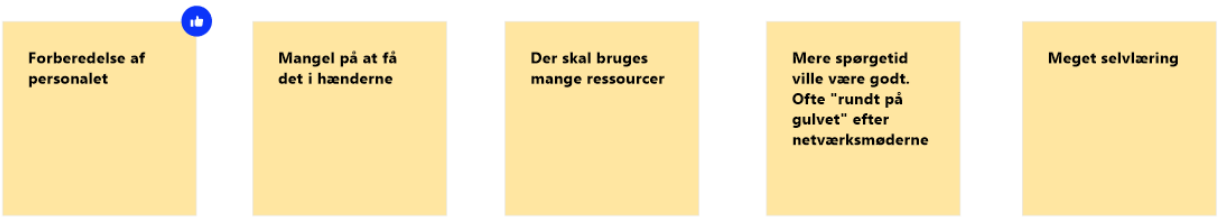

Photo 8: Extracts of the Client Journey with the superuser at DC. From left to right: "Preparation of front staff"; "Lack of hands-on teaching"; "Having to use a lot of resources"; "More time for questions. Often felt confused after the network meetings"; "A lot of self-studying." (Appendix L)

Photo 9: Extracts of the Client Journey with the social worker (superuser) at a RA. From left to right: "With the EKJ implementation there was more time for support to the superusers (special meetings for superusers)"; "The network meetings did not work optimally. It would be better to have the learning material handed out beforehand"; "More preparation or a different kind of preparation. I did not feel like I was prepared"; "I was lucky that I had a colleague who could assist me"; "Not enough time put aside. There was way more time with the EKJ implementation". (Appendix L)

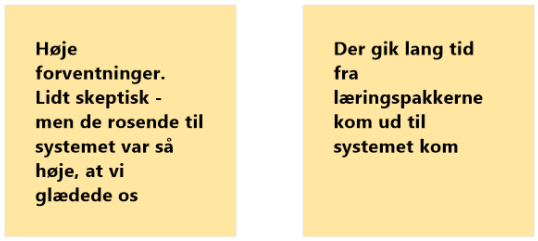

Photo 10: Extracts of the Client Journey with a social worker at a RA. From left to right: "High expectations. A bit skeptical - but they did praise the system a lot, so we were excited"; "There was a lot of time between the teaching material were handed out and the system was introduced". (Appendix L)

Photo 11: Extracts of the Client Journey with a nurse (superuser) at a RA. From left to right: "I was in doubt about how to answer questions when I was in doubt if I was properly prepared myself"; "They expected too much in relation to the handed out material"; "We had to schedule our own training sessions"; "There was not enough time to learn how to use the system"; We had concrete questions that were difficult to ask in the big crowds [at the network meetings]"; "It has required a lot from the superusers"; "The training should have happened at the facilities". (Appendix L)

The above photos show various preferences and desires towards the training. The aspect of peer-to-peer training and teaching at the facilities were mentioned by every informant. As a response to these requests, the EHR-team in Hjørring desires to create a *task force* that travels around to each facility

and thereby giving context-sensitive teaching sessions. Instead of creating a task force, we believe that aspects of the POVA could be considered. By using VoIP technology, it is possible to reach out to every superuser in social psychiatry from the town hall and give the social workers the context-specific peer-to-peer teaching that they request. Instead of having the EHR-team travel to each facility or conducting workshops at the town hall, designated time could be spent for video calls with desktop sharing for each facility requesting this extra support.

It is important to actively give the end-users a voice as early as possible in the implementation and design phase (Simonsen and Robertson, 2013). In an ethnographic research by Qian et al. (2019) about the work practice of nurses and care workers and the role of HIT, they stated that a system designer of an EHR system would acquire severe benefits if experiencing the work practice of nurses and care workers. "Just involving a few frontline nurses and care workers in the requirements analysis stage of system development to provide some isolated and disjointed feedback may not be adequate" (Qian et al., 2019 p.16). The quotation has similarities to how the front staff was involved in Hjørring Municipality. Social workers were incorporated in the early stages of implementation. One of the informants who was invited to the pre-implementation meetings describes:

> *"... we have been to the pre-meetings about what has to be done and what things we want. Those things have not been incorporated to the extent we had hoped for. I was at these pre-meetings with those who oversee the Cura system. [...] We believed, we advocated for our course very well and it seemed like they listened to what we had to say - that was until we got the system." (Appendix I, Employee C p.54, §21)*

We argue that it is important when designing, implementing, and arranging the training, that the end-users opinions and suggestions, must be considered. If a system is to succeed it must be based on the context of the potential end-users. The distance between Practice Frame and System Frame must be minimized. The social workers are the context experts of social psychiatry, and their understanding of the technology is essential. The social workers are not technology experts, but rather experts in their healthcare profession.

The increased usage of welfare and IT technologies within the health sector demand new knowledge required to provide healthcare service. The Danish research project 'Technucation' (Hasse and Brok, 2015) argues how professional competencies and technology cannot be separated; they are deeply intertwined. This thesis supports this claim. Technucation argues how technology as a *cultural force*

should be taught at the profession-specific education. There is no going back to the paper-based ways of healthcare. The technologies shape our society and professions, just as we shape them. Technologies' cultural effect on society is often neglected in favor of focusing on the engineer's creation (Borgmann 2006, p.352). Broadening the technological understanding, amongst the professions whose jobs increasingly consist of interaction with new and changing technologies, is important for empowering critical reflection of technology.

7.2 Discussion of Methodology

Co-present interviewing is commonly seen as the golden standard of interviewing as it is said to afford *thick descriptions* (Weller, 2017). With the increase of digital interaction of the past couple of decades, interest has been given to new possibilities of conducting interviews. Audio-only interviews are not a new topic and have been discussed for decades (Deakin and Wakefield, 2014), but utilizing video capabilities is a contemporary phenomenon (Weller, 2017). Combining VoIP technology with desktop sharing and participatory exercises are arguably more niche. The notion of 'distributed participatory design' (Danielsen et al., 2008) has been explored in 2005, but since then slowed down (Heintz et al., 2014). Distributed participatory design (DPD) is the use of online tools to support participatory design. The advantages of DPD are evident as it allows for a solution to the often expensive and complicated format of traditional face-to-face workshops (as in having participants and researchers traveling to the same location) (Heintz et al., 2014). Another example is Glassman et al. (2009) studying the use of desktop sharing as a teaching method. The research revolved around teaching people how to use and navigate a library online web service via desktop sharing. The study shows the power of such a method when reaching out to users at remote locations.

Online interview and mediated interaction are commonly regarded as part of the new 'methodological frontier' (Weller, 2017). We believe that online interviews are a powerful qualitative tool and should not be seen as a second-grade option to its co-present counterpart.

Online Participatory Exercises

The POVA exercises succeeded in bringing valuable knowledge about the context of the informants. This section will outline, what we argue was the limits of this approach, but also how future researchers interested in this methodology can overcome these hurdles.

In the POVA exercise the participants can see the Client Journey, but never feel the tokens and probes in their hands. In traditional workshops, a natural breathing room occurs as the participant's fiddle with the tokens, draws, builds, sort, or in any other way interact with the objects. This is a necessary element sparking reflection, as the participant weighs the pros and cons and visually sees the outcome as they interact with the various objects. This creative breathing room is hard to transform into an online setting. It is especially hard when the informant is not in direct control of moving tokens and writing the post-its. By not allowing for "hands-on" control, the only interaction the informant had was verbal communication - telling us what she thought and wanted.

Handing over control to the informant is not a straightforward task. We eventually decided on not allowing the informant to share their screen and instead share our own, so that the informant could see everything going on and verbally explain what she wanted and how tokens should be placed. This choice was taking based on the following reasons:

Technical implications. Online video meetings were for many of our informants a new ordeal. As described previously, we experienced a high degree of difficulties with setting up the online video meeting; one forgetting microphone, confusion on with platform to use, no video connection, loss of connection mid-interview, and a lot of email correspondence to make sure everything was working. Another implication was having the informant download the application: 'Microsoft Whiteboard'. This further puts a strain on the technical challenge. To make the whole experience easier, and more pleasurable for our informants, we decided to share our screen instead so there was one less thing to worry about for the participating party.

Privacy. When using the shared screen feature, your entire screen is broadcasted to all meeting attendees. If a participant is not fully aware of this there is a risk of them accidentally showing private items, texts, webpages, documents, etc. This risk is even greater as many of our participants were using their private devices due to them working from home at the time. Therefore, privacy was a big deciding factor.

Choice of Device. All our informants used different devices which is a challenge if the exercises demand interaction, other than verbal, on their part. One informant was on her work-laptop, one from her private pc, one from her private tablet, and the last from her private smartphone. We would

have preferred if all participants were on a laptop or desktop computer, but not everyone had a computer with microphone/video capabilities. By not being dependent on the participants to share screen, the options of devices were greater.

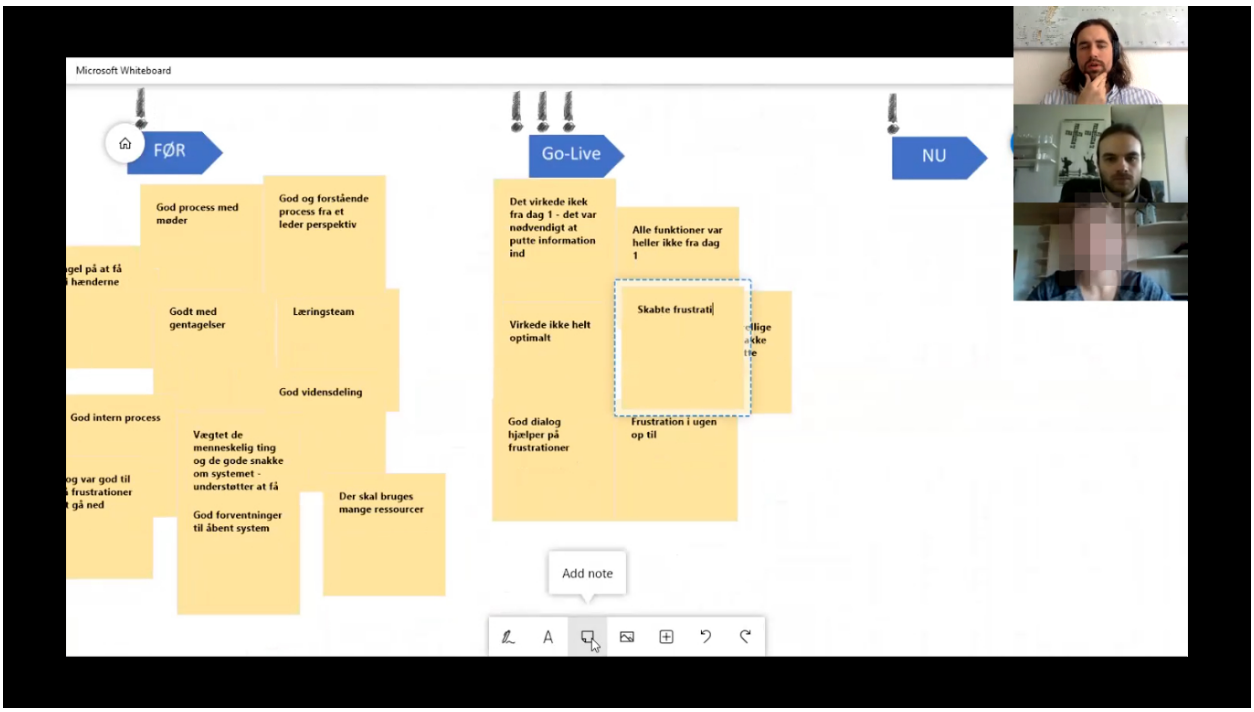

Photo 12: POVA in progress. Informant explaining her experience with the go-live phase while one researcher asks questions, and another makes post-its. All participants can see the Client Journey in real-time.

Ideally, we would have preferred having the participant taking control as we potentially missed out on some key participatory concepts. In this thesis, we have tried supporting the tell-make-enact philosophy (Brandt et al., 2013) via the exercises of POVA. One example is telling stories from the photographs taken or the tokens distributed. Researchers interested in doing participatory design via an online medium should investigate how to best incorporate these three elements digitally. One way to put more emphasis on the *make* and *enact* elements is handing over control to the informant and have them interact directly, instead of explaining to the researcher. Handing over control to the participating party is possible if enough preparation is put into it. The privacy and technical implications can, to a certain extent, be overcome by having the researcher's screen shared, but control handed over to the participant; meaning that the participant is controlling the screen, mouse, and keyboard of the researcher's computer. This circumvents the privacy aspect and does not require

the participant to download Microsoft Whiteboard as they are using the application on the researcher's computer. This feature is available on the application Microsoft Teams.

Software programs, and what is possible to do online, is constantly evolving. We have shown both limitations and possibilities of what is possible in an online workshop. We argue that researchers interested in this approach do not look at the digital medium as a second-grade option to co-present workshops, but rather seeks to exploit the advantages and possibilities of the format. Certain things do not translate well to the digital platforms, but the online medium allows for other participatory elements not possible in a traditional workshop. One such idea is a new form of design games. Design games are a staple tool in the participatory toolbox, utilized in many PD projects (Brandt et al., 2008; Vaajakallio and Mattelmäki, 2014). A benefit of the digital format is the ability to anonymous participants. A challenge often associated with PD is how to overcome power structures. In a workshop with a wide variety of stakeholders such as: managers, end-users, and experts it can be a challenge to empower all on an equal level; making sure that the end-user has enough *say* in the design as the expert. The ability to anonymous people to some degree could help reduce anxiety and empower a more equal debate, reducing the *fear of the presence.*

7.3 Other Application Fields

We argue that the research made in this study concerning the POVA workshop can be a useful tool in other application areas.

Lassen (2019) researched, in her Ph.D. thesis, the impact of welfare technologies on work practices. As a concrete example, she studied the effect that the implementation of *online home care support* (online bostøtte) has from a administrative, front staff, and citizen perspective. Bengtsson and Røgeskov (2012) describe home care support as: "The purpose of home care support is to support people with mental illnesses to live an active life and in their own house while being included in society. It happens in collaboration with the psychiatry treatment-department and under the observation of the 'minimal-intervention-principle'." (p.11) (Translated)

When combining the *online* aspect to home care support it incorporates the use of digital technologies, such as tablets. Incorporating online communication tools have changed the home care

support practice. With the new technology, the need for physical visits have been reduced since some aspects of the support can be handled by communicating online through Skype.

Lassen (2019) describes how social workers use the specific technique *shared space* (et fælles tredje) when having conversations with the citizens. The purpose of the technique is to change the perspective of the conversation from the difficult and intimate topics, about the citizens' well-being, into something completely else: the weather, television program, or a physical object in the citizens home. Hereafter they can slowly move the conversation into the difficult topics again. The use of the shared space technique takes place when the social worker is physically visiting the citizen. (ibid.)

We argue that it is, to some extent, possible to digitalize and recreate this technique with the use of aspects of POVA. With the use of desktop sharing, it is possible to make a shared space of which the conversation can revolve around. This would only be a possibility when the social worker has created a healthy relationship with the citizen and gained knowledge of his/her interests. The focus of the conversation could, therefore, be linked to the photo, video, or press cuttings that the social workers show by using desktop sharing.

> *"She walks over and picks up a rosehip from a bush outside the window. [...] I ask the employee what she is preparing. She explains that a citizen, who cares a lot about flowers, is visiting and this is a method to show her that she is conscious of what these mean to her." (Lassen, 2019 p.194-195) (Translated)*

The quotation above describes how a social worker prepares her physical meeting with a citizen by decorating the table with flowers since the citizen is fond of flowers. We argue that by using the shared screen feature when communicating with the citizen online, taking a few photos of flowers and presenting them, could act as something recognizable and as a shared space. By using the desktop sharing feature the social workers can structure the online conversation about the visualization, and thereby maintain the use of the shared space technique when doing online home care support.

Another idea is incorporating the photography exercise. Doing Skype meetings, the social worker gets very little insight or visual impressions of the citizens' life. By giving the citizen a photography task of taking photos of their daily life, the social worker would get a small insight into the citizens' lifeworld. No matter what, the photos would serve as a conversation starter to ease conversation to the more difficult topics.

These ideas depend on the level of technological expertise, by both parties.

7.4 Concluding Remarks

Doing participatory projects and utilizing the digital platform to engage and empower participants holds great promise. It requires a great deal of preparation from the researcher in making sure everything is set up and ready to go. However, doing workshops online transfers some responsibility to the participating party. In a traditional co-present workshop or interview, the only thing the informant must do is show up, as the researcher is in charge of equipment, supplies, etc. This is not the case online as the participant, as a minimum, must have access to a device, the chosen VoIP platform as well as a working microphone, webcam, and reliable internet connection.

The obvious benefit of doing interviews and workshops online is the inclusive element. Having the ability to include stakeholders without the need for them to travel. This aspect alone is enough to justify the merit of the method. However, as inclusive and democratic this aspect seems, researchers must be aware of the paradox at work here. By choosing an online digital medium we are in the same way excluding certain actors as the medium requires technical expertise of the participating party. We argue that these actors are often the most interesting, and in many ways the actors we want to empower. Chris Showell and Paul Turner (2013) describes how personal health records are often designed for 'People like us':

> *"Current approaches to designing, implementing and evaluating personal health record systems reflect the attributes and assumptions of well-educated and well to-do users (People like Us: PLUs) rather than the needs of the most disadvantaged in society (the disempowered, disengaged and disconnected: DDDs)." (Showell and Turner 2013. P. 1037)*

If researchers are interested in using POVA, either within the domain of EHR evaluation or other application fields, the researcher must consider this: does the digital method exclude certain actors from the research? Undoubtedly this has also been the case of this thesis as we mostly have been put into contact with superusers (which must be assumed as technological savvy). A traditional co-present workshop would have been able to include other voices, less keen on doing online VoIP

interviews. This paradox, we argue, is the greatest challenge for researchers seeking to do PD on digital platforms.

Despite these challenges, we argue that the possibilities, as highlighted, have such promising potential that future researchers should not be discouraged if these implications are considered.

8. Conclusion

In this thesis, we have studied a new EHR system for the social psychiatry with disabled and socially marginalized adults in Hjørring and Aalborg municipality. The objective of the thesis has been to study the implementation and use of Cura Social. We argue that knowing socio-technical ramifications of an implementation project, such as Cura Social, can support similar future projects. This knowledge is important because EHR systems are constantly being developed and replaced, and have shown to be notoriously difficult to implement successfully. This led to the problem statement:

How can the implementation of Cura Social in the social psychiatry be understood as a socio-technical challenge?

- *How is the implementation experienced by the social workers?*
- *What can be done to support future similar implementations?*

Understanding how Cura Social can be understood as a socio-technical challenge demands a broader understanding of technology. Müller's sociotechnical theory emphasizes how technology should be understood as part of a dialectic relationship between: technology, organization, knowledge, and product. The analysis of Cura has shown how changes in one aspect have a qualitative effect on the others. Introducing Cura demands new knowledge, division of labor, routines, and influences the end product. This end product: *the best possible care for the citizens* should not be mistaken for how well the system succeeds in exchanging data, because - as this study has shown - it is not possible to study Cura in a vacuum. Despite this, the new open approach to data exchange does have promising capabilities for the end product as especially the citizens' transition from residential to day center can be facilitated with more knowledge than prior due to the social workers' improved access to information. However, for this exchange of data to be advantageous in the long run it is not enough to have a system in place which possesses the ability to exchange data alone. Knowledge of *how* data should be exchanged is just as, if not more, important. If Cura is to act as a boundary object between these communities, coherence in the required knowledge of how to structure the data is needed.

How is the implementation experienced by the social workers?

The expectations towards the system were high and the actual system did not live up to the promise. The symbolic expression that the system communicates to the users via pre-meetings and learning material where not in line with the experienced reality. When the system went live the cognitive

workload increased as previously routine tasks had to be relearned. Furthermore, the system was experienced as missing features (e.g. the diary option) and complicated mundane tasks, such as getting up to date on each citizen. We argue that Cura is still in the early phase of implementation. Despite the difficulties in the go-live phase, many informants expressed a positive outlook on the future with Cura.

What can be done to support future similar implementations?

It is evident from this study that initiatives can be taken to support similar implementations. EHR systems should not be framed and praised too highly prior to go-live as this is certainly bound to collide with reality. Instead, a broader understanding of the ramifications of technology must be articulated by the social carriers of technology to align expectations.

Another clash was the collision between frames (Practice Frame and System Frame), we argue, that users must not only be heard but also proactively involved in the assessment process. By doing so, knowledge of the unique and tacit work procedures has a better chance of being accounted for in the technology, and major changes can more easily be undertaken.

This thesis has shown an alternative approach to reactive assessment. Participatory Online Video Assessment allows for an insight into the end-users work practice despite geographical obstacles. To assess an EHR system, a deep empirical insight into the work practice is necessary. Longitude qualitative studies are often time and resource consuming, where this thesis has shown an alternative and useful tool to engage and explore the socio-technical ramifications of technology implementation through online platforms. Participatory and online interviews are a promising methodological frontier though researchers must be mindful of the different contexts it can create for making rapport and democratic inclusion.

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