Application of Welfare Technologies in Elderly Care in Denmark

A Case Study on the Implementation of Welfare Technological Solutions in the context of Public Social Innovation in Elderly Care in the Municipality of Copenhagen

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Mikkel Gottlieb

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Abstract

Danish Elderly Care is currently threatened among other issues by a significant lack of "warm hands" and rapid demographic development. Recently, there has been a radical reduction in funds for public health care services, while citizens expect higher quality in these services. These challenges put heavy pressure on the Danish municipalities to develop new solutions, in order to secure the future of the Welfare State. This thesis aims to investigate the application of the relatively new phenomenon of welfare technology in the care of the elderly in Denmark. The thesis takes as its focal point the three welfare technological solutions; *Electronic Bidet Toilets, Eating Devices and Safe-Transfer Technologies*, that were adopted as policy in the Danish Municipal Finance Management Act from 2014.

From an analytical perspective, the thesis suggests that a social innovation lens may be able to identify the potentialities of welfare technological solutions to address the aforementioned societal issues. The purpose of the thesis is, therefore, partially to consider welfare technology from a social innovation perspective. However, the application of welfare technologies has also been met with severe scepticism in Danish society and there is anecdotal evidence that points towards a de-humanising of care and the firing of employees.

The thesis then attempts to critically investigate the implementation of the three main solutions in the municipality of Copenhagen that in recent years has become a pioneer within the field of welfare technology. The emphasis is partially on identifying how the municipality works with welfare technology, and partially on examining the main challenges that arise from the application of these technologies. The thesis concludes that while there is significant socio-economic potential in the application of welfare technologies, these potentials are not yet fully exploited.

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List of Abbreviations

The following describes the various abbreviations used throughout the thesis, and also presents an overview of the applied tables and figures.

SUF	The Health and Care Administration in Copenhagen Municipality
KL	The Local Government Denmark
EMES	European Research Network
3BL	The Three Bottom Line Framework
VTV	Welfare Technological Assessment
BRUS 2015	User-surveys conducted by SUF

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Clarification of Concepts and Institutions in the Field:

The following is a list of the various concepts used throughout the thesis. Each concept is followed by a short clarification that will be explained further in the research.

Auxiliary Services	*Refers to the entity of SUF in charge of distribution and maintenance of welfare technologies*
Demographic Challenges	*Refers to the challenges related to the increasing number of elderly citizens in Denmark.*
Elderly	*Refers to elderly people who have some sort of reduced physical function that makes them not able to handle certain tasks.*
Elderly Care	*Refers to the daily routines at care centres or in home care, e.g. hygiene, house work etc. where the elderly need assistance.*
Health and Care Administration (SUF)	*Refers to the municipal institution in charge of health and care in Copenhagen*
Healthy Growth (Sund Vækst)	*Refers to the entity of SUF in charge of finding, testing and implementing new welfare technological solutions*
Local Government Denmark (KL)	*Refers to the largest municipal interest organisation in Denmark.*
Municipal Finance Management Act 2014	*Refers to the political agreement between the former Danish Government, the Danish Municipalities and KL, where four specific welfare technological focus areas were agreed.*
Public Social innovation	*Refers to new ideas, processes or products delivered by the public sector that meet social and economic needs in society.*
Self-Reliance	*Refers to the individual's ability to take care of themselves.*
Technical Aids	*Refers to the practical tools used in healthcare services for persons with disabilities.*
Value Tree Model	*Refers to the model used by several Danish municipalities for analysing social and economic gains in relation to Welfare Technology.*
"Warm Hands"	*Refers to the group of public health care assistants working at either care centres or in home care.*
Welfare Technology	*Refers to new technologies that assist elderly people with special needs. The thesis takes as its focal point, the three welfare-technological solutions derived from the four political focus areas.*

1.0 Introduction

The purpose of this section is to introduce the area of investigation of the thesis. A presentation of the motivation and relevance of the research has further been included.

1.1 Problem Area

The country of Denmark has for years received worldwide acknowledgment for its admirable model of a welfare state that cares for the weakest in society. The Danish welfare tradition is based on equal rights legislation, which secures a generally consistent access to healthcare and other needed services, for the aging population. However, in recent years the Danish welfare state – and particularly Elderly Care has been the subject of heated debate and continues to be under immense pressure. First and foremost Danish citizens are becoming less and less interested in engaging in Elderly Care and several forecasts illustrate that there will be a significant lack of "warm hands" in the future. As a result of this drastically decreased interest, it is estimated that Denmark will be short of up to 5000 social and health care assistants, 5000 nurses and 2000 specialists from 2015-2020 (Monday Morning, 2009a: pp. 10-11).

Furthermore, Denmark is currently experiencing a rapid demographic development and it is estimated that the proportion of people over 65 will increase from about 17 per cent today to around 20 per cent in 2020. In the light of the fact that the elderly population nowadays is healthier than ever and lives longer, the need for care occurs at a later age. However, the demographic development will inevitably increase the costs related to public healthcare, and it is expected that by 2050, public health spending will rise to over 10 per cent of the Danish GDP (Force Technology, 2013). Following the aftermath of the global financial crisis, the Danish government has integrated a tight state budgetary control making it difficult to increase further funding for Elderly Care. Considering the fact that Denmark already has one of the highest tax levels in the world, alternative initiatives are required in order to secure the future of Elderly Care in Denmark. Therefore, the government has embarked on a comprehensive transformation of Elderly Care that will have profound consequences for all Danes many years into the future.

The modernisation has been shown in various forms of welfare technologies, in particular, where developments have initially been focused on the introduction of mobile technology such as Personal Digital Assistant (PDA) for staff in care centres (Nielsen, 2010: pp. 9). Recently, the emphasis has shifted to be focused more on user-

driven technologies for elderly citizens (e.g. Robotic Vacuum Cleaners, Electronic Bidet Toilets, Robotic Seals etc.). The purpose of welfare technology is partly to reduce cost of service to the elderly and to improve employees' work environment, while allowing citizens to a greater degree to be wholly or partially self-reliant (KL, 2015b: pp. 2). This increased self-reliance will then provide the elderly with an improved quality of life and less need for care. Furthermore, it is expected that welfare technology can become a powerful engine of growth by creating a new field of employment that can ensure Denmark a strong position in one of tomorrow's most lucrative global markets. Thus, the application of welfare technology can in many ways be viewed as a miracle cure to accommodate these particular issues within the current Danish healthcare system (Reiermann, 2010: pp. 18-19).

In addition, innovation in the public sector in Denmark has for years been a debated area and the sector is still perceived as overwhelmed by unnecessary bureaucracy, stagnation and economic inefficiency (Jakobsen, 2013: pp. 230). However, the increasing focus on welfare technology in the Elderly Care can seem to represent a radical new way for municipalities to produce and provide public services. The introduction of welfare technology may signal that a new era in the area of health care has begun. Despite this, it can be argued that there is a lack of understanding of the correlation between welfare technology and innovation in Danish public sector. This may be because only a few studies have been conducted and articles written in the area. This thesis will attempt to address this lack of knowledge by interpreting welfare technology from a social innovation perspective.

In 2014 the Danish government decided on a national dissemination of four welfare technology focus areas. Three of them, respectively: *Electronic Bidet Toilets, Eating Devices and Safe Transfer Technologies*, represent specific solutions to needs and issues in the Danish Elderly Care. The 2016 Status Report from KL concludes that the three solutions have been implemented in 87 municipalities (KL, 2016a: pp. 2). One of those is the municipality of Copenhagen, which is often perceived as a pioneer in the use of welfare technology in Elderly Care. In 2015 the municipality used a total of 77 million DKK on new welfare technological solutions and it is estimated that this will rise to around 84 million in 2016 (Berlingske, 2016a).

However, the application of welfare technology and the implementation of the three solutions have also been viewed with certain scepticism. Despite the positive incentives, welfare technology has been the subject of severe criticism due to an accusation that the care provided will lack the human touch. It is also argued that municipalities are claiming a shortage of funds. Another point of criticism is that

employees and citizens are sometimes not involved in the implementation process, which is decided at a municipal and political level. Therefore, it can be considered that there are certain challenges when implementing Welfare Technologies. For this reason it is crucial for municipalities to be aware of such challenges in order for citizens, employees, and municipalities to benefit from the technologies. By a critical investigation of these challenges in the implementation of welfare technology in the municipality of Copenhagen, the thesis attempts to respond to the problem formulated below.

1.2 Problem Formulation

Table 1: Problem Formulation
How can welfare technologies be viewed from a social innovation perspective; and what are the main challenges associated with the application of the three main welfare technological solutions in the Municipality of Copenhagen?

The purpose of the first part of the thesis is to interpret "welfare technology" from the perspective of social innovation. This will be structured by initially defining "welfare technology" as an umbrella term for technological solutions used by function-reduced users. This will be followed up by defining "public social innovation" with reference to the core elements and features of "social innovation" derived from the Young Foundation (2012b). From this, it is considered that social innovations can be viewed in relation to new products, services and processes. The emphasis will then be on the specific solutions derived from the three of the four politically agreed focus areas that include; *Electronic Bidet Toilets*, *Safe Transfer Technologies*, *Eating Devices* and *Better Use of Technical Aids*. Since the latter does not represent a specific solution it has not been included in the thesis. These solutions will then be analysed as socially innovative products that will be followed up by an investigation of the core process of welfare technology.

The second part of the thesis takes for its focus around the application of the three solutions in the Copenhagen Municipality. The aim is to identify and map analytically, the main challenges that influence the implementation, which will then lay the foundation for the later discussion.

1.3 Research Questions and Project Design

When conducting a research study based on such a broad field as *Welfare Technology*, it is essential for the researcher to develop clear research questions. These can act as overall guidelines for the research and ensure that the subject field can be covered more fully, with more structure and in more depth. Therefore the following research questions have been developed:

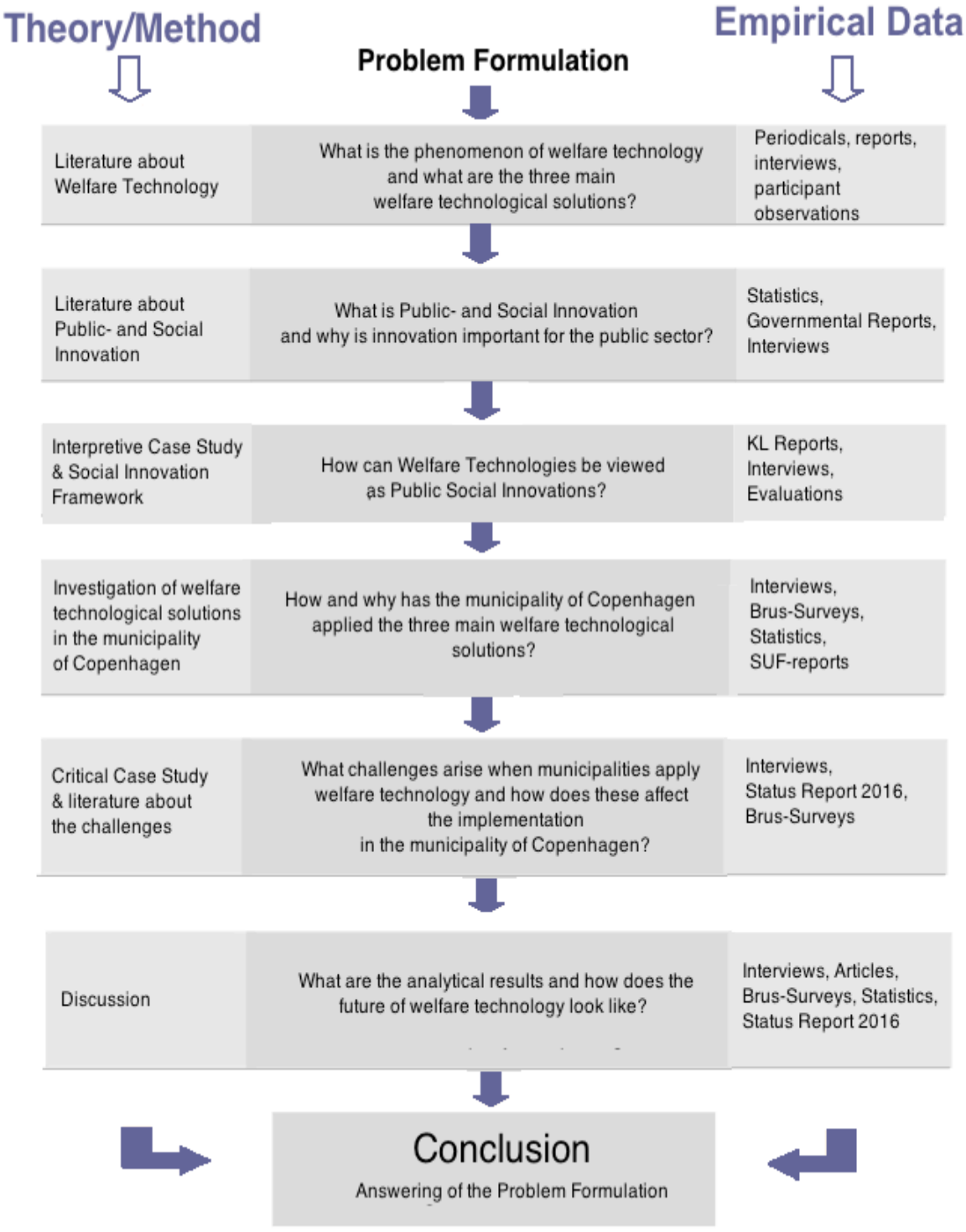
Table 2: Research Questions

1) What does the notion of welfare technology entail and what are the three main welfare technological solutions agreed in the Municipal Finance Management Act 2014?
2) How can the process of welfare technology and the three solutions be viewed from a social innovation perspective?
3) How is the municipality of Copenhagen applying welfare technology and the three solutions in their provision of Elderly Care?
4) What kind of challenges arises from the application of welfare technologies and how do they affect the implementation process in the Municipality of Copenhagen?

The thesis has been organised around the above four research questions in order to ensure a logical progression. The research will therefore progress taxonomically by moving from the descriptive content to the analysis, which will then provide guidance for a discussion and will lead through to a conclusion.

The first research question is mainly of a descriptive nature and aims at defining welfare technology and the three welfare technological solutions. The second question is based on interpreting welfare technology within the framework of social innovation. This is done by conducting an interpretive case study of welfare technology based upon the core elements and features of social innovation. The third question aims at analysing how the municipality of Copenhagen applies welfare technology and how it has implemented the three solutions. The fourth question has both the perspective of analysis and discussion, and identifies the main challenges to the application and implementation of welfare technology in the municipality of Copenhagen. This is structured by a critical case study that ensures a more nuanced understanding of welfare technology. The case study will be based on the challenges that have arisen both from a 2013 KL-report (KL, 2013j) and from the empirical data material. This will then lead to a discussion regarding the future of Welfare Technology in the Danish healthcare sector. The research questions have been revised continuously throughout the research process in order to ensure that they correspond well to the problem formulation and the empirical data collection. In order to demonstrate the thesis's process, a research design has been developed:

Figure 1 - Project Design



Author's own model

1.4 Motivations and Relevance

My motivation for writing this thesis originates from a strong interest in the societal challenges that Denmark will continuously face in the near future. As a student of social entrepreneurship it is therefore of my curiosity to "think out of the box'" and to research on solutions to persistent societal challenges. As mentioned, Elderly Care in Denmark is currently threatened by limited jobs in the sector, decreased government funding and the extended lifetime of elderly people that will increase the need for care in the future. Thus, there is a growing need for innovative solutions in the public sector to deal with these challenges, while still maintaining a high level of healthcare services. In addition, welfare technology seems to be a potential solution to several of these problems, and this contemporary phenomenon, therefore, seems worthy of investigation.

Nowadays, the understanding of innovation has changed drastically and there are several branches with divergent characteristics. While, welfare technology is often considered to comprise user-oriented technologies, the term has been linked to the theoretical school of user-driven innovation. User-driven innovation is mainly differentiated from other kinds of innovation by how involved the user is. It can be argued that this branch of innovation does not take the bottom lines of the specific innovation into account.

On the other hand, the branch of social innovation entails several of the elements from the user driven innovation, but also draws on the social and economic gains derived from the innovation. Therefore, social innovation has been selected in the thesis as a relevant type of innovation in order to study the phenomenon of welfare technology. However, from a scientific point of view, this type of innovation has been criticised because it lacks a clear conceptual grounding. According to one of the leading researchers in the field; Frank Moulaert, the existence of various definitions has led many researchers to abandon the scientific use of the concept (Moulaert, 2013: pp. 14). For this reason, an additional motivation for this thesis is to contribute to the field of social innovation by developing a framework for further research. This is done, by revising the different definitions, starting both from the definitions given by various researchers, and from those available in political documents such as the reports produced by the Bureau of European Policy Advisers (BEPA) and The Young Foundation (2013). From this, certain core elements and features will be illustrated that together form the social innovation framework, which will later be used in the interpretation of welfare technology.

There is very limited published material relating to welfare technology - especially with a social innovation angle. The academic studies conducted in the area of welfare technology are commonly in Danish and emphasise the implementation of a certain technology at specific care centres (Hellesen & Nøhr, 2013, Dreyer et.al, 2013). This thesis is the first academic study to focus on the three technologies derived from the Municipal Finance Agreement 2014 - the foundation for the implementation of welfare technologies in Denmark.

The focus of the mentioned academic reports is mainly on the interplay between the health care assistants and the elderly target groups and the challenges they experience. This thesis, by contrast, investigates the challenges from a municipal perspective, while integrating a social innovation. Furthermore, my motivation for writing the thesis stems from a former position as a student assistant in the Centre for Welfare Technology in the Local Government Denmark (KL). Here, I was working with the national implementation and monitoring of welfare technology. However, this was mainly on a national level and my interest is to examine the implementation on a more practical municipal level in the municipality of Copenhagen.

1.5 Delimitations

Through the research I have encountered certain limitations and challenging aspects that will be presented in the following. Initially, the focus of the thesis was the practical implementation of welfare technologies at a selected care centre in Copenhagen. The idea was to investigate the implementation through a case study structured by focus group interviews and single interviews with staff members, in order to identify the challenges for welfare technologies on a practical level. Furthermore, it was also expected to conduct questionnaires with residents, in order to measure the satisfaction rate with the implemented technologies. However, this proved difficult due to a lack of resources and time in care centres. For this reason, it appeared more appropriate to change the research to an investigation of the municipal implementation of technologies in Copenhagen.

As mentioned earlier, welfare technological solutions are applied in connection with public health services, especially in the area of drug abuse, disability and elderly care. This thesis is solely based on solutions in the latter area, due to the fact that the majority of municipalities are focusing specifically on initiatives in this area. In addition, there are numerous welfare technological solutions in the area of elderly care. Thus, it has been necessary to narrow the research down to three out of the four main political focus areas decided in the Municipal Finance Agreement 2014. It is important

to notice that the focus area of *"Better Use of Technical Aids"* is viewed in this thesis, in line with KL, as a working method rather than a welfare technological solution (KL, 2016: pp. 5). The area is therefore not included in the analysis of the welfare technological solutions.

As noted, the implementation of welfare technology involves various stakeholders (i.e. the municipality, staff, companies, elderly etc.) resulting in differing views on welfare technology. The scope of the thesis has been limited to focus mainly on the interests from the municipality perspective. However, the views from the elderly and staff are still represented in the interviews and in the user surveys (the BRUS Surveys 2015) conducted by the municipality of Copenhagen. The single case study has been selected over the multiple case study, due to the limited resources and time, which I, as a single thesis-student do not have available. The fact that Copenhagen can be viewed as a pioneer in its deployment of Welfare Technologies, and is seen as a flagship for other municipalities, suggests that the results may be considered applicable to other municipalities.

As mentioned, it is often acknowledged that welfare technology represents a significant growth and business potential for Danish industry. The thesis recognises this potential, but it should be stressed that this business perspective has not been investigated. Moreover, it is important to note that within research on innovation there exist several branches with different focuses, for example, user-driven and collaborative innovation theories. This thesis is solely emphasising on social innovation, as this innovation theory seems most appropriate in relation to the objective of addressing certain social needs through welfare technology.

2.0 Methodology

The following is a brief introduction to the methodological approach. It presents the philosophy of science, the analytical strategy and the various data methods and sources applied throughout the thesis.

2.1 Philosophy of Science

Generally, there are three ways to apply the philosophy of science when conducting a scientific report. Firstly, you can choose a direct scientific theoretical problem formulation. Secondly, you can apply philosophy of science every time a decision is made in the research. Thirdly, you can avail yourself of the philosophy of science *ad hoc* when there is a relevant question (Fuglsang & Olsen, 2009: pp. 12-13). In order to be able to answer the problem formulation presented in the previous section, a qualitative

analysis is conducted based on the method of philosophical hermeneutics and critical realism. This is due to the aim of defining and interpreting welfare technology from a social innovation perspective, as well as critically mapping the challenges that affect the application of welfare technology in the municipality of Copenhagen. It can therefore be argued that the thesis has primarily been developed around a theoretical scientific problem formulation, due to its interpretive and critical nature. The scientific theories have been applied throughout the research process by constantly reflecting on the subject field and the results from the empirical data. In addition, the theories have also suggested guidelines on how the interviews should be conducted e.g. through the hermeneutic circle where my preconceptions have been challenged. Moreover, the critical realism has determined what can be concluded and how sharp the conclusions are.

2.1.1 Philosophical Hermeneutics

Both welfare technology and social innovation can be argued as poorly conceptualised since there are no clear definitions of either concepts. Therefore, it has been crucial to develop a subjective understanding of these concepts, which is why philosophical hermeneutics has been selected in the first part of the research that is based on interpreting welfare technology within a social innovation perspective.

Hermeneutics is originally a Greek research tradition derived from the technical term of; *"hermeneia"*, meaning interpretation or translation (Palmer, 1969: pp. 12). Traditionally, hermeneutics was viewed as a discipline that indicated a method for the interpretation of theological and legal texts. In the beginning of the 19th Century, the German theologian, Friedrich Schleiermacher developed the method further and claimed that it could be used for interpretation of all kinds of texts (Juul, 2012: pp. 116).

Generally, there are four major types of hermeneutical approach; the traditional, the critical, the methodical and the philosophical (ibid, 2012: pp. 107). This thesis is largely based upon the latter approach due to the importance on the interaction between the subject field and the researcher, which in this case is the understanding of welfare technology (ibid, 2012: pp. 108). The theoretical school of philosophical hermeneutics was initially theorised by the German philosopher Martin Heidegger who brought together the ideas of hermeneutics with the philosophy of phenomenology (ibid, 2012: pp. 120). The approach was then further developed in the 1960's by Heidegger's disciple Hans-Georg Gadamer when he published his famous "*Truth and Method*" (1960). With this work, Gadamer remodelled Heidegger's

approach so radically that since then, philosophical hermeneutics has been associated with his name (Juul, 2012: pp. 121).

The first part of the thesis is, therefore, built upon a Gadamerian hermeneutical approach, where the main goal is to seek an understanding of the phenomenon of welfare technology, rather than to offer an explanation. In accordance with Gadamer, I therefore strongly believe that a requisite for developing new knowledge depends on the interface between the researcher and the subject field. Thus, I have, arguably, interacted with the subject field by conducting three semi-structured qualitative interviews with implied actors within the area of welfare technology, as well as participating in two Network meetings with 38 welfare technological consultants.

In line with Gadamer, the ontological point of view in this thesis is that the acquisition of new knowledge derives from the interpretation of the subject field (Juul, 2012: pp. 120-121). When working with a philosophical hermeneutic approach, it is essential that the researcher first describe their prejudices related to the subject field. This is due to the fact that the starting point for any interpretation is the prejudices that the researcher brings in the process of understanding (ibid, 2012: pp. 143).

According to Gadamer, a prejudice can be defined as a view that a researcher holds before entering a given field that will affect his or her judgment. These prejudices derive from culture, tradition and history, and are not definitive but are constantly evolving. All together the various prejudices constitute a preconception of the subject field (ibid, 2012: pp. 124-125). In addition, the research was launched by certain prejudices about the phenomenon of welfare technology and social innovation derived from first-hand knowledge as a former student assistant in KL's Centre for Welfare Technology, as well as a researcher of social innovation.

Table 3: Prejudices on Welfare Technology and Social Innovation

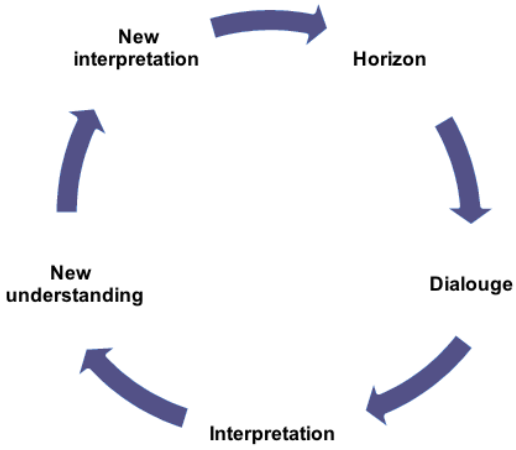
- The fields of welfare technology and social innovation are characterised by various definitions and there is a poor conceptual frame of reference in both fields.
- Welfare technology entails various stakeholders. Its application can lead to several socio-economic gains for the elderly citizens, staff and municipality. Various stakeholders and the creation of socio-economic gains are also principles in the field of social innovation.
- There are certain underlying challenges that affect the implementation of welfare technology.

Based on the above listed prejudices, I have a preconception that a successful application of welfare technology can be a strategic tool for municipalities to accommodate the issues within the current Danish healthcare system. This is because welfare technologies entail various gains for citizens and staff, which will limit the costs for public services. However, if welfare technologies are implemented only with the aim

of reducing costs and without the consent of the elderly and the staff, it will limit the socio-economic potential and inevitably end up in damaging the personal care. When the prejudices and the preconception are put together they create a so-called horizon of understanding, which can be viewed as my basis for interpreting welfare technology from a social innovation perspective (Juul, 2012: pp. 125). In accordance with Gadamer, I believe that the notion of prejudices should be perceived positively, since they are of vital importance for me in order to be able to interpret the concept of welfare technology. In addition, it can be claimed that a researcher would be forfeited without prejudices, because he or she would not be able to ask the important research questions without initial knowledge of the studied concept (Juul, 2012: pp. 422). According to Gadamer, it is, therefore, essential that the researcher bring his or her prejudices into action in the subject field (Juul, 2012: pp. 124). My initial prejudices and preconception of welfare technology and social innovation have, therefore, been constantly challenged and put into play in the empirical data collection, and especially in the conducting of semi-structured interviews. In addition, professor Kirsten Hastrup argues that the use of this specific form of interview tie in well with the philosophical hermeneutic approach. This is due to its open structure, which gives the option for the display of both the researcher's preconception and prejudices and the informant's own perspective of the concept (Hastrup et al. 2011: pp. 76).

One of the key features in the hermeneutic tradition is the idea of the hermeneutic circle. The circle consists of the principle that the researcher must understand the parts from the whole and the whole from the parts (Juul, 2012: pp. 110). Traditionally, it is characterised by the fact that the researcher stands outside the circle and interprets the object's parts and wholes. Gadamer's hermeneutic circle is slightly different since it stresses the importance of the involvement of the researcher in the process of understanding (Juul, 2012: pp. 111). The circle, illustrated on the next page, instead describes the subjective process that the researcher experience when interpreting the empirical data.

Figure 2 – Gadamers' Hermeneutic Circle



Author's own model

As mentioned, I began the research with a certain horizon in my understanding of welfare technology and social innovation based on my initial prejudices and preconception. In line with the Gadamerian circle, my horizon was then confronted in the dialogue with the implied actors within the area, and the first interpretation of welfare technology within social innovation occurred. The interpretation then resulted in a new understanding that entailed new elements in relation to my previous horizon of welfare technology and social innovation. Based on the new understanding this automatically led to a new interpretation of welfare technology within social innovation, which again entailed the establishment of a new horizon of understanding (Juul, 2012: pp. 112). In this case, it means that the outcome of the first part of the thesis will be a subjective interpretation of the concept of welfare technology and social innovation.

In addition, hermeneutics work from an epistemology that views the social world as an interpretation that will always be uncertain and open to discussion (Juul, 2012: pp. 144). When working with a hermeneutic approach, it is, therefore, not possible to reach a final universal truth about the nature of welfare technology. Thus, I can only develop suggestions on how welfare technologies can be understood as social innovations (ibid, 2012: pp. 145).

2.1.2 Critical Realism

The scientific research tradition of critical realism is especially useful when critically investigating a contemporary phenomenon, and can thus be considered as being appropriate in connection with the aim of critically examining the implementation of the three welfare technologies in the municipality of Copenhagen. Critical realism is a

relatively new scientific research tradition, which arose in the 1970s with the English philosopher Roy Bhaskar as the founder (Danermark et al., 2002: pp. 4-5). Like several other scientific approaches, critical realism was developed based on critiques of other scientific understandings. More notably, critical realism can be viewed as a departure from the positivistic approach and its understanding that reality can be experienced and observed through the senses, and that knowledge is therefore limited to pure sensory data (ibid, 2012: pp. 8). Instead, critical realists claim that reality is arranged in three domains; the *empirical*, the *actual* and the *transcendent*, illustrated underneath.

Table 4. The Three Domains of Critical Realism:

- **The empirical domain**: *raw data; observations that have been made without being processed.*
- **The actual domain:** *processed data; meaning trends and events in the subject field.*
- **The transcendent domain:** *underlying causes; which cannot be directly observed.*

(Danermark. et al., 2002: pp. 20)

At the top is the empirical domain, which consists of the researcher's own experiences in the subject field. The empirical domain can be viewed here as my own understanding of welfare technology derived from working in KL's Centre for Welfare Technology. Then you have the actual domain, which is constituted by the phenomena that exist and the events taking place. In this thesis the actual domain can be viewed as the implementation of the three welfare technological solutions in Copenhagen in either care centres or in home care. If one combines the empirical and the actual domains they constitute a reality that consists of events and experiences. This is also named the intransitive domain and can be viewed as the ontological world of critical realism (Danermark, et al., 2002: pp. 9).

Critical realists claim that such a picture of reality is without depth, since it is reduced to empirical observable events. Thus, the observation of a given phenomenon must be extended rather than being reduced to the empirical level only (Danermark et al., 2002: pp. 22). A well-known way of illustrating critical realism is to picture society as an iceberg. Ten per cent of the iceberg is above sea level and can be directly observed by the researcher. The rest is located below the water surface and cannot be directly observed. Thus, the researcher must, opposite to positivism, not only deal with what is above sea level, but also study the part of the iceberg that is hidden below the surface (Jespersen, 2009: pp. 150-151).

In line with the critical realism, the research, therefore, perceives that the implementation of welfare technologies may be subject to underlying challenges that are essential to uncover, in order to acquire adequate knowledge. With this in mind, the

thesis attempts to investigate the underlying challenges by providing insights into the implementation process based on critically exploring it from a municipal level.

In order to increase the understanding of the transcendent domain, the critical realists usually apply the method of retroduction, where both elements of induction and deduction are used (ibid, 2002: pp. 11). Thus, critical realists do not consider induction and deduction as opposites, but rather as complementary methods. In addition, the thesis applies the retroductive method by first observing the outcomes in the form of the case study that illustrate the implementation of the three welfare technologies. These are then combined with hypothetical deduction, ending with a causal explanation of the challenges that arise in the implementation.

In addition, critical realism argues that it is only possible to obtain probable knowledge, due to the fact that the ontology should be seen as an open evolving system (Jespersen, 2009: pp. 148). This can be illustrated with the proposition that "*one can never bathe in the same river twice*" (Jespersen, 2009: pp. 152). Therefore, knowledge of the subject area will always be contextual and determined by the historical context (ibid, 2009: pp. 160). Thus it will never be possible to reach a definitive truth, and the thesis can therefore only end up with a possible explanation about how the underlying challenges affect the implementation of welfare technology. In addition, the hypothesis must have some interaction with reality, but it will not be rejected if there are examples of other municipalities that have behaved differently (Jespersen, 2009: pp. 160-161).

Therefore, the research can be viewed as contextual, as it is based on the implementation in the municipality of Copenhagen. In this light, the thesis should be considered as a critical tool for municipalities to apply of welfare technology in the field of Danish Elderly Care.

2.2 Empirical Data Collection

Generally, the thesis applies four types of data material that are: official documents, user surveys, participant observations and qualitative semi-structured interviews.

The official documents are mainly gathered from the Municipality of Copenhagen and the Department of Healthy Growth (Sund Vækst), and refer primarily to the implementation process of welfare technology in the municipality. In addition, the thesis also applies key KL documents regarding welfare technology derived from working in the organisation. These documents are mainly the Status Report 2016 (KL, 2016a), an initiative description of the three welfare technological solutions (2013d), as well as an information report (KL, 2013j) that identifies 90 challenges in the application of welfare technology. This report is based upon five evaluation reports

from the Foundation for Welfare Technology, as well as five Welfare Technological Network Meetings conducted in 2013 with the participation of more than 50 municipalities. It is further important to mention that a confidential non-appendix (KL, 2016k) to the 2016 Status Report has been applied in the thesis, in order to obtain an overview of the implementation in the municipality of Copenhagen. This appendix is based upon the various reporting from the Danish municipalities, and can only be accessed with the permission of KL.

The quantitative data entail two user surveys, the so-called BRUS-surveys, both conducted in 2015 by the Copenhagen Health and Care Administration (SUF) and Epinion. The first survey aims at examining the level of satisfaction with home care in Copenhagen based on interviews with 2.511 home care recipients. The second survey was conducted at 39 selected care centres with the participation of 1000 residents. Common to both surveys are questions regarding the recipients' satisfaction with welfare technology, which are used in the thesis to investigate the challenges in the implementation process. Moreover, the thesis applies quantitative data from Danish Statistics, which can be viewed in the appendix. In order to achieve an overview of the secondary data sources applied in the thesis, the main organisational reports are listed in the following table.

Table 5. Overview of Main Organisational Documents

Organisation	Title
KL	Status Report 2016: The Joint Municipal Program for the Dissemination of Welfare Technology (2016)
KL	Initiative Descriptions of The Four Focus Areas (2013)
KL	Mapping the Challenges of Applying Welfare Technology (2013)
SUF	The Copenhagen Municipality's Action Plan for Welfare Technology in the Social Field (2015)
SUF	BRUS Survey 2015 - Home Care (2015)
SUF	BRUS Survey 2015 - Care Centres (2015)

The aforementioned participant observations derive from two KL Network Meetings from 2015 with key municipal actors in the area of welfare technology. The first meeting was attended by 28 welfare-technology consultants from the Capital Region of Denmark - including the municipality of Copenhagen. The second meeting was conducted in Region Zealand with a total of 18 municipal participants. Both meetings entailed a knowledge-sharing workshop, where the consultants exchanged experiences with the implementation of the three solutions. In addition, several of the

municipalities touched upon the challenges in the implementation and monitoring of welfare technologies. The observations were all written down as a summary and are included in the appendix. In 2016, a Network Meeting for the municipalities was also organised by KL but without the participation of Copenhagen.

In order to examine the social innovativeness of welfare technology, an expert interview with Birgit Jæger was conducted. Jæger is a professor in Science, Technology and Society at Roskilde University with a specialisation in Public Innovation and Technology. Furthermore she has published several articles on welfare technology, which makes her an ideal interview person. In order to investigate the implementation in the Municipality of Copenhagen, two semi-structured interviews were carried out with the project leader from Healthy Growth; Ivar Emil Boycott Havsteen-Mikkelsen and Gitte Duelund Jensen, director in KL's Department for Welfare Technology. All interviewees were given an interview guide that was sent out three days in advance. It is important to note that the interviews were all carried out in Danish in the interest of the respondents. The interviews were then transcribed into English and sent for approval to the respondents, in order to ensure good academic practice. The interviews are also submitted as audio files, and key quotes and points are included in the thesis with their specific time indicators. In order to achieve an overview of the primary empirical data applied in the thesis, the various activities are listed underneath:

Table 6. Overview of Primary Empirical Data Activities

Interview	Title
Semi-structured interview with Birgit Jæger	Professor in Science, Technology and Society, Roskilde University
Semi-structured interview with Gitte Duelund Jensen	Centre Director at KL's Centre for Welfare Technology
Semi-structured interview with Ivar Emil Boycott Havsteen-Mikkelsen	Project Leader in Healthy Growth
Observation study of Network Meeting in the Capital Region of Denmark.	Attended by 36 welfare-technology consultants from municipalities in Capital Region of Denmark
Observation study of Network Meeting in the Region Zealand of Denmark.	Attended by 28 welfare-technology consultants from municipalities in Region Zealand

2.3 Case Study Method

As mentioned, the purpose of the research is partially to interpret welfare technology within a social innovation perspective, as well as to investigate critically the underlying challenges that affect the implementation process in the municipality of Copenhagen.

Therefore, the research applies two types of case study designs in the analysis. According to the highly acclaimed professor in case study research; Richard K. Yin, a case study can generally be considered to be an empirical inquiry that studies a modern phenomenon by various sources of data (Yin, 2009: pp. 9). A case study is, thus, a suitable research method to obtain a full, detailed picture of a complex phenomenon such as welfare technology.

Within case study research there exist several types with different approaches. First of all, when a case study is connected within a certain discipline, it can be named to reflect that discipline e.g. a business case study, a historical case study etc. (Laws & McLeod, 2006: pp. 5). Since this thesis is built upon the theoretical framework of social innovation, the first part of the analysis can be defined as a social innovation case study of welfare technology. Another way of categorising case studies can be by dividing them up - either as descriptive, interpretive, exploratory or explanatory (ibid, 2006: pp. 5). As the first part of the analysis is to interpret welfare technology within social innovation, it can be argued that the thesis applies the interpretive case study. However, this case study design is not considered as adequate enough in relation to the subject field. Thus, a critical dimension is applied by investigating the implementation process in the municipality of Copenhagen. In addition, there is an assumption that there are underlying challenges in the implementation of welfare technology. It is, therefore, of interest to uncover these underlying challenges, in order critically to explain how they affect the implementation process. Thus, an explanatory case study design is also applied.

Moreover, according to Yin; a case study design can further be defined - either as a single case study or a multiple case study (Yin, 2009: pp. 46). In addition, these can be classified either as embedded or holistic case studies, depending if there are any sub-units of analysis (ibid, 2009: pp. 47-48). The second part of the thesis is based upon the embedded single case study approach, as it investigates how the municipality of Copenhagen has implemented the three solutions, as well as the main challenges that affect the implementation of welfare technology. As mentioned, the multiple case study design could have been preferred, since it allows the researcher to examine the assumptions more thoroughly. However, this type requires major resources and time, which I as a single-thesis student do not possess.

2.4 Reliability, Validity and Generalizability

The traditional requirements for scientific knowledge consist of the principles of *validity, generalizability* and *reliability* that together constitute a trinity. These principles are inherent, particularly in the field of natural science and have in recent years been transferred to the field of social science. However, as professor Steiner Kvale argues, it is difficult to transfer the concepts and therefore a certain transliteration has to be made (Kvale, 2009: pp. 225-227).

The concept of reliability entails that a research study must be repeated and that the same results have to be achieved before this requirement is met. However, this is difficult to achieve since qualitative studies are built upon a certain degree of subjectivity. In addition, philosophical hermeneutics do not work with the criteria of reliability since researchers do not have the same prejudices and horizons of understanding (Fredslund, 2012: pp. 96). Instead, reliability in social science research can be viewed as it is bound to the transparency of data. It is, therefore, essential that a researcher explains what data he or she will apply in a research study, and furthermore how the data have been obtained (Kvale, 2009: pp. 170-171). This requirement has been acknowledged in the thesis and can be viewed in Table 5 and Table 6 that provide an overview of the main primary and secondary data that has been applied in the research. Additionally, the reliability of a study can, arguably, be strengthened by involving more researchers in the research process (Thagaard, 2004: pp. 186). Due to the fact that I have written alone, this degree of reliability cannot be achieved. However, I have continuously discussed the empirical results with both the interviewees, Gitte Duelund Jensen and Ivar Boycott Havsteen-Mikkelsen. Moreover, I have on an on-going basis, discussed the research process and the conclusions with my supervisor; Villy J. Rasmussen, certain colleagues and fellow students. Thus, the degree of reliability in this thesis is relatively high.

The concept of validity is closely associated with the documentation and interpretation of data. When assessing the validity of a study in qualitative research one needs to pay attention to whether the applied data methods and sources can be considered reliable and valid (Kvale 2009: pp. 246). In addition, philosophical hermeneutics work with two quality demands in order to determine the validity of a research. The first demand is the requirement that the researcher expresses the prior understanding of the subject field (Fredslund, 2012: pp. 96). This requirement has been acknowledged in the thesis and can be viewed in Table 3, which is an overview of the prejudices in the subject field. The second demand is that the researcher explains

and justify for each step in the research process (Fredslund, 2012: pp. 96-97). This demand has also been applied in the thesis with the hermeneutical circle, which illustrates the process of interpreting the field of welfare technology from the framework of social innovation. Thus, I consider that the first part of the thesis accommodates the requirement of validity.

As mentioned, critical realism is basically a critique of positivism and the natural science measurement techniques. This means that the principle of validity cannot be measured and weighed in the same way, since the social structures are constantly changing and are part of an open system (Jespersen, 2009: pp. 148). Instead, validity in critical realism can be argued, as it is based on a criterion that it is important to have an informed and coherent line of reasoning. Thus, it is important to highlight that the conducted research deals with reality and practical life (ibid, 2009: pp. 150).

As mentioned, the second part of the thesis is built upon a critical case study that investigates how the municipality of Copenhagen has applied the three welfare technological solutions in their Elderly Care. The focus in the case study is analytically to identify the main challenges in the implementation, which is partially based on the collected empirical data and partially on the Information Report from KL (2013j). As, it is a fact that the municipality applies the three solutions in their Elderly Care; it can be argued that the research is in line with reality and that the thesis therefore lives up to criterion of validity. As mentioned, a requirement of critical realism is the notion of retroduction. Thus, it can be argued that the case study first applies an induction of the collected data, followed by the hypothetical deduction, to generate possible causes of the challenges in the application.

When conducting a single case study it is fundamental for the researcher to be conscious of the use of data sources. This is due to the fact that the single case study design has often been criticised for lack of data sources, which makes it difficult to generate solid knowledge (Flyvbjerg, 2006: pp. 1). One of the key researchers within case studies; Jacob D. Rendtorff stresses the point that a case study should be developed upon several and diverse data sources and methods, since it increases the reliability and validity of the results (Rendtorff, 2007: pp. 247-248). According to Yin, there are six possible sources of data in connection with a single case study; documents, archival records, interviews, direct observations, participant-observations and physical artefacts (Yin, 2009: pp. 99). The thesis uses five out of the six possible data sources by applying the three semi-structured interviews, quantitative data from the BRUS-surveys, statistical data from Danish Statistics and various organisational documents,

as well as participant-observations from the Network meetings. Thus, the case study approach seems to be in line with Rendtorff's requirements of various data material (ibid, 2002: pp. 248). Moreover, the research also applies annual reporting from the municipality of Copenhagen and thus the results generated can, arguably, be considered as valid.

On the other hand, external validity is bound to the concept of generalizability. Generalizability refers to whether a certain research study can conclude something general or universal about the studied phenomenon. Generalizability is often distinguished in three different types 1) naturalistic generalization, which is based on personal experiences; 2) statistical generalization, where there focus is on large amounts of data, and 3) analytical generalization that involves a detailed assessment of the extent to which the results of a study may be indicative of what can take place in a different situation (Kvale, 2009: pp. 228). The aim of this thesis is to make an analytical generalization whose conclusion about concrete challenges in the municipality of Copenhagen may be helpful for other municipalities in their application of the three solutions and welfare technologies in general. In addition, a case study will typically generate context-specific knowledge, since it can be difficult to create new validated theories based upon a case study design (Rendtorff, 2007: pp. 249). The knowledge derived from this thesis can, due to the setting of the municipality of Copenhagen and the use of a case study design, be considered to be contextual. This means that if the focus had been on another municipality and its application of welfare technology, then the thesis might have generated different results.

However, Copenhagen is viewed by many as a pioneer municipality and several municipalities follow their actions within the area of welfare technology. Furthermore, the investigation is based upon the KL-report that has been conducted with the participation of more than 50 municipalities. Moreover, the main challenges in the implementation process have been illustrated both in the interview with Ivar Havsteen-Mikkelsen and in the interview with Gitte Duelund Jensen. Therefore, the challenges are, arguably, not only inherent in the municipality of Copenhagen, but in the application of welfare technology in general. The results from this thesis can, thus, be viewed as providing a realistic picture of the challenges that arise when applying welfare technology.

3.0 Theoretical Considerations

The following is a brief introduction to the theoretical content, which will, initially place emphasis on defining the landscape of welfare technology based on various definitions and specific traits. The theories within public- and social innovation will be drawn upon, in order to be able to analyse welfare technology from a social innovation perspective.

3.1 Defining Technology and Welfare Technology

The notion of technology originates from the Greek term: "*techne*", meaning a collection of techniques, skills, methods and processes. Originally, the human species began using technology with the conversion of natural resources into simple tools (Tabachnick, 2007: pp. 90). During the Technological Revolution (1870-1920), the importance and significance of technology grew immensely, particularly due to large advancements in manufacturing and production systems. Since then, technology has become more advanced and is now established as a key factor in people's everyday lives. Nowadays, we live in a so-called information society where the leading role has been given to new technologies, especially those devoted to information (Sitek, 2014: pp. 1). However modern technology has not only revolutionised our way of communicating but has also significantly improved our health and life-quality.

Some years ago, technology in the Danish healthcare system was commonly associated with administrative IT, where it was used for control, documentation and planning (Technological Institute, 2013c). However, in the late 1990s a new term; *Welfare Technology* emerged in several Scandinavian countries, to define new user-driven technologies that directly improved welfare and health for the user (Kallesøe & Pedersen, 2012: pp. 8). Over the years, the term has received increased political interest and culminated in 2014 with the Municipal Finance Management Act between the former Danish Government, the Danish Municipalities and KL. Here, it has been agreed that welfare technology must be part of the delivery of public services, and a national dissemination strategy of welfare technological solutions has been promoted. In the strategy, it was decided that the effort should emphasise upon four selected focus areas, which are listed below.

Table 7. The Four Municipal Focus Areas of Welfare Technology

- Electronic Bidet Toilets ***[Vasketoiletter]***
- Safe Transfer Technologies – from 2 - 1 ***[Forflytningsteknologier - fra 2-1]***
- Eating Devices ***[Spiserobotter]***
- Better Use of Technical Aids ***[Bedre Brug af Hjælpemidler]***

(KL, 2015l)

From these focus areas, three different welfare technological solutions can be identified; "*Electronic Bidet Toilets", "Lifting Technologies" and "Eating Devices"*. Due to the fact that "*Better Use of Technical Aids*" initiatives do not represent a specific solution, initiatives in this area have not been included in the thesis. The overall vision of the strategy is to increase citizens' self-reliance and encourage efficiency at work for staff in elderly care. Furthermore, the dissemination in the four areas is considered to unleash overall net gains of at least 500 million DKK in the municipalities when fully phased in 2017 (The Municipal Finance Management Act: 2014: pp. 16). The 2016 Status Report from KL concludes that the four focus areas have been implemented in 87 municipalities and have had net gains of around 434 million DKK (KL, 2016a: pp. 2). Despite the increased political attention, welfare technology can still be argued as inadequately conceptualised. Nowadays, there are several descriptions of what can be called welfare technology and there is still no common Danish definition of what the term covers. The following two definitions are drawn upon from the municipalities of Frederica and Copenhagen, in order to illustrate the divergent understandings of the concept.

Table 8. Two Definitions of Welfare Technology

Welfare Technology; *are technologies that assist citizens by supporting safety, security, chores and mobility in the daily movements in and outside the home. It is also technologies that support the employee's tasks in cooperation with citizens.*	The Municipality of Fredericia
Welfare Technology; *means technologies that restore or expand the living conditions of citizens who need support in their everyday life.*	SUF, The Municipality of Copenhagen

KL, 2015m: Summary of 2015 Welfare Technological Network Meetings [Translation]

Common to both definitions is the lack of involvement of the public sector and the absence of welfare technology as an effective provision of service. In order to move closer to a concrete definition, one can compare it with other definitions for technologies in the area of healthcare. For instance, it can be argued that the term is closely linked to the English phenomenon of Ambient Assisted Living (AAL). But whereas AAL emphasises solely on "*addressing the needs of the aging population*" welfare technology addresses not only the elderly, but also other users of public services i.e. drug abusers, disabled etc. (Dingli & Seychell, 2015: pp. 93). Despite, the political focus of reducing healthcare costs; Welfare Technology can also be viewed as distinguishable from labour-saving technologies that place emphasis solely upon savings and liberation of labour resources.

A distinction further exists between personal aids and welfare technologies. The definition of aids is described in the Service Act under §112, as "a technical or personal aid" - for instance a walker. On the other hand, a welfare technology is typically a more advanced aid. Sometimes municipalities have even distinguished it by technologies that could be powered by electricity (Havsteen-Mikkelsen, 00:15:25 - 00:15:30). In order to define the concept more closely, the thesis uses the following definition of welfare technology. The definition has been developed throughout the thesis, in line with the hermeneutical circle.

Table 9. The Applied Definition of Welfare Technology
'New technological aids that assist users in their daily lives and optimally improve working conditions for employees, and at the same time ensure a more efficient provision of public sector services'.

Despite the positive incentives, the application of welfare technology has also been the subject of severe criticism. Firstly, there arise a number of ethical issues related to the increasing involvement of welfare technology, including concerns about the balance between so-called "warm hands" (the staff) and cold technology. When the Danish labour union FOA launched a campaign in 2010 entitled '*Real Care Requires Real People*", it was illustrated with a series of photos where nurses were replaced with robots. The campaign created an outrage among citizens and employees by drawing a picture of technologies as the cause of de-humanising of care and increased unemployment (Hoff, 2011: pp. 28-29).

Professor Bent Greve argues that, historically, the consequences of the introduction of new technology have always been a subject of concern. How will it, for example, eliminate jobs, create alienation and diminish human contact (Greve, 2011: pp. 5)? It is hard to disagree with the fact that it is unethical to fire employees and replace humans with robots since some elderly people heavily depend on social relations from their caregivers. Therefore, the question is more to find out when and how health care assistants can be supported by technology rather than replaced. Many elderly citizens will, for instance, prefer to use a Electronic Bidet Toilet, because they feel embarrassed about having their privacy invaded by the staff when toileting (Hoff, 2011: pp. 29-30). Thus the question is not, whether technology can and should replace human contact, but rather how technology can assist in addressing the needs of citizens and how it can complement the professional competence of employees (ibid, 2011: pp. 30-31).

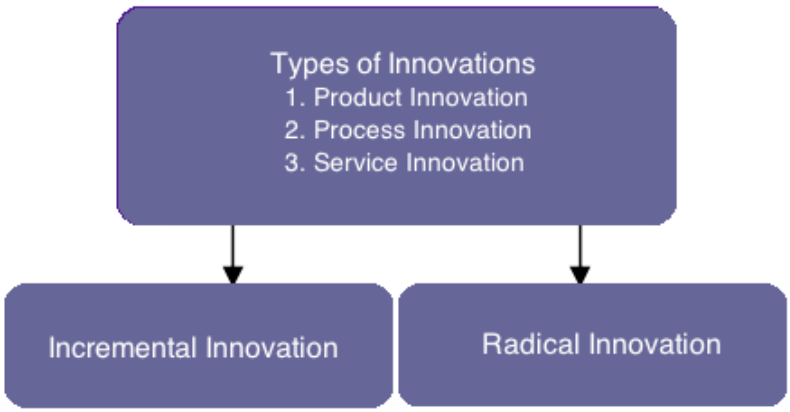
3.2 Defining Innovation in the Public Sector

As a research concept, the notion of innovation was first coined by the Austrian economist; Joseph A. Schumpeter, who used the term to describe society's economic development during the end of the 19th century (Jæger, 2011: pp. 170). Schumpeter developed the concept based on studies of private companies and how they achieved economic growth. Innovation in this context, was defined by; "*new combinations of familiar and new knowledge that companies use to develop new products or processes, and thereby open up new markets and ultimately create economic growt*h" (Jæger, 2011: pp. 170). Originally, Schumpeter distinguished sharply between the two concepts of inventions and innovations. 'Invention' is the creation of new scientific knowledge, while 'innovation' means that the invention is put into practice. This distinction has led to the perception of innovation as a linear process where new scientific findings are developed into new technologies and products (ibid, 2011: pp. 171). However, Schumpeter's linear understanding of innovation has, in the last decade, received severe criticism for its simplicity and for not involving the user as an active co-creator in the innovation process. In light of this critique, Schumpeter's approach has been rejected as an explanatory model for innovation (Kline & Rosenberg: pp. 1). Nowadays, the understanding of the term has changed drastically and there exist several branches with divergent focuses.

Despite this, the most common definition distinguishes it, in matters of product, process and service innovations (Sørensen & Torfing, 2011: pp. 29). While product innovation refers to the creation of new specific products, process innovation on the other hand refers to new forms of production or methods, such as simplification of work processes or new ways of management. Lastly, service innovation refers to the innovation of new services (ibid, 2011: pp. 29-30). Another definition that has also gained a foothold in the classification of innovation; is the difference between incremental and radical innovation (Kristensen & Voxted, 2009: pp. 17). Incremental innovation usually covers minor innovations, where organisations apply existing technology, knowledge or products in a new way. Incremental innovation will rarely supersede existing solutions, as the focus is on the improvement of these.

On the other hand, radical innovation refers to innovations that entail extensive changes. These innovations often consist of new technologies, values and concepts that have not previously been applied (ibid. 2009: pp. 17-19). A radical innovation therefore often requires the acquisition of new skills. This type of innovation will often supersede existing solutions, since it is more efficient or cheaper than previous solutions. In order to illustrate the different types of innovations, the following figure has been developed:

Figure 3 - Types of Innovations



Author's own model

From a historical perspective, innovation has most often been perceived as being relevant only for the private sector, where it is recognised as a vital tool for developing and sustaining businesses and organisations (Kristensen & Voxted, 2009: pp. 18).

However, in recent years the notion of innovation has also received keen attention from the public sector. This does not mean that innovations have been absent in this sector, but they have not been articulated as specific innovations (ibid, 2009: pp. 18-19). In addition, the purpose of innovation is also distinctive in the two sectors. While private companies aim at creating financial success, the public sector on the hand aims at creating value and welfare for its citizens (ibid, 2009: pp. 13). In the thesis, public innovation is therefore defined on the basis of Kristensen & Voxted's (2009) definition, which is also widely used within municipal administration:

Table 10. Kristensen & Voxted's Definition on Public Innovation
"Public innovations are new ideas that when implemented creates value. They represent a break with past practice, and help to create value within the core areas of public institutions.
Kristensen & Voxted, 2009: pp. 27 [Translation]

From the above, it can be argued that a new idea or invention is not considered an innovation until the idea is transposed and creates value. It is not a requirement that the idea has to be brand-new before one can talk about innovation. However, it must be new within its context. In addition, it can be difficult to define what kind of value that can be created from the innovation, since the public sector does not work with a specific financial bottom line. Thus, professor Christian Bason has created four bottom lines, which can be used to measure the value derived from an innovation in the public sector:

Table 11. The Four Bottom Lines in Public Innovation

1. Increased productivity: *can be viewed in process innovations as a result of improvements in public processes, workflows, services and organisation.*
2. Improved services: *often associated with service innovations that create more choices for citizens and businesses or opportunities to customise a service to the individual.*
3. Improved results: *can be associated with product innovations, typically in relation to public tools. Public tools may be regulatories, services, laws, etc.*
4. Strengthened democracy: *initiatives that have led to increased user involvement in decision-making.*

Bason, 2007: pp. 55 [Translation]

From the above, it can be argued that an innovation in the public sector has to promote either efficiency, productivity, quality and/or democracy.

Over the past years, innovation has also gained much attention from the Danish public sector, which can be illustrated, in particular, by the 2008 Government Strategy for "*Strengthening Innovation in the Public Sector*", in which the vision of being one of the world's most innovative public sectors is formulated. In addition, the former Danish government stressed the importance of innovation in solving three key challenges that the public sector would face in the future.

The first challenge is associated with the issue of public spending. Over the last years, the Danish municipalities have been forced to cut significantly on the costs of public services. The government's tax freeze and the imposition of zero growth entail that public tasks have to be undertaken with lower costs without the loss of service quality (The Government, 2008: pp. 11). Without innovative solutions, it is argued that public spending will increase more in the future. Thus, the government view innovation as a key method of ensuring an improved and less costly option in welfare services.

The second challenge is related to the increasing demands and expectations of public services. This is mainly due to the fact that the wealth of Danish citizens has increased significantly over the past years, and, therefore, it is estimated that the citizens expect a higher quality of services (ibid, 2008: pp. 11). In addition, the Welfare State was established at a time when the Danish society was more coherent, which made it possible to create a so-called "*one-size fits all model*" for the citizens (Monday Morning, 2013). This mind-set entails that you place all citizens in the same box – and, therefore, it is also named box-mentality. The mind-set can still today be detected in several municipalities that provide citizens with the same services according to the "category" that they belong to (Politiken, 2015). It is, thus, considered that the

increased expectations will put heavy demands on the development of social services and health care in particular.

The third challenge is based on rapid demographic development, which predicts that the number of elderly will rise, resulting in a greater need for welfare services (The Government, 2008: pp. 10). In addition, the public sector has for several years experienced a recruitment issue, especially in the area of healthcare. Furthermore, the rivalry between the public and the private sector has, over the past years, greatly intensified, which may be due to higher expectations from citizens in relation to the quality of services. Therefore, the public sector is increasingly competing with private institutions for skilled employees, and the need to recruit makes it necessary to create innovative and attractive jobs (The Government, 2008: pp. 12). Despite the fact that the above challenges were articulated in 2008, they can still be considered as present in modern Danish society. These general challenges, therefore, raises questions as to how major social and welfare tasks such as education, health and elderly care will be solved in the future without increased public spending. Overall, it is argued that through innovation, the public sector can provide better jobs for employees, improve the quality of services for citizens, and address major societal challenges.

However, according to the two well-known researchers in public innovation, Eva Sørensen and Jacob Torfing, there are a number of unfavourable conditions for innovation within the public sector. First of all, the fact that there is no financial bottom line in public budgets makes it difficult to measure the immediate gain of the innovation (Sørensen & Torfing, 2011: pp. 26). Secondly, there are not the same economic incentives in the public sector to create innovation. In other words, there is no guaranteed reward for public managers and project staff for innovative ideas. On the contrary, public organisations might actually have to save more if they show the ability to save resources (ibid, 2011: pp. 26-27). The last major difference is the political nature of the public sector, which entails that ideology and political motives, can influence and limit the innovation process (ibid, 2011: pp. 27).

According to the Danish Technological Institute, innovation in the public sector has historically been used in a combination of three tools - listed underneath:

Table 12. Historical Tools for Innovation in the Public Sector

1. Increasing government revenue (e.g. tax increases, growth, more working hours per week)
2. Cuts (reduced service availability, reduction of the public workforce, etc.)
3. Efficiency (process optimisation, digitisation, etc.)

Danish Technological Institute, 2012b: pp. 3 [Translation]

However, many of the implemented initiatives in these areas have proved either inadequate or difficult to implement. Therefore, there is still an urgent and rapidly growing need for alternative ways to meet the aforementioned challenges (Danish Technological Institute, 2012b: pp. 3). Thus, the concept of social innovation can be a fourth road to the solution of the societal challenges.

3.3 Defining Social Innovation

Around the world the interest in social innovation is continuously growing due to the recognition of past failures with conventional innovation to tackle societal challenges. However, along with its increased popularity has come less certainty about what exactly can be characterised as social innovation and what its purpose should be. Similar to public innovation there has been many attempts to define the term. Some definitions are viewed as too specific, while others are so broad that they include examples, which are neither 'social' nor 'innovative'. This might be due to fact that the field of social innovation is highly practice-led, and that understandings and definitions have been developed through people doing things in a new way rather than conceptualising them in an academic way (Young Foundation, 2010a: pp. 13-14).

The origin of the term also has an unclear history, but the first use of it can be traced back to the end of the 1960's with the social uprisings in Europe, where it was applied as an umbrella term for the large societal changes initiated by student- and worker movements (Moulaert et.al, 2013: pp. 13). Over the past years considerable literature on social innovation has come into existence, recently culminating with Geoff Mulgan's; *"Social Innovation: What it is, why it matters and how it can be accelerated"* (Mulgan et al., 2007). From Mulgan's work a certain definition on social innovation can be drawn upon, which is shown underneath:

Table 13. Mulgan's Definition on Social Innovation

"Innovative activities that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social".
(Mulgan et al. 2007: pp. 8)

This definition deals with the core purpose of social innovations and their organisational anchoring. The innovative activities have to meet social needs and are carried out by organisations whose primary purpose is to create social value. However, this definition is too broad since it does not explain what an innovative activity is and implies that innovations take place in social organisations, which typically lie in the third sector.

In order to develop a more comprehensive picture of social innovation, the thesis applies the perspectives from Asceline Groot and Ben Dankbaar. The two professors have identified two major geographical perspectives based on the particular sector in which the social innovation takes place. Groot and Dankbaar argue that social innovation from a North American perspective is originally associated with initiatives in and by the public sector, while the European perspective, refers originally to private and third sector initiatives to solve and address specific issues and needs (Groot and Dankbaar, 2014: pp. 2) However, in recent years the European perspective has developed also to integrate the public sector in the field of social innovation. This can be acknowledged in particular in the published report from the Bureau of European Policy Advisers (BEPA). The BEPA report (2011) depicts another definition of social innovation, which is illustrated below:

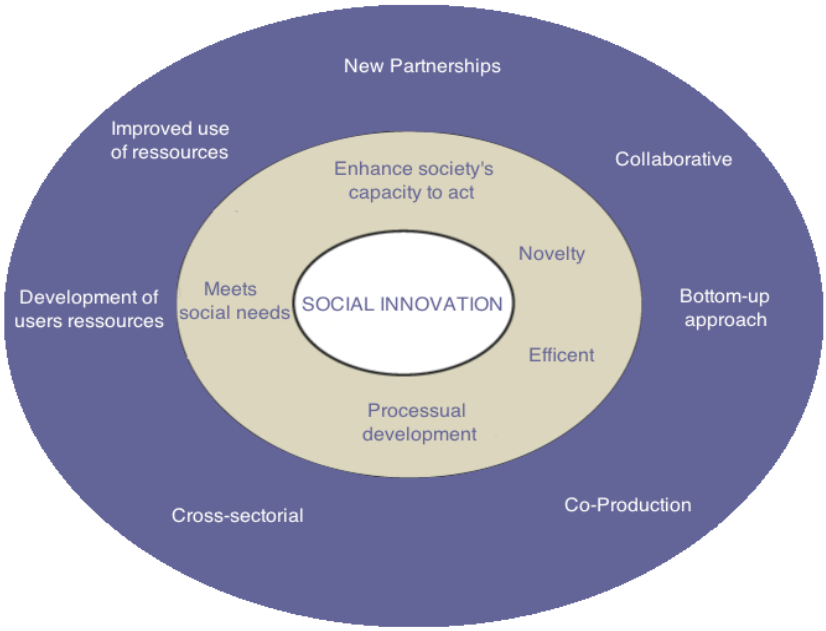
Table 14. The BEPA Definition on Social Innovation

"New ideas (products, services, organisational and business models etc.) that simultaneously meet social needs (more effectively than alternatives) while creating new social relationships and collaborations. They are innovations that are not only good for society but also enhance society's capacity to act"
(BEPA, 2011: pp. 31).

The thesis takes its focal point from this definition, since it encompasses three dimensions of social innovations by 1) new products or services that meet social needs, 2) new processes that create social relationships and collaborations, and 3) empowerment by enhancing society's capacity to act.

Another important work in the field of social innovation is the think-tank - The Young Foundation's; *"Defining Social Innovation"* (2012). This paper identifies a number of core elements and features of social innovation, which are illustrated as a figure on the next page.

Figure 4 – Core Features and Elements of Social Innovation



(Young Foundation, 2012b: pp. 18)

In order to enhance the reader's understanding of the elements and features, the figure is accompanied by a table with descriptions for each of them. The Young Foundation argues that some of the elements and features overlap quite closely and are interlinked (The Young Foundation, 2012b: pp. 17). This thesis takes the views that the products and services have to display a number of the following elements and features in order to be characterised as social innovations.

However, in line with The Young Foundation, it is not a requirement that the products and services have to meet all of them:

Table 15: The Core Elements and Features of Social Innovation

Core Elements	Description:
Novelty	*Social innovations must be new in the identified field.*
Effectiveness	*Social innovations must be more effective than existing solutions – thus entail a certain improvement.*
From ideas to implementation	*Social innovations must be realised, often through a development process.*
Social need	*It is a requirement that the innovation is based upon a specific social need of the user.*
Enhance society's capacity to act	*The users will be in a better position to take care of their social needs in the future.*

Common Features	Description:
Cross-sectorial	*Social innovation is often developed across sectors and professional areas.*
Collaborative	*Social innovation initiatives are often collaborative and include a wide spectrum of different actors.*
Bottom up approach	*The idea is often developed from the users - although usually with the support of the public system or companies.*
Co-production	*The gap between producers and consumers is sought to be erased. The process of social innovation therefore seeks to find a solution with rather than for citizens.*
Development of users resources	*The involved users develop resources that in the longer term enable them to increase their quality of life.*
Improved use of assets and resources	*Social innovation is often about utilising and coordinating the mobilization of both physical and human resources, which under normal circumstances would have been wasted.*
New partnerships	*Social innovations often develop new partnerships (between public organisations, companies and individuals, etc.)*
	(The Young Foundation, 2012: pp. 18-19) – remodelled by author

These core elements and features will later be used in order to analyse welfare technology from a social innovation perspective.

Another problematic issue in relation to the field of social innovation is the measuring of social impact derived from the innovations. A long lasting debate has taken place on how to measure social innovations most preferably, and whether it is even possible to measure the social outcomes. This is due to the fact that there are several differing ways of documenting social value. One way of measuring social innovations can be by applying the accounting tool of *The Triple Bottom Line Framework* (3BL) (Dainiené & Dagiliené, 2015: pp. 277). The 3BL Framework goes beyond the traditional measuring of business performance by incorporating the dimensions of social and environmental sustainability.

The concept was first coined in 1994 by the social entrepreneur John Elkington, who later defined the framework more fully in his publication; "*Cannibals With Forks: The Triple Bottom Line Of 21st Century Business"* (1997). Elkington's argument is that companies and organisations should measure their performance in three different bottom lines, instead of focusing solely on their financial performance (Elkington, 1997: pp. 1-2).

The first one is the traditional measurement of economic profit—the "bottom line" of the profit and loss account. This is often done in terms of profit, economic growth and cost savings. The second is the bottom line of a company's "social

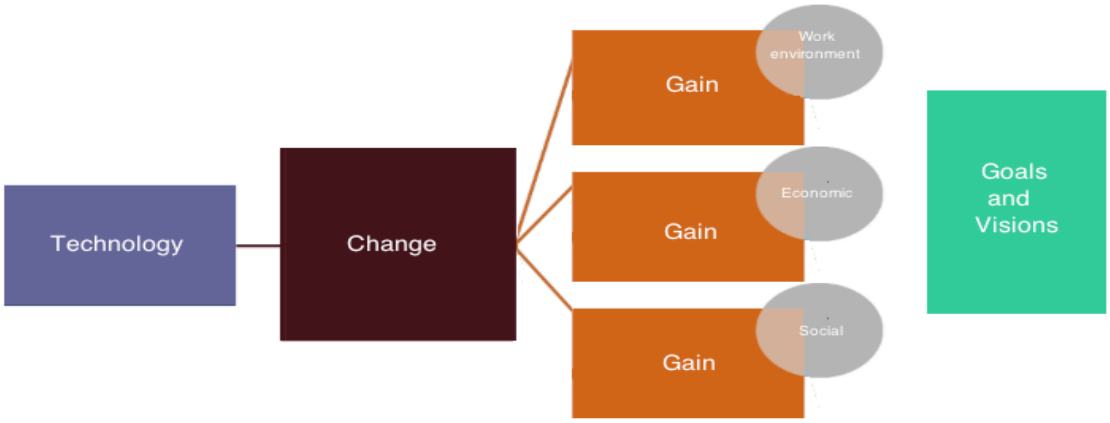
account"— that measures how socially responsible an organisation has been. This is typically based on whether the company or organisation improves the standard of living for the users and if it is based on equal opportunities. The third is the bottom line of the company's "environmental" account — an assessment of how environmentally responsible the company has been. This is often measured in terms of pollution prevention in the production or sustaining of natural resources (Rodriquez et.al, 2002: pp. 8-9). In recent years, the 3BL Framework has increasingly been applied in both for-profit, non-profit and government sectors, to measure the sustainability and the performance of new projects or policies. When applying the 3BL framework to the application of welfare technology, it becomes clear that the environmental dimension is not being assessed in relation to the implied stakeholders. Instead, it can be argued that the emphasis is on the staff in terms of improvements in their work environment. Thus, it has been necessary to replace the notion of the environmental dimension with that of the work environment in terms of workplace health and safety:

Table 16. Revised Triple Bottom Line Framework in relation to Welfare Technology

Social (User):	Work Environment (Staff):	Economic (Municipality):
□ Improving standard of living and self-reliance for the citizen.	□ Improving the physical working environment for staff.	□ Improving the efficiency of the task, resulting in cost savings on public healthcare.

A way of viewing the revised 3BL in relation to welfare technology can be by applying the model of a Value Tree, illustrated underneath:

Figure 5 - Value Tree Model



(KL, 2004e: pp. 3) Modified by author

A Value Tree is a well-researched method developed by KL that evaluates a certain technology in terms of the coherence of the positive changes it will bring, the gains it

will achieve, and the overall visions and goals that it can support (KL, 2004e: pp. 3). The model is often applied by municipalities in terms of developing business cases for the implementation of a specific technology, and is thus used in this thesis in order to assess the gains derived from the three welfare technological solutions.

3.4 Health Care in Copenhagen Municipality

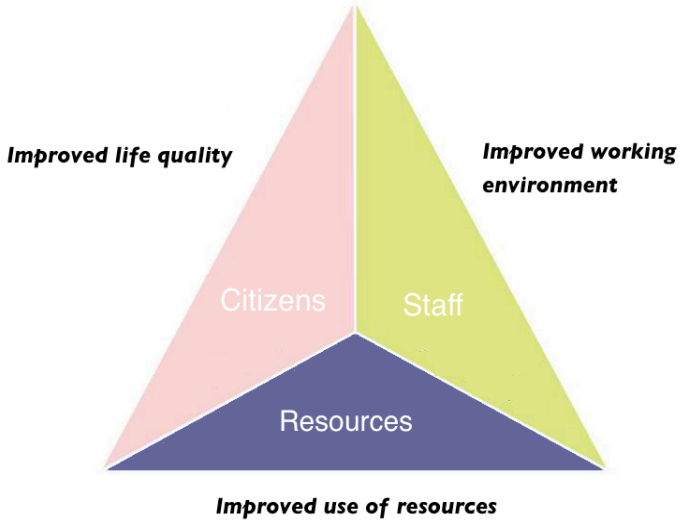
The following is a short presentation of Health Care in the municipality of Copenhagen, in order to be able to later analyse on the application of the three welfare technological solutions.

The Copenhagen Municipality is, with its 591.481 citizens, the largest and most populous of the Danish municipalities. It includes the central part of the country's capital and its area covers 86.4 square kilometres (Danish Statistics, 2016a). The overall municipal government is divided into seven administrative departments of which one is the Health and Care Department. This department is commonly referred to as SUF (Sundheds- og Omsorgsforvaltning), which is in charge of services for people over 65 in care centres and home care. In addition, the department encompasses around 10.000 employees, the largest professional groups being Social and Health Care (SOSU) aides, assistants and nurses (SUF, 2016). According to Danish Statistics there are around 5.000 of these employed in the municipal health care areas in Copenhagen.

While there are currently around 59.000 people over the age of 65 in the City of Copenhagen, it is expected that this number will rise to 72.000 in 2028. It is estimated that there are a total of around 15,000 of this age group currently receiving care services either at care centres or in home care ((Danish Statistics, 2015b), 2014c). Each year the municipality has net expenditures for around 75.000 DKK per elderly, making Copenhagen the municipality in Denmark, which spends the most on Elderly Care (Danish Statistics, 2014d). From 2011 to 2013, SUF intensified its purchasing of various welfare technological solutions in order to address the demographic challenges and to reduce health care costs (Havsteen-Mikkelsen, 00:46:49 - 00:47:15).

As mentioned, SUF works with welfare technology based on the above definition that primarily emphasises the citizen's need. In 2015 SUF published an ambitious plan; *the SUF-plan 2020* - for their work with welfare technology. The plan describes how the municipality selects welfare technological solutions based on an assessment of whether they can improve citizens' quality of life, working environment and efficiency. These three goals can therefore be viewed as the key factors in the implementation of welfare technological solutions in the municipality.

Figure 6 – SUF's Three Goals for Welfare Technology



(SUF, 2015a: pp. 7) Modified by author

SUF points out that the three goals are closely linked together and that a single goal cannot stand alone. In other words, the plan must not be viewed as an efficiency plan with a solely economic purpose (SUF, 2015a: pp. 7). As mentioned, welfare technological solutions are applied in several areas of health and care, but it is important to acknowledge that the SUF-plan is consistent for all areas.

4.0 Analysis

The following is the analytical content of the thesis, which has been divided into two parts. The first part is a social innovation analysis of Welfare Technology based upon the three welfare technological solutions, and the core process. The second part is a critical case study analysing challenges to the implementation of welfare technology in the municipality of Copenhagen

4.1 Welfare Technology within Social Innovation

As mentioned social innovations can be viewed both in relation to new products, services and processes that creates social and economic value for their stakeholders. The following will be an in-depth analysis of welfare technology based upon the three welfare technological solutions as socially innovative products/services, as well as the socially innovative elements and features of the process.

The method of Value Trees has been applied to each of the solutions in order to illustrate the socio-economic gains. As mentioned, the focus area of "*Better Use of*

Technical Aids" does not represent a specific solution and therefore initiatives in this area have not been included.

4.1.1 Welfare Technology as Socially Innovative Products

4.1.1.1 Electronic Bidet Toilets

Assisting elderly citizens with toileting is a physically demanding and time-consuming task for employees of care centres and in home care. The assistance is received up to 4-5 times daily and typically involves two working tasks for the employee: 1) assistance to and from the toilet and 2) the assistance of cleaning after toileting. It is estimated that there are around 19,000 citizens in care centres or in their own homes who receive such assistance for toileting. Despite the necessity of it, elderly citizens view the assistance as degrading and would rather prefer to handle their needs by themselves (KL, 2013d: pp. 3-4).

Electronic Bidet Toilets were originally invented in Japan in the 1980's as standard bidets, but have over time developed into a product that can make citizens with physical disabilities self-reliant in relation to toileting (Information, 2013). The Electronic Bidet Toilet is simply a toilet seat with a built-in rinsing and drying function that cleans with water and dries with air. The toilet seat is typically installed on top of the existing toilet and is operated by a remote control. There are several different suppliers on the Danish market each with its own model (KL, 2014f: pp. 25). The toilets are often combined with a toilet seat lifter that is a technical aid that enables citizens to get up and down from the toilet by themselves (ibid, 2014f: pp. 25). By applying the toilet seat lifter the citizens can therefore be completely self-reliant in relation to toileting since they are no longer dependent on assistance (KL, 2015b: pp. 17). Various observation studies have shown that citizens achieve greater independence in their daily life by being able to handle toilet visits by themselves. It is, therefore, expected that for some citizens a Electronic Bidet Toilet can replace assistance in their home or in care centres, whereas other citizens will continue to need assistance e.g. for buttoning pants etc. (KL, 2013d: pp. 3).

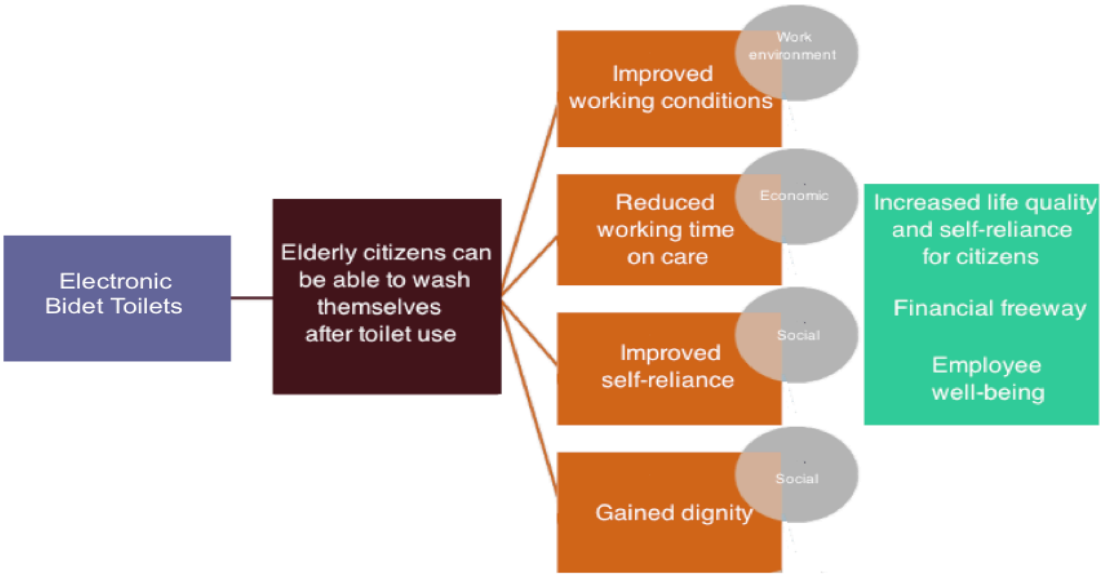
When asked, several citizens expressed that they were satisfied no longer to be dependent on others for help when toileting, and that the toilet has significantly increased their self-reliance and dignity (ibid, 2013d: pp. 4). It is also arguable that the toilets have created a more equal relationship between staff and the elderly citizens by avoiding very intimate situations. Experience also shows a number of benefits in health through improved hygiene, fewer urinary infections and fewer skin problems (The

National Board of Social Services, 2012: pp. 5-6). At the same time, the elimination of this task (helping with toilet visits) is beneficial for employees who avoid standing in stressful working positions (KL, 2015b: pp. 17). The technology furthermore entail that the working time of employees are prioritised better when visiting the elderly by not providing assistance in relation to toileting.

In this way it is expected that the increased use of Electronic Bidet Toilets can free up staff resources in the municipality. It is estimated that if a citizen is completely self-reliant through the toilet, there can also be achieved time savings of employee time in relation to transport to and from the citizen's home as well as fewer visits. This may for instance be about a total of 25 minutes, 1-4 times a day (The National Board Of Social Services, 2012: pp. 6-7).

In order to generate an overview of the socio-economic gains that can be achieved by the application of Electronic Bidet Toilets, a Value Tree for the technology has been illustrated underneath:

Figure 7 – Value Tree: Electronic Bidet Toilets



(KL, 2014h: pp. 5): Modified by author

As the above Value Tree illustrates, the application of Electronic Bidet Toilets entail various social gains for elderly citizens that rely on assistance for toileting. These gains are in the increased self-reliance and dignity of the user - as well as improved hygiene, that together result in an improved quality of life for the elderly citizen. The toilets also mean gains for the employees as they avoid damaging working positions. The economic gains are most notably in the elimination of unnecessary visits (including transportation) where the visit is solely for assistance in toileting.

In the 2016 Status Report from KL it is estimated that the introduction of Electronic Bidet Toilets in the Danish municipalities between 2014-2016 has resulted in an overall net gain of 104 million DKK (KL, 2015a: pp. 18). Since 2015 there has been reported an increased use of Electronic Bidet Toilets in Danish elderly care. It is estimated that the municipalities all together have purchased around 3.831 Electronic Bidet Toilets while 1.660 are currently in use. The significant growth in the number of purchased Electronic Bidet Toilets therefore indicates that more will be implemented in the future (ibid, 2016a: pp. 19).

4.1.1.2 Eating Devices:

Elderly citizens with severe functional limitations in their arms and hands often have difficulties when eating or cannot consume meals by themselves. These citizens receive assistance from staff to consume their daily meals. The assistance is typically received up to three times daily, where the elderly citizens are being 'fed' by a caregiver. However, many elderly citizens view that being fed by another human is degrading and damaging for their life-quality (Technological Institute, 2012: pp. 3-4). The technical solution of Eating Devices is designed for these elderly citizens to be completely or partially self-reliant when eating. In a Scandinavian context, the product of Eating Devices was invented by the Swedish senior citizen; Sten Hemmingsson who suffers from the deadly infectious disease of polio. Hemmingsson invented the product of *"Bestic"* to avoid being fed by his wife, which he considered to be degrading (Altinget, 2015).

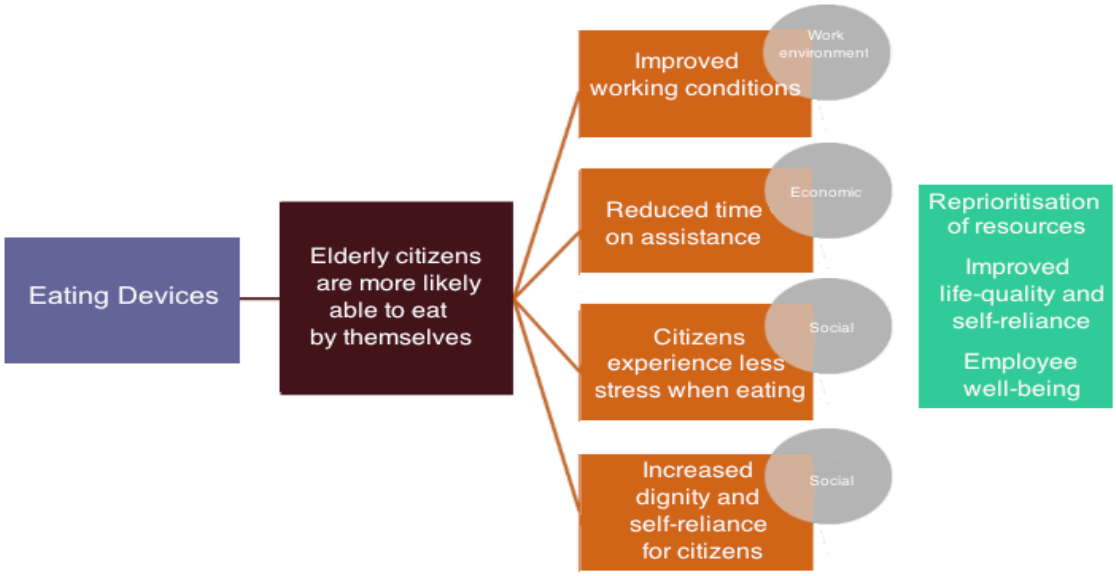
As with Electronic Bidet Toilets, there are several different models of Eating Devices but they all work from the same principle. The robot basically consists of an electric metal arm holding a spoon. The spoon then gathers the food from a turnable plate and brings it up to the citizen's mouth. The robot can be operated by either buttons or as an integral part of a joystick depending on the disability of the user (KL, 2014h: pp. 17). It is expected that the robots can increase the ability of citizens to eat on their own terms and not be dependent on assistance from staff at care centres or in home care. The Eating Devices can therefore give citizens a greater autonomy and satisfaction at being able to eat by themselves (ibid, 2014h: pp. 3). In several evaluations the elderly users have said that the robots have significantly increased their self-confidence and life quality, as they become more self-reliant by being able to eat by themselves.

Experiences have also shown that the use of Eating Devices can reduce the risk of suffocation, since citizens can be able to consume meals at their own pace

(Technological Institute, 2012: pp. 3-4). The robots have further created a more equal relationship between staff and the elderly citizens. In addition, it is also estimated that the robots can free up some of the employees' time, which can be used for other tasks while the citizen eat. However, employees are still required to serve the food and clean up after the meal. It is estimated that necessary assistance from the staff is reduced by nearly 17 minutes per meal per person resulting in an average daily working time saving of 108 DKK (Technological Institute, 2012: pp. 4).

In order to illustrate the socio-economic gains of Eating Devices, a Value Tree for the technology has been depicted below.

Figure 8 - Value Tree: Eating Devices



(KL, 2014j: pp. 5): Modified by author

As the above Value Tree displays, the application of Eating Devices entails various social gains for elderly citizens that are dependent on assistance when eating. The gains are mainly in relation to the increased dignity and self-reliance, which comes from the ability to be able to eat by themselves. This results in an improved quality of life for the elderly citizen. The robots also improve working conditions for employees, as they will have time to assist with tasks given a lower priority. As mentioned there are also significant economic gains which can be harvested, mainly in relation to the reduced time spent on assistance with eating. In the 2016 Status Report from KL it is estimated that the application of Eating Devices in the Danish municipalities between 2014-2016 has led to an overall net gain of 0.5 million DKK (KL, 2016a: pp. 5). There has also been an increased use of Eating Devices in the municipalities, although there are still relatively few examples. The number of municipalities that are implementing or have

implemented the Eating Devices has increased from 5 municipalities in 2015 to 18 municipalities in 2016 (ibid. 2016a: pp. 5-6).

4.1.1.3 Safe Transfer Technologies:

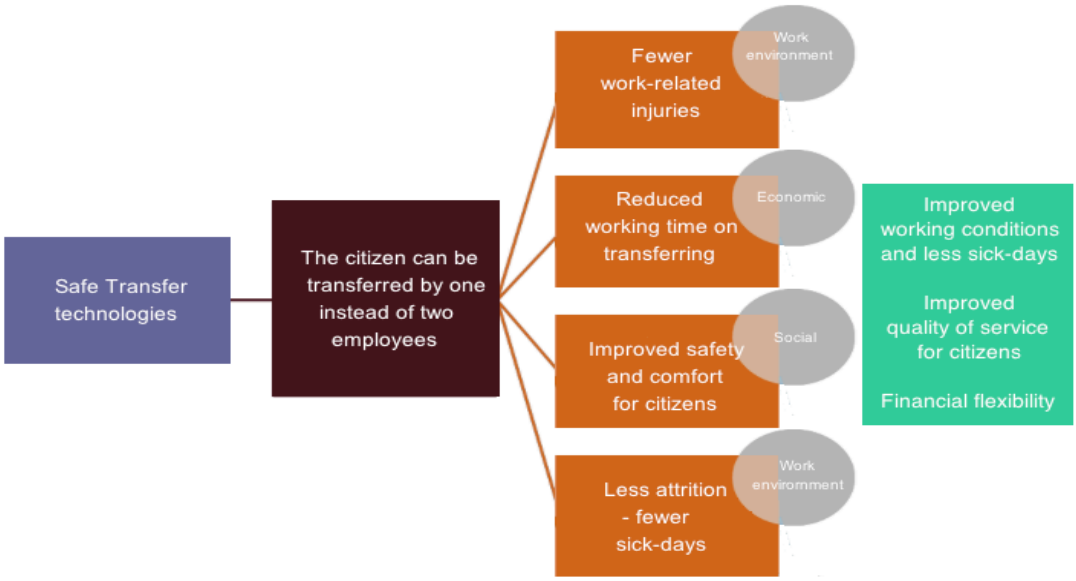
Citizens with disabilities that live in their own homes or in care centres often receive assistance to get out of bed, on the toilet or in the shower. The help in moving, or "transfer" of the citizen from one place to another is typically given by a carer who physically lifts the citizen. It is estimated that in Denmark alone there are more than 29 million transfers of citizens annually (PatientAtHome, 2015). In addition, it is one of the most damaging tasks for employees in terms of their own and the citizen's well-being. The heavy lifting can easily lead to physical damage to the carer and the task is time-consuming and often considered uncomfortable for the citizen (KL, 2013d: pp. 1). In addition, it is estimated that there are around 5.000 annually reported work-related injuries in elderly care alone (National Research Centre for the Working Environment, 2010). It is estimated that a majority of these derive from heavy lifting. Therefore several municipalities have a policy that there should be two employees for each transfer. However, the application of these policies is extremely costly and the use of two employees is often viewed as more stressful for the citizen (KL, 2013d: pp. 2).

The focus area of "*Safe Transfer Technologies*" covers a change of workflows where employees using transfer technologies can go from two to one employee in transfer situations. The transfer technologies include ceiling lifts and electric shower- and toilet chairs. A ceiling lift consists of a traversed system in the ceiling in which a motorized lift can operate. The ceiling lift makes the transfer situation faster and simpler. The lift comes with different types of sails that the citizen can sit / lie in during the transfer. However, the ceiling lift cannot be used in all spaces, typically not in the bathroom, so it is often accompanied by an electric shower- and toilet chair that can be driven to the bathroom (KL, 2014g: pp. 23). It is estimated that the application of these Safe Transfer Technologies can ensure a higher quality of service for the citizen, who will experience greater safety and comfort when he or she is transferred.

In various evaluation reports, citizens have expressed that they are very satisfied with the transfer technologies, since it entail that he or she will have more contact with the employee who makes the transfer. The transfer is also safer for the citizen, and is considered an improvement because, the transfer is based more on cooperation between the citizen and employee, rather than a heavy lift solely provided by the employee.

The ceiling lifts also improve the conditions for employees who avoid the heavy lifting (KL, 2013d: pp. 1). In addition, several employees say that they no longer experience pain in the hip, shoulder and neck after they started using the Ceiling Lifts. This entails fewer injuries for the staff and fewer sick-days. Moreover, the application also frees up employee resources that can be used more efficiently. In order to illustrate the socio-economic gains of Eating Devices, a Value Tree for the technology has been developed:

Figure 9 - Value Tree: Safe Transfer Technologies



(KL, 2014i: pp. 5): Modified by author

As the above Value Tree illustrates, the application of ceiling lifts can result in several social gains for the elderly citizens, mainly in relation to their increased safety and comfort, as well as improved relationships with staff. The lifts also entail certain social gains for the employees who will experience improved working conditions, since they will avoid the heavy lifting that will result in less injury and fewer sick-days. As mentioned, there are also significant economic gains that can be harvested, mainly as a result of less time spent on transferring as well as fewer work-related injuries.

In the 2016 Status Report from KL it is estimated that the application of Safe Transfer Technologies in the Danish municipalities between 2014-2016 has led to overall net gains of 265 million DKK (KL, 2016a: pp. 12). In addition, there has been reported an increased use of Ceiling Lifts in the municipalities with around 28.191 currently in use (ibid, 2016a: pp. 12).

4.1.2 Welfare Technology as a Social Innovation Process

As previously mentioned, a social innovation entails certain elements and features which will now lay the foundation for the following analysis of *Welfare Technology* as a process. First of all social innovations are often considered to be a *novelty* and must be new in a certain field As mentioned earlier, various types of technologies have been introduced in Danish healthcare over the years. However, the shift towards more user-driven technologies where the individual citizen is involved seems to represent a new way of providing welfare services. Therefore, it can be argued that welfare technologies are new in it is field, and thus live up to the core element of being a novelty.

A social innovation must also be more effective than existing services. As shown, welfare technological solutions are, arguably, more effective than the current services provided in the assistance of toileting, transferring and eating. In addition, the solutions improve the working conditions of staff, while providing the municipalities with ways of cutting costs in the provision of services. The solutions also improve elderly citizens' life-quality as they are in a better position to take care of themselves in the future. Thus, welfare technology seems to live up to the notion of enhancing a society's capacity to act.

Another of the core elements of social innovation is related to the requirement that the innovation is based upon a certain social need of the user and that the need is transformed into an idea and then a solution.

"[...] The solutions are typically generated from a beneficial idea from a company that has been developed on the basis of a specific need [...]" (Duelund, 00:22:39-00.22:43)

From the above statement, the process of welfare technology usually starts off with a private company designing a solution that addresses a certain social need such as a physical disability. A municipal department within healthcare then decides whether to purchase the solution based on an initial assessment of whether the product can address the social need of a certain target group/person and assist the municipal health care staff. The purchasing typically takes place by a public procurement process, since there are several companies on the market with the same solutions. The public procurement typically lies within the municipality's Purchasing Department. If a municipality decides on a solution then it will typically be delivered to the municipality's Auxiliary Service. The Auxiliary Service will then conduct an assessment on the user together with home care personnel or staff at care centres, based on whether the solution can address the need of its user and assist the staff. If it is considered that the solution can assist in the provision of healthcare services, the solution will then be implemented at the place where the elderly person lives (Duelund,

00:24:18 - 00:24:40). It is important to mention that the above is a basic description of how the process takes place and that the process can vary depending on the municipality where it is implemented. However, it can be considered that welfare technologies are generally developed on the basis of addressing a certain social need.

From the above description, it seems that the process of implementing welfare technology is not developed from a particularly bottom-up approach. As mentioned, the process typically starts off with an idea from a company developing into a product. However, the ideas can also be initiated on a citizen level, which was for instance the case with the Eating Devices that was invented by the Swedish senior citizen; Sten Hemmingsson. As Gitte Duelund Jensen describes in the below statement, Hemmingsson developed the robot in order to avoid the need to be fed by his wife, which he saw as degrading and damaging for his life quality:

> *"[...] Early in his illness phrase, he (red. Hemmingsson) acknowledges that; "In the long run I will not be able to eat by myself, and I would not put myself or my wife in a situation, where I am dependent on my wife to feed me – since I perceive this as very degrading for my life quality. (...)" Therefore I develop a solution that entail that I can still be able to eat by myself [...]* (Duelund (00:20:47 – 00:21:17)

As the above statement illustrates, the user with the disability can also develop a welfare technological solution. As mentioned a requirement for a social innovation can be argued, as it is to develop solutions *with* rather than *for* citizens. It is therefore important to involve the users as much as possible by erasing the gap between producers and consumers. In addition, Birgit Jæger expressed in the interview, that more and more municipalities are involving its citizens and healthcare staff in the implementation of new welfare technologies:

> *"[...] There is also the basic idea that the users play a significant larger role in the development of these technologies and that it is a prerequisite to involve the end-users in the initial process. And virtually – the sooner the better. In addition, there is also the mind-set that you should not just sit and wait for the private companies to develop the products, and that it is much more productive for all parties that the end-users are involved at an early stage [...]"*
> (Jæger, 00:24 50 – 00:25:20)

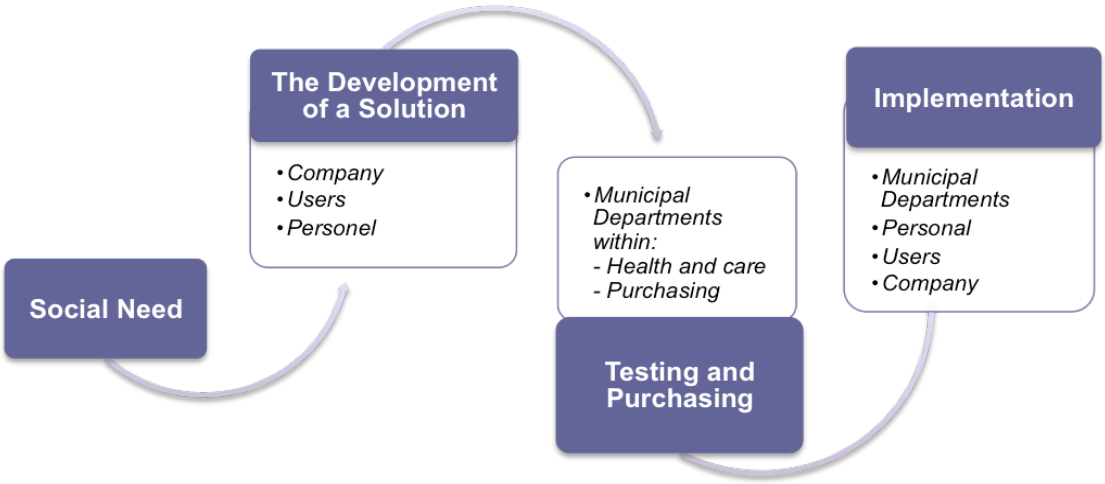
This mind-set can also be considered inherent in the municipality of Copenhagen, as they have implemented various initiatives to involve users and staff more in the initial phrases. This can be viewed, in particular by the establishments of *Living Lab Strandvejen* and the *Welfare Clinic,* which are platforms where citizens and staff can test new technologies and propose ideas for new welfare technological solutions:

> *"[...] We work in a way where we try to get citizens and employees involved in a lot of the work we do. For instance we have the so-called – Living Lab Strandvejen (...) In here, we have an apartment filled with different technologies that physiotherapists and citizens can test and try out (...) Then we also have the so-called Welfare Clinic that is a platform where citizens, companies and staff can propose new ideas [...]"*
> (Havsteen-Mikkelsen, 00:06:56 – 00:14.28)

From the above statement, it can be considered that the Municipality of Copenhagen attempts to involve the end-users, more in the initial process. There are at the moment around 200-300 project ideas for welfare technological solutions lying in *The Welfare Clinic* (ibid. 00:14.28-00:14.32). Thus, it can be considered that the process of welfare technology also entails the feature of co-production. Furthermore, it can be argued that the solutions may be developed from a bottom-up approach by the end-users with the support of companies and public actors. However, it can be considered that the solutions are usually developed by the companies – with the support of citizens, staff and public actors.

In order to obtain an overview of the process of welfare technology, the following figure has been developed:

Figure 10 – Overview of Welfare Technology as a Process



Author's own model

It is important to mention that the above, is simply an overview of the process and that the process of welfare technology should not be considered as a linear process, as Gitte Duelund argues:

> *"[...] A municipality also generally does not work with a linear process where they devour through all the phases [...]"* (Duelund: 00.39:24-00:39:28)

Thus, the process of welfare technology can be argued as it is in line with the notion that innovation is a constant process, in contrast to Schumpeter's linear process. From the above, it can be argued that the process of welfare technology involves plenty of different stakeholders. By including a wide spectrum of stakeholders, the process of welfare technology can therefore be considered as collaborative.

Furthermore, the process can also be seen as cross-sectorial as it is developed across sectors and professional areas. As mentioned, the private and public sector are

often viewed as competitive in the area of healthcare, since more and more citizens are increasingly selecting private home care or staying in private care centres. The implementation of welfare technology can therefore also seem to represent a paradigm shift towards more public-private collaboration. The process can also, arguably, develop new partnerships between public departments, companies and individuals.

As mentioned, innovations are typically defined either as *incremental* or *radical* innovations. From the previous descriptions, the application of welfare technology entails extensive changes in the area of healthcare - especially in the changes in tasks for staff and the experience of citizens. In addition, the implementation of welfare technology requires trainings and courses for staff to be accustomed to the technologies. Therefore welfare technology can seem to be in the scope of a radical innovation. This type of innovation often supersedes existing services, since it is more efficient or cheaper than previous solutions. This mind-set can also be viewed in relation to the solutions that supersede the assistance from staff in relation to toileting, eating and transferring.

4.2 Sub Conclusion:

The notion of welfare technology entails several of the core elements of a social innovation. First of all welfare technology addresses a certain social need by the creation of new products/services. The previous have illustrated how the three welfare technological solutions can address the social needs of elderly citizens in relation to the services of toileting, transferring and eating. It has furthermore been analysed what kind of social and economic value that can be derived from the solutions for the citizens, the staff and the municipality.

The application of welfare technology can overall be viewed as a radical social innovation as it has had a significant impact on healthcare in Denmark, and has revolutionised the way of delivering public services. The implementation of welfare technology also seems to live up to social innovative features, by involving several cross-sectorial stakeholders, creating new public-private partnerships and by involving the end-users in the development phases.

Thus, it can be considered that welfare technologies are usually developed *with* rather than only *for* the various users. As it has been illustrated, there is a strong potential for welfare technologies to accommodate the pressing issues in the Danish healthcare system, by improving the quality of services for citizens and the working conditions for health care staff, while also providing financial relief for the municipalities.

4.3 The Application of Welfare Technologies in the Elderly Care in Copenhagen Municipality

The following is an analysis of the implementation of the three solutions in the municipality of Copenhagen. This will be followed up by a critical investigation of the main challenges that arise from the application of welfare technology.

As mentioned, the Elderly Care in the municipality of Copenhagen is broadly organised through SUF – the Health and Care Administration. The welfare technological initiatives in this department are organised through a joint cooperation between three municipal entities lying within SUF. Firstly, we have the Housing Office (Boligkontoret), which is in charge of the modernisation, renovation and building of care centres. They are typically in charge of the fastened welfare technological solutions such as housing lifts, sensor floors etc. Secondly, there is the entity of Auxiliary Services, which is in charge of the distribution and maintenance of welfare technologies for citizens in both care centres and in home care. Lastly, the Department of Healthy Growth is mainly in charge of finding, testing and purchasing new welfare technologies (Havsteen-Mikkelsen, 2016: 00:05:18 - 00:06:30). Politicians are also of key importance for the application of welfare technology, since it is they who provide the funds for the purchasing. Public procurement is done jointly by SUF and the Social Services Department (SUF, 2013d).

As mentioned, the municipality has established various welfare technological platforms such as; *Living Lab Strandvejen* and the *Welfare Clinic*. These platforms can be viewed as crucial when the municipality implements new welfare technological solutions as they are being used as testing facilities. When the municipality tests the solutions, they do it by a so-called SCRATCH-method where they first test the technology in a 0.0 version. In this phase, the focus is on testing if the solution works and whether it is reasonable to test the solution with citizens. If the technology passes the test the municipality will then do a 0.1 test together with a small group of citizens and a number of health care staffs. If the technology again passes the test, it is then tested on a large-scale e.g. in home care or in care centres. Here, the solution is tested together with a larger group of citizens and employees (Havsteen-Mikkelsen, 00:08:20 – 00:08:44). The tests are all based upon the so-called VTV-model *(Welfare Technological Assessment Model)*, listed underneath (Healthy Growth, 2016**)**. The model has been developed in cooperation with the Danish Technological Institute, and assesses how a specific technology can be used, what kind of potential it has and how it can be implemented:

Figure 11 - Welfare Technological Assessment Model

Healthy Growth, 2016, remodelled by Author

As the above illustrates, the VTV-model consists of eight assessment parameters that are structured based upon four categories. The data from the parameters are based upon various analyses, studies, tests and trials of specific welfare technological solutions. Altogether the parameters will generate a systematic knowledge of the importance and impact of the technology in relation to a citizen-, organisational, technological- and economic level. The model can thereby create a reference point for the implementation of a certain technology.

The municipality has not yet developed a definitive Implementation Plan and therefore the practices generally vary depending on whether the technology is to be implemented in home care or at a care centre. The VTV-model is not only used as an analytical tool but is also applied in training courses for staff to get acquainted with the technologies.

> *"[...] At the moment we have around 120 health care assistants with VTV certificates. This entails that when we send out a new technology, e.g. to a health care assistant at a care centre, then the staff knows exactly how to use the technology and what to pay attention to [...]"* (Havsteen-Mikkelsen, 00.09:54-00:09:58)

Thus, the municipality is well aware of the importance of providing training courses for staff to equip them with new skills and knowledge. The municipality has also held various training days and information sessions for citizens and staff to get acquainted with the different technologies. The municipality is also attempting to increase the number of training courses by the establishment of a Welfare Technological Academy, which is to be completed in the upcoming summer (Havsteen-Mikkelsen, 00:12:44-00:12:45). In connection with KL's 2016 Status Report, the municipality of Copenhagen

reported how it has implemented the three welfare technological solutions in their Elderly Care. The numbers are listed underneath and display the total number of solutions that have been introduced and are in use from the 1st of January 2016 in both home care and in care centres. The numbers have not been published and derive from a non-appendix to the Status Report 2016.

Table 17. Overview of the Three Solutions in the Elderly Care in CPH Municipality

Type of Technology	In use	Not in use
Ceiling Lifts	2.638	0
Electronic Bidet Toilets	372	0
Eating Devices	0	5

(KL, 2016k)

The municipality has reported whether they have achieved any economic gains from the application and how the technologies have influenced their budgets. The numbers are given underneath and indicate the total financial savings that have been realised in 2015 and what the municipality expects to realise in 2016. In relation, to the area of Electronic Bidet Toilets then the municipality reported the overall realised gains from 2011-2015, listed underneath:

Table 18. Economic Gains from Three Solutions in the Elderly Care in CPH Municipality

Type of Technology	Realised in 2015	Expected in 2016
Ceiling Lifts	1.700.000 DKK	3.830.000 DKK
Electronic Bidet Toilets	6.000.000 DKK	-
Eating Devices	0 DKK	0 DKK

(KL, 2016k)

From the above, the municipality of Copenhagen has invested heavily in Ceiling Lifts. This may be due to the fact there are several socio-economic gains related to this technology:

"[...] In relation, to the economic gains then there is no doubt that Ceiling Lifts represent the largest economic potential [...]" (Duelund, 00:42:19-00:42:25)

Moreover, the municipality reports that 60 per cent of transferring situations are now carried out by one instead two employees, due to the increased use of Ceiling Lifts (KL, 2016k). Based upon the various positive experiences, the municipality is currently considering increasing the application of this technology.

"[...] We work a lot with Safe Transfer Technologies and Ceiling Lifts, and we have

currently send proposals to politicians regarding an increased use of these certain technologies […]" (Havsteen-Mikkelsen, 00:32:01-00:32:12)

As the municipality has harvested economic gains for 1.7 million DKK in 2015 and expects to secure further 3.8 million in 2016, the implementation has been successful within this focus area. The municipality has also invested significantly in the Electronic Bidet Toilets. However, the experiences with the use of this technology have been mixed.

"[…] Electronic Bidet Toilets is one of the areas where we have invested heavily in. But unfortunately it is also one of the cases that have proved inaccurate (…) Several of these Electronic Bidet Toilets have simply not been used, and have just been put in a corner […]"
(Havsteen-Mikkelsen, 00:27:22 - 00:33:00)

Despite the above statement, the municipality has still reported economic gains of around 6 million DKK from 2011 - 2015 (KL, 2016k). However, it is clear that the municipality has not succeeded well with the implementation of this technology - based on the fact that a significant number of these toilets are not being used. In relation, to the Eating Devices then there are currently none in use. This may be because:

"[…] The experiences are not especially positive. I have furthermore not experienced that other municipalities have implemented them with much success […]"
(Havsteen-Mikkelsen, 00:31:49 - 00:31:54)

A reason for the lack of implementation can also be argued as it is due to the fact that only a few municipalities implement the concrete Eating Devices. Instead they choose to implement other similar solutions - such as support arms that can compensate and assist in other situations than eating (Duelund, 00:47:18-00:47:28). In addition, it can be considered that the implementation in Copenhagen has primarily taken place in care centres, since there are not that many technologies suitable for citizens in home care (Havsteen-Mikkelsen, 00:25:36 - 00:25:40**)**. This is also based on the fact that citizens living in their own homes are often healthier and more functional than elderly citizens in care centres.

The 2015 BRUS Surveys illustrates that the elderly citizens in Copenhagen are highly satisfied with the introduction of welfare technologies in Elderly Care. 650 of the elderly respondents in the care centres replied that they use welfare technologies daily. From this, 507 responded that they experience that welfare technologies bring a positive difference in their everyday life (BRUS-Survey, 2015a: pp. 35).

As mentioned, Copenhagen is the municipality, which spends the most on Elderly Care. However, in the last five years the expenditure has decreased significantly from 95.231 DKK (in fixed prices) per person in 2010 to 75.156 DKK. per person in 2015 (Danish Statistics: 2015c). The substantial decrease can thus be considered; as it is may due to the introduction of the new welfare technological solutions. This is based

on the fact that the municipality intensified its application of welfare technology in their Elderly Care from 2011-2013. Thus, there is a strong potential for the municipality to further implement the welfare technological solutions in their provision of services for elderly.

However, the implementation of welfare technology also entails certain underlying challenges that affect the application. KL published in 2013 an information report regarding the challenges of implementing and applying welfare technology in practice. In here, 90 specific challenges were listed, which provide a framework for investigating the challenges in the context of Copenhagen. Thus, the following is a critical analysis based upon a number of the main challenges from the report in relation to the implementation in the Municipality of Copenhagen.

4.4 Main Challenges in Implementation of Welfare Technologies in the Copenhagen

The following is an investigation of the main challenges within the implementation of welfare technology in the municipality of Copenhagen. In order to structuralise the investigation, each challenge has been divided into a certain category.

a) Lack of Implementation Plans and Welfare Technologies as One Size-Fits All Solutions:

One of the main organizational challenges presented in the KL-report relates to the lack of guidelines for how the overall implementation process must be approached. This is because several municipalities do not develop a practical implementation plan when they invest in a solution. Basically, an implementation plan is a management tool that provides the municipality with a practical overview of what to do when implementing a solution: why and how to implement it, when should it be implemented and who are the main people responsible. The reason for the lack of implementation plans in the application of welfare technologies might be due to the fact that the public sector is commonly associated with the development of *one-size fits all solutions*.

In addition, a certain mind-set exist in some of the public departments, that; - "*if a certain solution has worked in one municipality, then it will also work in another*". As mentioned, there are various types of the specific solutions, but they all work from the same principles. Thus, it could be presumed that there would not be any difference whether the solutions are implemented in x, y or z municipality. However, the municipalities are nowadays more autonomous, which implies that they themselves

determines how the welfare tasks should be solved. The municipalities are structured in differing ways with individual departments, which implies that there can be major differences in the quality of services provided. As Gitte Duelund states, it is crucial for a municipality to be aware of the basis on which they implement welfare technology:

"[...] When an organisation purchase a welfare technology, then there is a challenge that the organisation may not have made it clear why and how they do it [...]"
(Duelund, 00:27:40-00:27:50)

In order to achieve a successful application, one cannot simply copy the implementation of a solution from another municipality. Yet there are still examples of municipalities that purchase a solution without a clear idea of why and how they should implement it. This was, for instance, the case with the implementation of Electronic Bidet Toilets in the Municipality of Copenhagen:

"[...] The municipality purchased several Electronic Bidet Toilets, and transferred them out to care centres and also some in home care. But they did not have a strategy for how to ensure the training and maintenance of the solution. Therefore several of these toilets have simply not been used, and have just been put in a corner [...]"
(Havsteen-Mikkelsen, 00:27:40-00:27:50)

Havsteen-Mikkelsen, even referred to a so-called *Welfare Technological Cowboy Age* that lasted from 2011-2013. In this period, several municipalities - including Copenhagen - hoarded the welfare technological solutions based on a few evaluations where the solutions were presented as miracle-cures. The municipalities therefore purchased the technologies without any in-depth knowledge, nor any plan for the implementation of the solutions:

"[...] This can especially be viewed in relation to our bad experiences with Electronic Bidet Toilets. These were mainly purchased in 2011, 2012 and 2013, at a Cowboy Age in which everything had to go as fast as possible [...]" (ibid: 00:46:54 - 00:47:11)

However, it can be argued that the municipalities - and especially the municipality of Copenhagen, have learned from these negative experiences, and are nowadays implementing the solutions in a more careful and systematic way:

"[...] The reason why we attempt to be very systematic when testing new solutions, is also based on the fact that we have a desire not to have anymore examples of failures - such as Electronic Bidet Toilets [...]" (Havsteen-Mikkelsen: 00:28:25 - 00:28:30)

Thus, there has been a growing understanding that welfare technological solutions cannot be viewed as one-size-fits all solutions, and that you have to carry out an individual studies in each municipality. As mentioned, the Copenhagen Municipality nowadays implements the welfare technological solutions based on the VTV-model, which gives a basis for an implementation plan. However, it can be considered that the

municipality is still lacking a specific implementation plan from which to implement the technologies.

b) Silo-Mentality and Lack of Organisational Changes:

Another organisational barrier derived from the KL-report is associated with the notion of silo-mentalities inherent in the different municipal departments (KL, 2013j: pp. 8). A silo-mentality is related to a certain mind-set where departments or sectors do not wish to share information with others in the same area.

As it has been illustrated, the implementation of welfare technology entails working across different administrations so a holistic view is difficult to achieve. In addition, there can be a lack of clear division of tasks between the different departments. Furthermore, each municipal department may have their own working procedures. The application of welfare technology therefore requires changes of working procedures in the various departments in order for the implementation to be successful. It can often be difficult to change these procedures since they are inherent in the organisation and thus entail major organisational changes. The challenge of working across departments can also be viewed in the municipality of Copenhagen, where the Department of Healthy Growth, the Auxiliary Services and the Housing Office all need to cooperate for same cause:

> *"[…] There may be several barriers when implementing welfare technologies, since certain persons in the organisation are accustomed to specific workflows […]"*
> (Havsteen-Mikkelsen, 00:37:38-00:37:43)

In addition, Havsteen-Mikkelsen stated that as of 1st of June 2016, Healthy Growth will be transferred from SUF to the Department of Digitalisation and Innovation. This transferal may pose a new challenge for future work with welfare technologies in the municipality, as the different municipal entities will no longer be in the same department.

The silo-mentality can also be detected between the different municipalities as they hesitate to share their knowledge and experiences with certain technologies. The main reason for this is that the municipalities are often competing internally for the good stories, as exemplified by the municipality of Copenhagen, which did not participate in KL's 2016 Network Meeting. It is crucial for the municipalities to knowledge-share as much as possible so that they can learn from each other and avoid negative experiences.

c) Costly and Resource-Intensive Implementation:

Despite the fact, that solutions - as previously illustrated - may entail significant economic potentials for the municipalities, it can also be argued that welfare technologies are expensive. For instance, the purchase cost of one Electronic Bidet Toilet is around 40.000 DKK (KL, 2014i: pp. 2). It is not only the purchase price that needs to be included when purchasing the toilet, but also costs related to the various installations of water and electricity. It is expected that a municipality uses a lot of time and resources to implement the solutions, for instance, in relation to the provision of training courses for staff. Thus, the welfare technological solutions are not only expensive to purchase, but also require outlay for implementation and maintenance.

Sometimes municipalities are not aware of these extra costs when they invest in a welfare technological solution. Thus, there may be a situation where there are no funds available for the implementation process, which will have a negative impact on the application. This was, for instance, the case with the implementation of Electronic Bidet Toilets in the municipality of Copenhagen, where the municipality did not ensure the training of staff and the maintenance of the toilets.

d) The Myths and Negative Stories:

In the KL report, it has been found that the notion of welfare technology is often clouded by myths and negative stories. These can be promulgated among employees, citizens and the general population, affecting the incentives for introducing welfare technologies As mentioned, one of the myths relates to the notion that if a municipality implements a welfare technology, it is because they have to save care personnel - e.g. fire employees. It is difficult to define whether this myth is actually true, but according to Gitte Duelund it is not:

> *"[...] We have never experienced that when a municipality has implemented welfare technologies they have also dismissed employees. There may be a single or two examples where it has been the case, but there has not been a causal relationship between the implementation of welfare technologies and the dismissal of employees [...]"*
>
> (Duelund, 00:32:52 - 00:33:14)

Moreover, there have not been reported any cases of firing employees when implementing the solutions in the municipality of Copenhagen (Havsteen-Mikkelsen, 00:45:33 - 00:45:44). Thus, it would seem that it is a myth that there is a correlation between the firing of staff and the introduction of welfare technology.

Another myth is that the application of welfare technology restructures Elderly Care so radically that the municipalities leave elderly people alone with the technologies and that citizens will no longer receive assistance from a caregiver. The

notion that the welfare technological solutions represent a de-humanisation of Elderly Care is also not based on reality. Conversely, in several cases, the solutions have significantly improved relationships between elderly citizens and the care staff. However, as mentioned, there are certain negative experiences related to the use of welfare technology in Elderly Care largely because of the inadequate implementation of Electronic Bidet Toilets in the municipality of Copenhagen:

> *"[…] These failures (red. with Electronic Bidet Toilets) also created severe headwind especially among our employees. If a care staff has just once had the experience that a technology has been coming in from the right, where they have not been involved or received trainings, then we will face much more resistance when we implement another technology […]"* (Havsteen-Mikkelsen, 00:28:33 - 00:28:49)

As the above statement illustrates, it is crucial for the municipality to involve the staff in the implementation phrase, in order to avoid these negative experiences.

The negative stories or rumours can also influence politicians and their views on the technologies. This may be the reason why there is often fluctuating political support, as politicians can be afraid to stand on the goal of welfare technology (KL, 2013: pp. 6). As mentioned, the politicians' views are to be of key importance since it is they who ultimately decide to invest in a solution. Thus, if a municipality experiences a lack of political support it can have a severely damaging effect for the further application of welfare technology.

However, in the case of the municipality of Copenhagen there is strong political support for the application of welfare technologies. This is because in 2015 the politicians earmarked 452 million DKK for the further implementation of welfare technologies (Berlingske, 2016b).

e) Lack of Technical Skills and Knowledge of the Solutions:

An additional challenge presented in the KL-report relates to the lack of technical competences in staff. As mentioned before, the health care staffs rely heavily on the municipality to provide the specific skills and technical knowledge, in order for a successful implementation to take place. With this in mind, the municipality of Copenhagen has provided VTV-courses for 120 staff members.

However, there are currently around 5.000 employed Health and Care aides, assistants and nurses in the municipality, a considerable number of whom are employed in Elderly Care. Therefore, the number of employees who have received training courses is relatively low compared with the total number of employed personnel. Thus, situations can occur where the technologies are transferred to a care centre, but where there are no employees with the required training to use it. In addition, employees do not often have insight into and knowledge of the technologies

available on the market (KL, 2013: pp. 11). It can be argued that this issue is also present in the municipality of Copenhagen:

"[...] The challenge is that sometimes the employees are not aware that these technologies exist [...]" (Havsteen Mikkelsen, 00:21:57 - 00:22:00)

The lack of knowledge means that it can be difficult for care staff to assess what kind of technologies would be suitable for elderly citizens creating a further obstacle in the way of the application of welfare technology in Copenhagen.

f) The Force of Habit and Lack of Involvement of Users:

Another key challenge in relation to the application of the solutions relates to the changed perception of care in the elderly and staff. As mentioned, welfare technologies entail new ways of working and a change of habits. Elderly citizens may be accustomed to a certain kind of care, but with the introduction of welfare technologies, the idea is that citizens will increasingly be able to handle the tasks themselves. It is estimated that for some citizens this can create insecurity, to the extent that they will refuse to use the new technologies (KL, 2013: pp. 13). This can also be true for staff, as they are also used to certain ways of working. Thus, there is a considerable challenge in terms of changing the "force of habit". This challenge can also be considered as present in the municipality of Copenhagen:

"[...] Despite the fact that employees and citizens say; "That this (red. the technology) is really great" and acknowledges the positive gains, they can still argue that they are satisfied with the old workflow [...]" (Havsteen-Mikkelsen, 00:37:27 - 00:37:33)

As shown earlier, the municipality of Copenhagen has installed around 372 Electronic Bidet Toilets in either home care or in care centres. However, as mentioned several of these are not being used and have simply been put in a corner:

"[...] We have several examples of Electronic Bidet Toilets that have been installed but are not used because citizens do not dare to use them [...]" (ibid, 00:30:44 - 00:30:49)

From the above, one can view that there is a significant challenge for the municipality to make citizens comfortable with the new solutions. The reason for this may be found in the lack of involvement of users. As mentioned, the municipality has implemented various initiatives to involve citizens in the initial phrases by testing the solutions together with them as well as arranging training days and information sessions.

In addition, the 2015 BRUS surveys conducted by the municipality illustrated that a large majority of the elderly citizens are highly satisfied with the welfare technological solutions. However, the surveys also identified that only a small percentage of the elderly respondents have actually talked with a caregiver about welfare technology. In the survey conducted at the 39 care centres only 230 out of the

1.000 elderly citizens respond that they have been in contact with care personnel or the municipality regarding the use of welfare technology (BRUS-Survey, 2015a). This clearly indicates a certain lack of involvement on the part of the users.

Thus, it can be argued that the municipality has involved other citizens in the initial phases, instead of the targeted elderly users.

4.5 Sub Conclusion:

As the above has illustrated, the application of the three welfare technological solutions has had various results in the context of the municipality of Copenhagen. It can be concluded that the implementation of Ceiling Lifts has been successful and that the technology is well received among citizens and employees. 60 per cent of all transferals are now carried out by one instead of two employees. The change in ways of working has, thereby, significantly reduced the costs of services in this area and it is estimated that the municipality will make net gains of 3.83 million DKK in 2016 from this technology.

However, it can also be concluded that there are certain problems in relation to the application of Eating Devices - and in particular the Electronic Bidet Toilets. This is, mainly due to the absence of specific implementation plans, as well as a lack of provision of training courses for care personnel and a lack of involvement of the elderly user. These factors can be viewed, particularly, in relation to the Electronic Bidet Toilets, where several of these have been transferred to care centres where employees did not understand how the technology functioned and simply left them in a corner unused. The implementation of Electronic Bidet Toilets further identified a certain lack of user-involvement, since several citizens were not comfortable using the toilets.

From the above, it can be concluded that the poor implementation of Electronic Bidet Toilets has led to the promulgation of certain negative stories, which has influenced some of the employees' and citizens' perceptions of welfare technology. It is therefore considered crucial for the municipality to establish new initiatives that can address the lack of training courses and involve the users more in the initial phrases.

5.0 Discussion of Analytical Results and the Future of Welfare Technology

The aim of this chapter is, first, to discuss the main analytical results and research contributions. Secondly, a discussion is brought up regarding the future landscape of welfare technology in Elderly Care in Denmark.

5.1 Main Results and Research Contributions:

The thesis was initiated by presenting a rather pessimistic picture of the situation in the Danish Elderly Care, as well as the perception of welfare technologies as miracle cures. However, it was also acknowledged that there exists a certain lack of knowledge about welfare technology in general, as there is no clear definition of the phenomenon. The thesis has, thus, contributed to the notional landscape of welfare technology by developing a more suitable definition that encompasses the different stakeholders - i.e. the user, the staff and the municipality. Moreover, the thesis is the first of its kind to investigate the three welfare technologies that are the most commonly used in Danish Elderly Care.

In addition, there seems to be a lack of understanding of the potential of welfare technologies to address the problems of an increased elderly burden and reduced public funds. Welfare technology has previously been perceived as user-driven, but the thesis suggests that a social innovation framework is more suitable in identifying the potentials of the three solutions. The empirical results correspond well with the theoretical framework of social innovation, firstly because the three welfare technological solutions are all based on addressing a user's specific social need, which is the most important element of a social innovation. Furthermore, it has been shown that welfare technologies can increase the quality of health services and the life quality of their users, as well as improving working conditions for staff and reducing public costs for municipalities. In addition, it is considered that welfare technologies are usually developed *with* rather than only *for* the various users. It can, thus, be considered that there is a natural correlation between welfare technology and social innovation. By applying the dimension of social innovation, the thesis has also offered a new take on how welfare technology generally can be perceived.

Moreover, the research takes a critical look at the practical implementation of welfare technology in the municipality of Copenhagen. The investigation identifies the main challenges in the implementation derived from KL's report on the issues of implementing and applying welfare technology in practice. While the municipality has

successfully implemented the Ceiling Lifts, there are certain challenges in connection with the application of Eating Devices and in particular, Electronic Bidet Toilets. The empirical results are generally consistent with the KL-report, as the main challenges to these solutions are an absence of specific implementation plans, as well as a lack of provision of training for care staff.

However, the municipality is currently working on addressing these issues by first developing an implementation model, named VTI (Welfare Technological Implementation) (Havsteen-Mikkelsen, 00:22:23-00:22:30). The municipality also recognises the lack of training and attempts to address this with the establishment of the Welfare Technological Academy, which is to be completed by the summer of 2016.

As the research has shown, it is vital for municipalities to implement the welfare technological solutions *with* rather than *for* the user, in order to secure a successful implementation. The municipality of Copenhagen has attempted to do this by conducting information sessions and involving citizens in the testing phrases. However, the BRUS-surveys identify a clear lack of user-involvement and thus it would seem that the municipality may have involved other citizens than the target users in the testing phases.

5.2 The Future of Welfare Technologies:

As mentioned, the three welfare technological solutions have been implemented in 87 municipalities and have had overall net gains of around 434 million DKK. Thus, the municipalities are on their way to secure the 500 million DKK agreed in the Strategy for the Dissemination of Welfare Technology. However, the dissemination of welfare technology will of course not end when the agreement expires. In 2017 it is expected that a new strategy will be launched for the dissemination of welfare technology in Danish municipalities. This strategy will replace the existing strategy that this thesis has been built upon. It is expected that the three welfare technological solutions will still be part of the strategy, but the focus will also be on new solutions.

This might be Sensor Floors, which are also considered to be a “mature” solution. This technology is currently being tested at care centres and in home care, and a few municipalities have already invested heavily in this new solution. However, the application of Sensor Floors also raises new questions in relation to the perception of welfare technology. Sensor Floors are intelligent floor-based sensor systems, which are able to detect the individual residents' movements on the floor. A Sensor Floor can for instance detect when a resident falls and will then inform the care staff about the accident by a text message. The floors can further detect if a citizen goes out of the

home, and are, therefore, especially useful for elderly citizens with dementia not capable to take care of themselves due to memory loss.

Usually, a carer conducts control visits at night to see if these residents are doing well, which entail that they often wake the residents from their sleep - causing a considerable irritation for the elderly. These visits are also very expensive as they are conducted by staff on a daily basis, which incurs large expenditures from public budgets. The Sensor Floors give residents more safety in their everyday life, while making the workday simpler for care staff and less costly for the municipality. However, the technology also raises certain legal issues especially in relation to citizens' privacy. Experiences has shown that some elderly citizens view the Sensor Floors as surveillance and that they are afraid of them:

> *"[...] The sensors could not detect her and therefore a staff was called in. The staff then found the lady in a closet, since she perceived the sensors as eyes that constantly looked at her, which frightened her [...]"* (Jæger, 00:19:50 - 00:20:03)

In addition, the degree of dementia can vary greatly and, therefore, there is exist a grey zone between citizens that suffer from severe dementia and those that have only minor memory loss but are still functional. There have been unnecessary emergency calls where a citizen with a low degree of dementia might just have gone for a walk. It is, therefore, extremely important that in each situation the citizen is individually assessed as to the degree of dementia before this technology is applied.

From the above, we can contest that the application of welfare technology raises an interesting debate about the fundamental nature of the public sector. What kind of core services should a municipality provide to its citizens and where should the line be drawn? It may be the case that Danish citizens have become too accustomed to a Welfare Society and have the perception that the public sector shall serve a citizen from their cradle to their grave. If one goes 50 years back the situation was completely different as the individual's family and relatives provided the main responsibility and care.

Another factor that may impact the future application of welfare technology in the Danish municipalities is of a political nature. In 2015 the Danish government launched a strategy called Reprioritisation Contribution (*Omprioriteringsbidrag*) that would move 2.4 billion DKK annually from 2016-2019 from the municipal welfare services directly into the state treasury. The Reprioritisation Contribution was agreed in the Municipal Finance Management Act 2016 but received severe criticism from municipalities and KL, since it was estimated that it would drastically affect the municipal budgets for health and elderly care. For instance, it was considered that the contribution would put 10.700 jobs at risk in the Danish municipalities where 5.500

would be within the area of elderly care (Politica, 2015). As mentioned, application of welfare technology requires large investments from municipalities and incurs costs related to purchasing, implementation and maintenance. Thus, it was expected that the Reprioritisation Contribution would have a significant impact on the area of welfare technology and become a barrier for municipalities who might hesitate to invest in the new solutions.

However, due to the heavy pressure from municipalities and KL, the Government agreed to abandon the contribution in the Municipal Finance Management Act for 2017. This implies that 2.2 billion out of the 2.4 billion from 2016 will be transferred back to the municipalities in 2017. The abolition of the Reprioritisation Contribution means that the municipalities now have increased financial flexibility, which might give the possibility to increase the introduction of welfare technologies.

However, at the bottom line, the funding for welfare will still be reduced by 200 million DKK in 2017 compared to that of 2016. Furthermore, the municipalities will still cut half a billion of their funding for welfare annually from 2018 and to 2020. As the Municipal Finance Management Act 2017 has just been signed, it is difficult to estimate how the agreement will influence the landscape of welfare technology. However, it is certain that the new agreement will not influence the application as drastically as first expected, due to the abolishment of the Reprioritisation Contribution. Thus, it can be concluded that welfare technologies will continue to be applied in the Danish healthcare system.

6.0 Further Research

The following are suggestions for further research that has arisen by studying the application of welfare technologies in Elderly Care in Denmark.

There are several possible ways to view the outcome of the thesis and to speculate on where further research could go. By investigating the application of the three welfare technological solutions in the municipality of Copenhagen and welfare technology in general, several interesting perspectives have emerged which could be intriguing to investigate more closely.

As it has been shown, there is an absence of implementation planning for the application of welfare technology in Copenhagen. But, as mentioned, the municipality is currently trying to develop an implementation model. Thus, it could be exciting to

investigate how this model might look and how it can address the lack of clear division of tasks. The municipality has also attempted to address the issue of the lack of training by establishing the Welfare Technological Academy. As mentioned, the academy is to be launched later this summer, and it could be of interest to examine the effect that this would have on the introduction and use of welfare technology in the municipality. Moreover, the thesis has also pointed towards a lack of user involvement as well the issue of force of habit in relation to the practical application of welfare technologies. Thus, it could also be a point of interest to research on what initiatives can be launched to address these challenges, in order to ensure the potential of welfare technologies.

As touched upon earlier, welfare technology also seem to represent a certain potential of growth, as Danish companies are increasingly pouring new technologies into the market. Thus, a further study could be to explore the growth- and export potential of welfare technology for Danish companies. As Reiermann & Andersen states, welfare technology in Denmark can become a highly productive growth industry in line with the wind turbine and the pharmaceutical industry. Until now, the export of Danish welfare technological solutions has primarily taken place in Sweden and Germany (Reiermann & Andersen, 2010: pp. 3-15). Thus, in order for Denmark to become a leading player on the market for health-related welfare technologies, a global mind-set must be incorporated. Besides that welfare technology can improve the welfare and create growth, it is also considered that the technologies can be subject for job creation.

Moreover, the thesis touches upon the newly agreed Financial Contribution, and it could be interesting to look further into how it will influence the future application of welfare technology in Danish municipalities. I sincerely hope that the investigation of the three solutions can be viewed as an inspiration for other municipalities that consider introducing welfare technology into their portfolio of services.

In conclusion, welfare technologies have a huge potential to address issues in modern Danish welfare society. Thus, it could be valuable to devote more effort to in-depth research on the subject, in order to improve the field of knowledge and further the practical application of welfare technologies.

7.0 Conclusion

The conclusion for this thesis brings together the important points that emerge from the analysis, and answers the initial formulation of the problem.

How can welfare technologies be viewed from a social innovation perspective; and what are the main challenges associated with the application of the three main welfare technological solutions in the Municipality of Copenhagen?

Danish Elderly Care continues to be threatened by rapid demographic development, radically reduced funds for public services and higher expectations from citizens for the quality of these services. These challenges put heavy pressure on Danish municipalities to develop new, innovative solutions, in order to ensure the future of the Welfare State. This thesis has revolved around the increased application of welfare technologies in Elderly Care in Denmark, as this has been one of the areas where municipalities have taken radical steps. This has been done by examining the three mature welfare technological solutions, respectively; *Electronic Bidet Toilets, Eating Devices and Safe Transfer Technologies*, from the Municipal Finance Management Act 2014. The main conclusion is that these welfare technological solutions and welfare technologies in general, represent a win-win situation for both citizens, employees and the municipalities, as they can significantly improve the quality of services for elderly citizens and optimally provide better working conditions for carers, while at the same time ensuring a more efficient provision of public sector services. Moreover, it has been concluded that there is a natural correlation between welfare technology and social innovation, as the solutions are all based on addressing a particular social need of the user. It is further concluded that welfare technologies can be characterised as radical social innovations, based on the fact that they require certain training courses and supersede existing services in the area.

Nonetheless, the analysis has also illustrated that the potential of welfare technologies has not yet been exploited to its full extent. Thus, the application of the three solutions in both Copenhagen, as well as in other municipalities, can be strengthened considerably. First of all, it is essential that the municipalities alter their perceptions of welfare technologies as one-size-fits-all solutions. This is because a solution requires an individual implementation. In addition, the interviews have identified an absence of implementation plans on the part of municipalities. This lack has lead to poor experiences and negative stories, which seem to affect the motivation of politicians, employees and citizens to welcome welfare technologies. The empirical material has pointed out that there is still a crucial need for municipalities to increase

both training courses for staff and to reinforce the involvement of the users. Thus, the thesis indicates that it is vital for municipalities to develop new initiatives in order to solve these challenges and to realise the full potential of welfare technologies. Despite the above, one thing is certain: *Welfare Technologies* are here to stay and will continue to revolutionise the future of healthcare, not only in Denmark, but also in the rest of the world.

8.0 List of References

The following is the list of references that have been applied in the thesis. The list is divided into; *monographies, academic reports, periodicals, organisational reports, unpublished resources and articles.*

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8.8 Interviews:

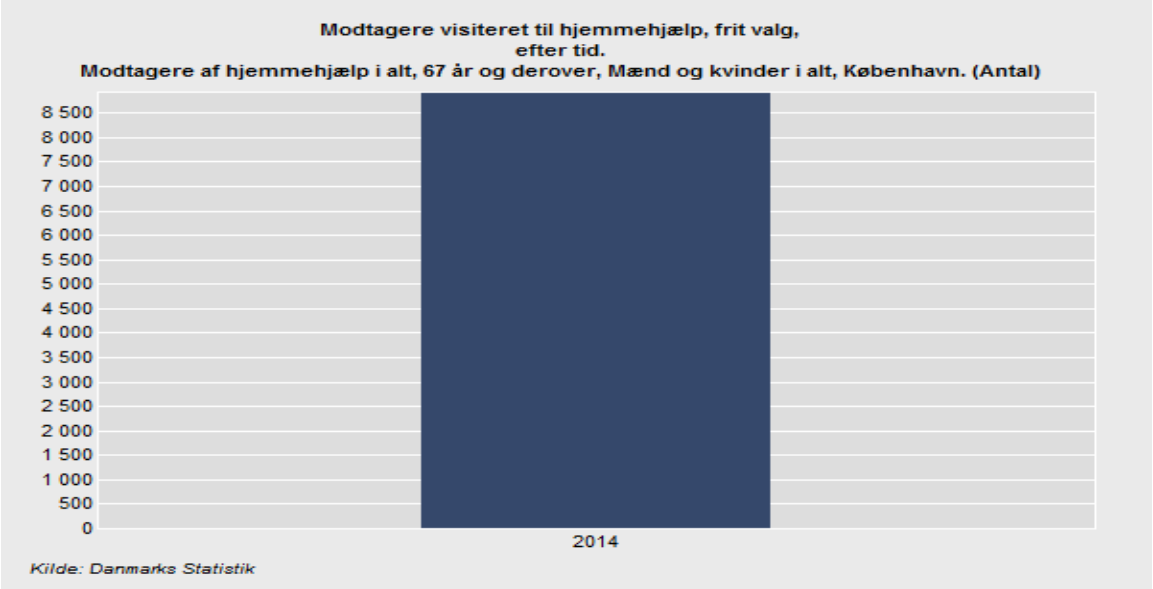
Birgit Jæger (2016)	Interview conducted at Roskilde University on 18.04.2016 Attached as an audio-file and as a resume in appendix 9.6.2
Ivar Havsteen-Mikkelsen (2016)	Interview conducted at Healthy Growth on 12.04.2016 Attached as an audio-file and as a resume in appendix 9.6.1
Gitte Duelund Jensen (2016)	Interview conducted at KL on 12.12.2016 Attached as an audio-file and as a resume in appendix 9.6.3

9.0 Appendices:

The following is the thesis' appendices that entail statistical figures from Danish Statistics, as well as the BRUS-surveys and the KL presentation of the four focus areas.

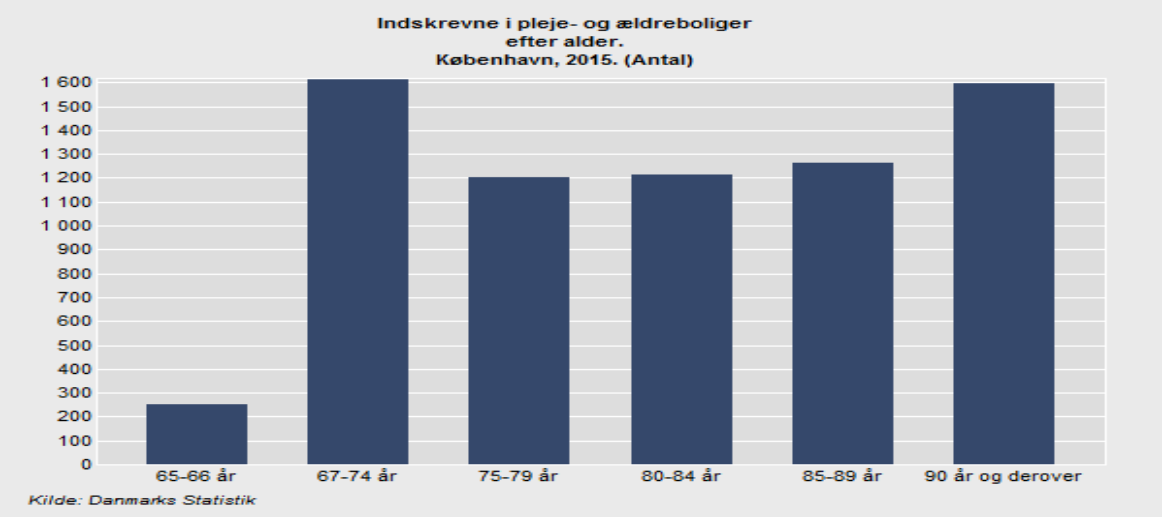
9.1 Danish Statistics (2015b):

The below figure illustrates the number of elderly people over 67 that received home care assistance in Copenhagen in 2014.



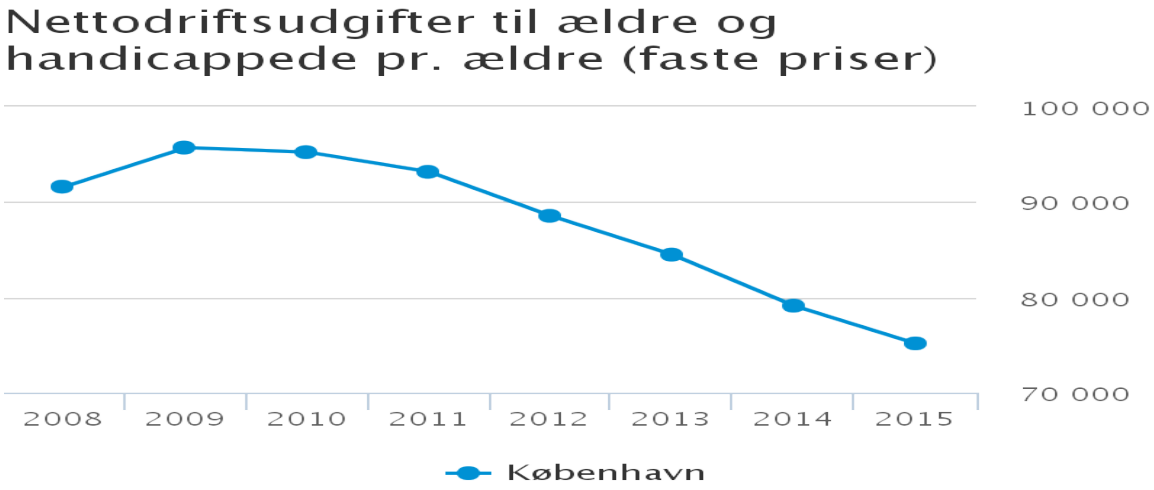
9.2 Danish Statistics (2014c):

The below figure illustrates the number of elderly people from 65 and above that were enrolled at a care centre or in an elderly home in Copenhagen in 2015.



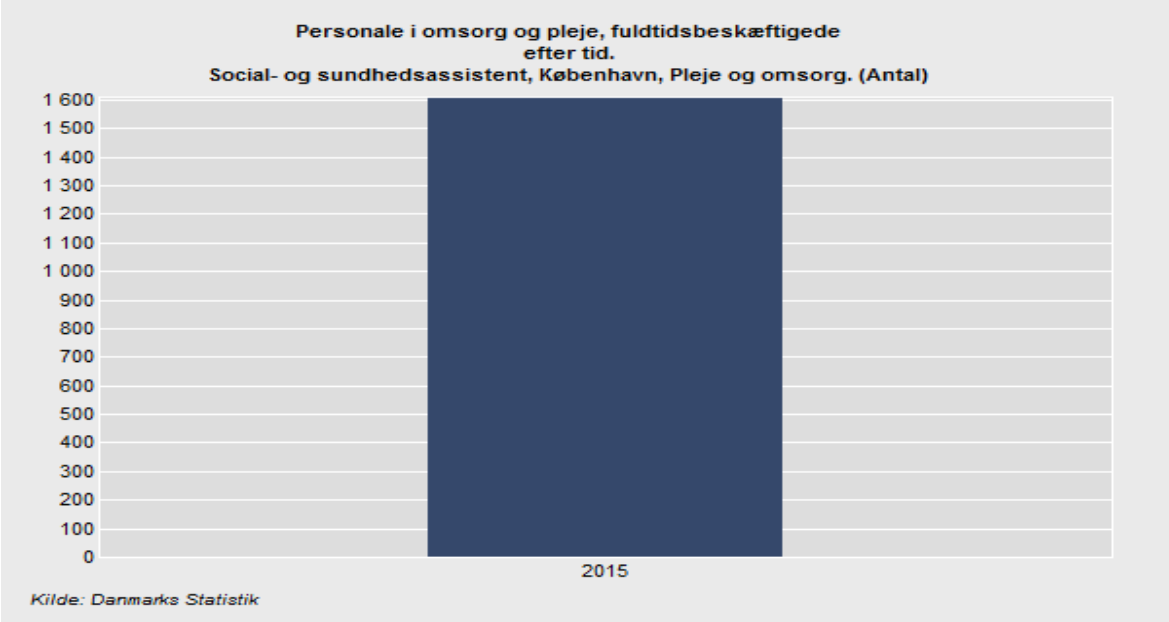
9.3 Danish Statistics (2015d):

The below figure illustrates the net operating costs (in fixed prices) for services for elderly and handicapped people per elderly in the municipality of Copenhagen from 2008-2015.



9.4 Danish Statistics (2015e):

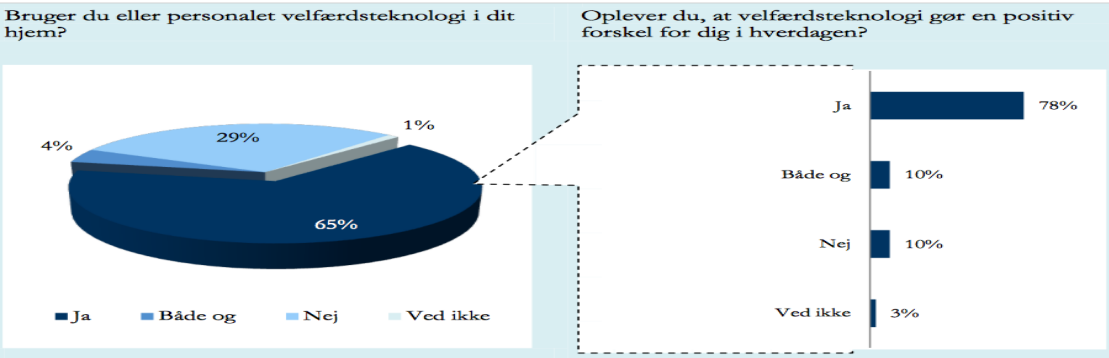
The below figure illustrates the amount of Social and Healthcare assistants employed in the municipality of Copenhagen in 2015.



9.5 BRUS-Survey - in Care Centres (2015a):

The first figure below illustrates the amount of the elderly respondents that have talked with a care staff about welfare technology in 2015. The second figure illustrates the amount of respondents that use welfare technological solutions, and if they experience that the solutions has a positive impact in their everyday lives.

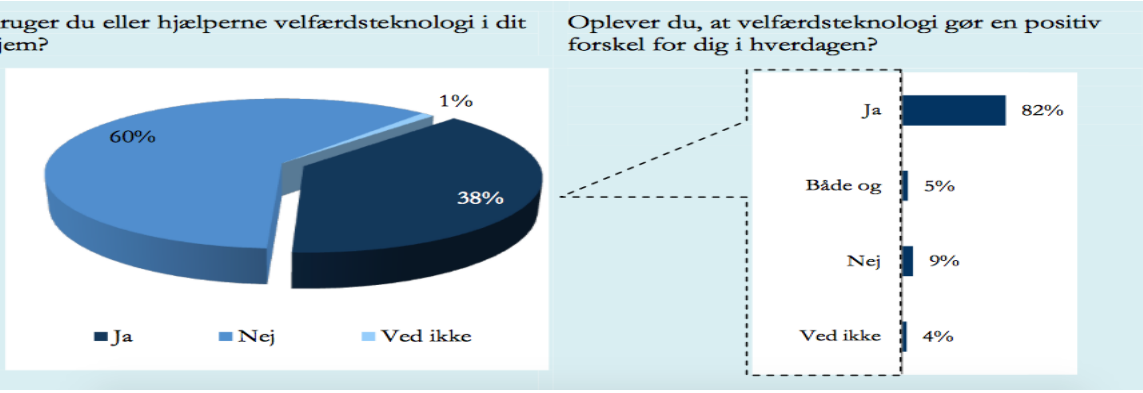
Andel, som svarer "Ja"	AMA	BIN	IBØ	VBH	VKV	SUF 2015
Taler personalet med dig om, hvad velfærdsteknologi kan gøre for dig?	14%	26%	27%	23%	29%	**24%**



9.6 BRUS-Survey – in Home Care (2015b):

The first figure below illustrates the amount of the elderly respondents that have talked with a care staff about welfare technology in 2015. The second figure illustrates the amount of respondents that use welfare technological solutions, and if they experience that the solutions has a positive impact in their everyday lives.

Andel, som svarer "Ja"	AMA	BIN	IBØ	VBH	VKV	Hjemmehjælpen A/S	Kommunale leverandører samlet	SUF 2015
Har nogen fra kommunen talt med dig om, hvad velfærdsteknologi kan gøre for dig?	31%	29%	36%	36%	37%	26%	34%	**32%**



9.7 KL - Presentation of the Four Focus Areas (KL, 2015l)

The following is a presentation from KL used for an Australian delegation in October 2015. The presentation entails translations of the four welfare technological focus areas.

A part of the public strategi for digital welfare 2011-2015

The rise of The Welfare Technological Program

- 3 year period

Four focus areas (three technologies):

- Ceiling Lifts
- Electronic Bidet Toilets
- Eating Devices
- Better Use of Technical Aids

DEN DIGITALE VEJ TIL FREMTIDENS VELFÆRD

DEN FÆLLESOFFENTLIGE DIGITALISERINGSSTRATEGI 2011-2015

REGERINGEN / KL / DANSKE REGIONER AUGUST 2011

Center for Velfærdsteknologi KL

9.8 Transcriptions of Interviews and Participant Observations:

The following is the transcriptions of the three interviews as well as the summary from the 2015 Network Meetings.

9.8.1 Transcription of Interview with Ivar Havsteen-Mikkelsen:

Interview conducted at Sund Vækst
Duration: 00.47.50
Date: 12.04.16

Interviewer: (00:05:00 - 00:05:06)
"*So can you shortly introduce Sund Vækst in relation to your general purpose and how you are organised*"

Respondent: (00:05:18 - 00:15:20)
"Sund Vækst lies in the Copenhagen Health and Care Administration (SUF). Overall there are three entities in the area of welfare technology in the Copenhagen Municipality or SUF. Firstly, we have the Housing Office (Boligkontoret), who is in charge of modernising, renovation and building of housings in care centres. They are typically in charge of the fastened welfare technological solutions such as housing lifts, sensor floors etc. Secondly, there is the entity of Auxiliary Services (Hjælpemiddelcentralen), who is in charge of the distribution and maintenance of welfare technologies for citizens in both care centres and in home care. And then you have us; Sund Vækst, as the last link… The reason why I mentioned the aforementioned entities is that we are working closely together, and that they have a huge importance for the work we do. Sund Vækst was launched a few years back, starting as a municipal programme, developing into an entity. The purpose of the entity (Sund Vækst red.) can generally be viewed as it is, to support the development of new welfare technologies for the citizens of Copenhagen Municipality. We work in a way where we try to get citizens and employees involved in a lot of the work we do. For instance we have the so-called - Living Lab Standvejen, where we have two employees. Living Lab is a real rehabilitation institution, meaning that citizens live here that is sick and need care. In here, we have an apartment filled with different technologies that physiotherapists and citizens can test and try out. When we have a new technology then our two staff members will first test the technologies in a so-called 0.0 version, a prototype that can detect errors and ensure the function of the technology. If we believe that the technologies can function, they will then be tested with citizens either at Strandvejen or at other care canters.

The reason why I mention this is that it can be viewed as the core foundation of our work and purpose - which is to find the good solutions, test them, and together with private companies develop the technologies further. But most importantly it is to test the technologies and ensure the desired value. We do this by a SCRATCH-method where we first test the technology in a 0.0 version. If the technology passes the test – we will then do a 0.1 test. We base the tests on the so-called VTV (Welfare Technological Assessment) reports, and then we structure it from an A3 method – a simple project tool. But the core of our process is that we run through this progress, where we can decide for each phrase if we should continue or not – thumbs up or thumbs down. In the 0.1 versions we test the technology on a number of citizens. The amount of citizens must be large enough so that we can provide well-documented data that can define what kind of business case that can be conducted.
If we still believe in the technology we will move on to the next phase, where it will then be subjected for our Investment House. It can be in matter of efficiency proposals, budget proposal etc. I.e. there are different pools that we can target our investment proposals after. So to sum up, Sund Vækst, is a team of employees that has the responsibility of testing and finding new

welfare technological solutions for the municipality to invest in. Therefore we have this setup with Strandvejen. Furthermore, we have these Mobile Living Labs placed at care centres where we have health care assistants with certified VTV training. At the moment we have around 120 health care assistants with VTV certificates. This entails that when we send out a new technology, e.g. to a health care assistant at a care centre, then the staff knows exactly how to use the technology and what to pay attention to. They have to pay attention to the citizens, the staff, the technology and the economy. So there is like these 4 fixed dimensions that you train people in. When assessing the technologies the staff therefore must evaluate them from these four dimensions. It is not only enough to value fi. the economy or the citizens, meaning that all four dimensions must be integrated in the assessment. So that is very much the part where we test the technologies. But, we are also very much defined by who we are cooperating with. For instance, the private companies provide us with what we live of i.e. a lot of new solutions and inputs. We also have a lot of various constellations. As I mentioned we have CHC (red. Copenhagen HealthTech Cluster) and CHI (red. Copenhagen Health Innovation). CHC is a co-operation between the Copenhagen Municipality and the Capital Region of Denmark in order to support the development of welfare technological solutions. The cluster is highly targeted towards businesses to create economic growth. On the other hand, CHI is about supporting the education in welfare technology and to encourage students to conduct studies on welfare technologies. Then we have a co-operation with DTU as well as professor; Helle Langberg in the area of rehabilitation. With other words we can be viewed as a mix of different actors – especially knowledge holders and process people. In the upcoming summer we are expecting to develop a Welfare Technological Academy in order to train and educate people in VTV. So this is sort of our organisation and our process, and we follow that in a relatively strict matter. Almost daily we receive proposals from companies, where they ask us if we have an interest in investing in their solutions. Instead of just saying - "yes, we would like that", we need to first research and find data on the solution – e.g. if another municipality has done something similar. And usually we run through the aforementioned process. Of course if a company argues, that they have already tested the technology in x,y & z municipality, then it is not like we say; "no no, we need to do the test ourselves", but it is more to say that we have this process that we usually work from, in order to ensure the value of the technology. When the technology passes a 0.2 version then it will receive a stamp indicating that the company has had their solution tested and a VTV report will then be published. Furthermore, Sund Vækst is also connected to the politicians and moreover we have a strong cooperation with our knowledge centres, in the matter that they sort of select the challenges that they want us to look at. Then we have HMC (Hjælpemiddel-centralen), which is very much grounded in the practical aspects, e.g. purchasing and repairing devices as well as sending them out to citizens. Then we also have the so-called Welfare Clinic (Velfærdsklinkken) that is a platform where citizens, companies and staff can propose new ideas - both challenges but also new solutions. I guess that there are around 200-300 idea proposals in there. At the moment Sund Vækst lies in the Department of Health and Care (SUF) but as of 1st of June we will be transferred to the Department of Digitalisation and Innovation.

Interviewer: (00:15:25 - 00:15:32)
"Then I would like to question - how does the municipality define the concept of welfare technology"?

Respondent: (00:15:32 - 00:17:45)
Within the definition we typically distinguish between what can be characterised as a device and what is welfare technology. And it is not that easy to come up with a precise definition. Of course we have a written formulation that we work from, but more bluntly told; An aid is, according to paragraph 112 (red. in The Danish Service Act), "a technical or personal aid" fi. an ostomy pouching system, a walker etc. A welfare technology is typically more advanced – sometimes we have distinguished it by technologies that could be electrified. But the challenge is, that what was a welfare technology 10 years ago is now considered as a device. Thus over time, a device will automatically transform to a sort of basic equipment. However if you ask a healthcare assistant then they will probably refer to it as a welfare technology. Generally speaking, we define welfare technology as something that can assist in the delivery of services – more notably welfare services within the area of elderly care.

Interviewer: (00:17:45 - 00:17:55)
"*Then can you briefly describe the municipal working tasks within the implementation of welfare technologies*"?

Respondent: (00:18:00 - 00:23:40)
Overall, the municipality can be viewed as solely responsible for the implementation of welfare technology. If we take a look on the different phrases, then we have the previous mentioned screening process where we test and decide on the technologies. In this phrase we look both at the gains but also on the prerequisites - meaning what will it require for the technologies to actually work and secure the gains. Then there is the second phrase, which is based on a public procurement process. Typically, there is a high demand for a specific technology, which means that we are required to make a public tendering, where we ask the private companies to come up with proposals for why their exact technology should be selected. Depending on the technology you work with, there may be various implementation strategies. This is what can be considered as the tricky phrase. As mentioned we can come up with several thorough feasibility studies that examine the prerequisites. We can also conduct procurements that provide us with the exact solutions that we seek. But then when we need to implement it, how do we actually do it? Generally, we have slightly different practices depending on if the technology is to be implemented in home care or at a care centre. If it is in care centres then the technology is typically sent to our HMC, who will then conduct a visitation and transfer the product to the care centres and the citizens. It can either be directly to the citizen or to the care centre. Typically it is directly to the citizen – An example could be; "an elderly citizen complains about back problems, thus a semiautomatic bed would be suitable for him or her – is it possible to get that approved?
In order to support the implementation and use of welfare technology we have held training days and information sessions. In addition, we have launched a new initiative where we send a bunch of savvy people out in the nursing homes such as therapists and welfare technology consultants, together with our technological catalogue. Then they view the citizen and his or her needs, and talk to employees about what could be the options in relation to welfare technology. The challenge is that sometimes the employees are not aware that these technologies exist. Therefore it is an important task to inform what is available and what are the potential gains. As you mentioned, there can both be staff-related gains and gains for the citizen, as well as economic gains for the organisation. We have not yet developed a definitive method for the implementation, but are working on a model, named VTI (Welfare Technological Implementation). In addition, we have one employee at a care centre that are trying to develop a generic model. We do not have that yet, but the reason why we still have a job is also that sometimes we can see that certain technologies are not being implemented to its full extent. This is for instance the case with Electronic Bidet Toilets that have not been implemented adequate enough. So the municipal tasks in relation to welfare technology is based on 1) screening of solutions. Then we have a task that I have actually missed which is the dissemination to politicians. Thirdly we have the public tendering and procurement process, and then subsequently the implementation.

Interviewer: (00:23:46 - 00:24:14)
"*My next question is in relation to the conducted BRUS-surveys, that primarily illustrates a high level of satisfaction with the welfare technological solutions among the elderly respondents. However the surveys also illustrates a lack of communication between elderly citizens and staff in relation to the welfare technological solutions – How can that be"*?

Respondent: (00:24:20 - 00:27:00)
It is also an issue that I consider is rooted in two causes. First, several of the employees working in the care sector are not aware of the difference between aids and welfare technologies. Furthermore, there are for instance not that many welfare technological solutions in the home care. There are some, but it is definitely the care centres that possess most of the solutions. We certainly have a desire that these numbers should increase, but it should be on the right basis.

Interviewer (00:27:10 - 00:27:21)
"Then how does the municipality relate to the four politically target areas of welfare technology – namely Electronic Bidet Toilets, Transfer Technologies, Better Use of Technical Aids and Eating Devices"?

Respondent: 00:27:22 - 00:33:00)
Let us take them one by one. Electronic Bidet Toilets or Washing/Drying Toilets - is one of the areas where we have invested heavily in. But unfortunately it is also one of the cases that have proved inaccurate - in the sense that the municipality have made investments where they have not had a focus on the implementation all. The municipality purchased several Electronic Bidet Toilets, and transferred them out to care centres and also some in home care. But they did not have a strategy for how to ensure the training and maintenance of the solution. Therefore several of these Electronic Bidet Toilets have simply not been used, and have just been put in a corner. Electronic Bidet Toilets can therefore be viewed as one of the focus areas where we have not succeed with the implementation, and where it has been significantly clear. The reason why we attempt to be very systematic when testing new solutions is also based on the fact that we have a desire not to have any more examples of failures - such as Electronic Bidet Toiletss. In addition, these failures also created severe headwind especially among employees. If a care staff has just once had the experience that a technology has been coming in from the right, where they have not been involved or received trainings, then we will face much more resistance when we implement another technology. So we attempt to work a lot with the mind-set that when we implement something, then we have also done what we can to take the employees by their hands and ensure how and why they use it. The staff should therefore feel that they are getting something out of working with us. In addition, we therefore work much according to the notion that the technologies in which we invest and purchase, must be something that citizens and employees want. This is also one of the objectives of the previous mentioned; Strandvejen, where we can obtain the employees and citizens immediate reaction on the technologies. It is therefore of huge importance that we involve employees and citizens in the testing phrase. Sometimes we have even experienced that technologies disappear from the testing apartments, where employees have thought: "I will just borrow this one" because it is working really well. Thereby, we get a sense of which technologies are actually working, and which is not working at all. I believe that the Electronic Bidet Toilets can easily "turn" citizens and employees "on" - there are also plenty of studies showing the positive effects of Electronic Bidet Toilets. But the solution also requires that the citizen feels comfortable using it. We have several examples of Electronic Bidet Toilets that have been installed but are not used because citizens do not dare to use them. And it is a huge challenge. Situations like these have therefore created certain negative images and bad stories of welfare technology. Therefore it is extremely important to have a specific implementation plan when applying the welfare technological solutions.

We have also tried to implement Eating Devices, but without great success. This technology is furthermore not one of the areas that we plan to work further with. This is due to the fact that, firstly; we have relatively few of them, and secondly; the experiences are not especially positive. I have furthermore not experienced that other municipalities have implemented them with much success.

We work a lot with Safe Transfer Technologies and we have sent several proposals to politicians regarding the increased use of these certain technologies. We also focus on the Better Use of Technical Aids. However, this area is slightly broader, but we still apply the mind-set in our work. This can for instance be viewed in our trainings where we focus on educating staff in improving their use of technologies. But it is not an area where we have developed a specific implementation plan.

Interviewer: (00:35:35 - 00.35:50)
My next question is related to the implementation in practical terms - and how the change of workflows can represent a challenge for the implementation of welfare technology?

Respondent: (00:37:00 - 00:37:43)

One of the key elements of welfare technology is the change of workflows. This always occurs when implementing something new. However, there may be some technologies that require the staff to radically change their workflows, and this can be particularly challenging. Despite the fact that employees and citizens say; "That this (the technology) is really great" and acknowledges the positive gains, they can still argue that they are satisfied with the old working flow. Therefore there may be several barriers when implementing welfare technologies, since staff, citizens and other persons in the organisation are accustomed to specific workflows.

Interviewer (00:41:13 - 00:41:15)
Then what about the current Government's idea of reprioritisation payment - Will this have any influence on the implementation of welfare technologies in the Municipality of Copenhagen.

Respondent: (00.41:16 - 00:42.30)
In relation to the reprioritisation payment, the Municipality of Copenhagen has chosen to stand outside and decided that we will not be apart of this. Every year, we must nevertheless go out and find 40 million, so we are used to this kind of practice. In addition, the Municipality of Copenhagen earlier earmarked 500 million to new smart welfare solutions, in which welfare technologies are apart of.
The idea that one can invest their way out of efficiency is furthermore not new for us. The amount that the Copenhagen municipality would supply has been significantly reduced. Now it is just what it used to be - that is 40 millions each year, which are then distributed to other policies, so the money will probably be in the system.

Interviewer (00.43:39 - 00.43:41):
My last question is related to - What kind of main challenges occurs when implementing welfare technology.

Respondent: (00:43:49 - 00:47:15)
The main challenges in relation to welfare technology are gearing up the care centres to apply the welfare technological solutions. This entail everything from staff training, to ensure that care centre managers are aware of what solutions exists, as well as to change the workflows. One thing is to come up with a technology that provides a temporal gain. However, if the temporal gain is not translated into e.g. the duty roster, then the gain will not be harvested. I believe that the technologies that we possess, and which we have invested in, can lead to certain gains. But as mentioned, they require that several factors should be in place before the gains can appear. This can especially be viewed in relation to our bad experiences with Electronic Bidet Toilets. These were mainly purchased in 2011, 2012 and 2013, at a so-called cowboy-time in which everything had to go as fast as possible. Right now, we are in a period where we are doing things more cautious, and much more analytical and systematic.

9.8.2 Transcription of Interview with Birgit Jæger:

Interview conducted at Roskilde University
Duration: 00:27:16
Date: 18.04.16

Interviewer: (00:00:33 - 00:00:36)
"How do you define and characterise the notion of innovation"

Respondent: (00.00:40 - 00:07:07)
To begin with, there exist the so-called classical school of innovation derived from Schumpeter. Here there are some very clear definitions on innovation, which is when someone gets a new idea or new knowledge that can be used in a new way. Back to its roots, it was typically scientific knowledge that was converted through engineers to certain technologies that entailed the start-up of companies, which could then produce and send the products out on a new market. This is the core process of Schumpeter's innovation that investigated how growth is created in society. The notion of innovation can therefore be viewed as it is the crank of the capitalistic social order –i.e. it is through innovation that growth is created in societies. Innovation is therefore still a key concept in today's society. Since that time the notion of innovation has changed immensely and several new directions has come into existence. Some talk about entire innovation systems, some speak of diffusion of innovation, and this and that. With other words there is an entire landscape of innovation theories, which would be very difficult to uncover. At this institute we have focused on one of the latest approaches where the emphasis is on innovation in the public sector. Politicians are nowadays emphasising on the importance that innovation also has to be applied in the public sector, and therefore the concept changes. You cannot just convert the concept to the public sector, as it was developed in the private sector. You have to put it in relation to the public sector, and the values and objectives that exist here. For instance, the classic innovation mind-set argues that before you can talk about innovation, there must be an economic value. This is like the final result of the innovation. Therefore you have to discuss what kind of value can be derived when working with innovation in the public sector. In addition, it can also be an economic value, in form of cost savings and efficiency, but it can also be something else. It can for instance be "improved services for citizens, or that we are able to solve any of the problems which the welfare state is facing in a better way than we have been able to do it before. That we can use it to create a more democratic society. Better equality for the law, greater legitimacy etc. ". So when we talk about innovation in the public sector we view it as something that can create several different types of values. Some view it, as it has to create value in the public assets, which can be viewed as a common framework to describe it in. Therefore, innovation becomes a little different when you talk about it in a public sector context. For some years ago we had a large research project regarding innovation in the public sector led by Eva Sørensen. Our understanding of the public sector today is very much based on network management that in recent years has become a common way to understand the public sector. Therefore, if we have to put innovation in relation to this, we decide to call it; collaborative innovation.

In addition, the classic notion of innovation pays attention to the entrepreneur, who creates and drives the innovation. When we transfer the concept of innovation to the public sector, we argue that there is not in the same way an entrepreneur present. What occurs in the public sector is instead that different actors work cooperatively through different networks. In order to create innovation in the public sector it is therefore essential to mobilise these different actors who are already involved in operating the public sector. When we transfer the concept of innovation in the public sector we therefore argue that it make sense to talk of it as; collaborative innovation. There are several that work with public innovation without calling it collaborative innovation, but that was what we did.

Interviewer: (00:07:09-00:07:13)
"Then how do you see the approach of co-production in relation to innovation"?

Respondent: (00:07:14 - 00:07:39)
From my point of view, co-production emerged from the collaborative innovation. An important part of collaborative innovation is also about looking at how to collaborate with citizens and users of public welfare services. And that is what people are starting to call co-production.

Interviewer: (00:07:39-00:07:44)
"Then how does collaborative innovation differ from the notion of social innovation"?

Respondent: (00:07:45 - 00:11:48)
Social innovation is a somewhat different concept with a slightly different story. If you look at various literatures you will see that social innovation has been used in innovation studies much earlier. What I perceive as the roots of social innovation are some descriptions of Benjamin Franklin back in the late 1700s, created libraries and fire departments. Out in the small American society he saw that it made sense to collect books at a place and give the opportunity to borrow them, which can be considered as the start of the library system. It was sort of the same with the fire departments where it made sense to make some voluntary schemes, meaning that if there were a fire you would help out to extinguish it. This can also be viewed as the beginning of the fire department. At that time social innovation was used to define new practices that solved certain social tasks in society. Today, there are researchers who use the word to describe public innovation. That is just to say that if the innovation takes place outside the private sector then it must be social. But then there are also those who add an empowerment aspect to social innovation, where they argue that in order to call it social innovation you must lift some segments of society – for instance ghettos. Katerina Juhl Kristensen has written about those various schools of innovation within the last ten years. As far as I remember she defines the notion of social innovation into three different schools.

Interviewer: (00:11:52 - 00:12:06)
"Then I would like to move on to the use of Welfare Technologies in the Danish Elderly Care. Firstly, how do you define the notion of Welfare Technology"?

Respondent: (00:12:07 - 00:14:45)
As you may know, I have worked with Digitisation Projects in the public sector for several years, where the aim was to digitalise the administrative working processes - i.e. the whole public engine. Here the main focus was on the processes. Now you have reached a point where the development rolls out of the administrative sphere, and to the citizens. This can for example be viewed in relation to the increasing demand that citizens use digital channels to communicate with the public authorities. But the development is also subject for the large welfare policy areas, which to a large extent has been exempted from having to deal with the digitisation process. The development can also be viewed in the elderly care where you started by digitalising the administrative procedures and the way you organised the workflows, but now the process must be spread out to the individual employee, the elderly citizen, and in the care centres etc. And in this segment it is of course other technologies that are applied - here we are suddenly talking about Electronic Bidet Toilets, washing machines etc. Therefore, nowadays the digitalisation can be viewed as being more focused on the different products rather than the processes.
And that is especially due to the introduction of welfare technologies, where the notion is much more product-oriented.

Interviewer: (00:23:30 - 00:23:37)
"Then how do you view the correlation between social innovation and welfare technologies"?

Respondent: (00:24:00 - 00:26:00)
First of all, it is essential the point out that the general perception towards technology has changed a lot in the recent years, and that technologies today can be considered as socially constructed. Technologies are therefore no longer perceived as something that only arises from the natural sciences, and that technologies can only be seen in a certain way. Within this realisation there is the also the basic idea that the users play a significant larger role in the development of these technologies and that it is a prerequisite to involve the users in the

process. And virtually the sooner the better. In addition, there is also this mind-set that we should not just sit and wait for the private actors to develop the products, and that it is much more productive for all parties that the end-users are involved.
When you view welfare technology - then the end users can be viewed as a combination of an elderly citizen as well as an employee from the municipality. And there it is of course important to get both parties involved. Otherwise you will have certain situations where the welfare technologies are just being put in a corner where they gather dust. And where the elderly might actually want to use them, but where the employer becomes a barrage. Furthermore, relatives, for example, children can also influence the elderly's view on the technologies and have a say in whether the elderly embrace the technologies or not.

9.8.3 Transcription of Interview with Gitte Duelund Jensen:

Interview conducted at KL
Duration: 00:53:03
Date: 18.04.16

Interviewer: (00:02:04 - 00:02:50)
"*So can you shortly introduce KL's Centre for Welfare Technology and how you perceive the concept of Welfare Technology"*

Respondent: (00:03:01 - 00:10:24)
"KL's Centre for Welfare Technology is a small entity with four persons that was established in 2013 after the Municipal Finance Agreement for 2014 was decided. KL and the Government agreed to push on the large-scale implementation of mature and tested welfare technological solutions in the Danish municipalities. It was agreed that KL should thereof facilitate and support the implementation of the four focus areas in all of the 98 municipalities. This was to be succeeded in a three-year period from 2014-2016 - with annual measurements underway to follow the dissemination. The agreement entailed the final goal that all local municipalities should have implemented all solutions by the end of 2016 with a total gain realisation of at least 500 million. As part of the exercise it was also an objective to create a better and shared documentation culture in the municipalities. The aim was furthermore to increase the sharing of knowledge between the municipalities, which arose from the reasoning that municipalities often have difficulties with sharing information with each other. This is especially when it comes to practical experiences with large organisational changes, when there is either an inadequate documentation or several very different documentations. Therefore KL decided to establish the entity with four persons that should work directly with the dissemination of the four target areas within the 3-year period. When the Centre was established we decided relatively quickly that we would not commit ourselves to a specific definition. This was due to some very pragmatic reasons, since welfare technology in itself is a very abstract concept. One can say that it is overall; technological solutions used in the production of welfare. But production of welfare can be considered as many different things. We predicted at that time that if we committed ourselves to one specific definition, then we would risk ending up in a kind of religious war - that would "only" lead to a lot of discussions. Then we would have used a lot of time and resources to develop a specific definition and then it would not be possible to reach our goals.

Interviewer: (00:10:32 - 00:11:34)
"*How do you view the three socio-economic gains - improved self-reliance, improved working conditions and financial leeway, in the dissemination of welfare technologies?*

Respondent: (00:11:38 - 00:16:24)
If we stick to that fact that we are an agreement-defined entity with a performance contract with certain goals that need to be fulfilled within the three years - then it can be considered that the work-environment related gains is not inherent in our work. Of course, the agreement is based on the overall development that has occurred in the elderly and social areas - especially in relation to rehabilitation and the fact that citizens who become more self-reliant can benefit - both the public Denmark and the individual citizen. But there are not any performance goals in the agreement in relation to the improved quality of life and increased dignity for the citizens. Thus, it is not part of the program that we go out and ask the citizens when we prepare the Status Reports. The only goal that is formally listed in the agreement is economy. But as a program-entity we have decided that we need to balance the effort, so it will make sense in the production of welfare - both for those who receive it, namely our citizens and for those who provide, namely our employees. But the notion of these three bottom lines is actually something that we have developed in cooperation with the municipalities. However, the levels of evidence for the three bottom lines are different, but it is clear that the focus of our work is on the economic incentives.

Some definitions are relatively extensive and attempt to get around both the community - i.e. there must be added value for society, there must be added value for the individual - meaning it has to balance between the society and individuals. It can therefore both have a value-based nature, but also a resource-based nature. Some definitions also entail an employee perspective, but it is very rare that the definitions count this perspective particularly high. Furthermore, the different definitions of welfare technology vary a lot depending on where in the organisation it is used and has to make sense - whether it is in a city council, social administrations, at a care centre etc. - who need a common frame to understand welfare technology from. When you get further down in the organisation, there are usually not that many words in the definitions, since they are very focused on the user's experience, and in most cases these definitions do not entail a focus on the resources. So, it really depends on the context in which the welfare technologies are being implemented.

Interviewer: (00:16:35 - 00:16:38)
"*Then how do you view the correlation between innovation and welfare technology"?*

Respondent: (00:16:41 - 00:26:42)
From my perspective, innovation is where we do something radically different and the reasons can be various. Since innovation can be initiated anywhere, then the term can also be different. If, for instance, an employee at a care centres receives a generally good idea that when it is used in practice - turns out to be a radically great idea. Or if a municipality has such a tremendous challenge that it is forced to make a radical restructuring of its business, in order to continue to run the business. This can also motivate and initiate the creation of innovation. The correlation between innovation and welfare technology is a bit interesting. For me, it can be both in situations where an organisation integrates a welfare technological solution - in a context in which the solution is not at all designed for. There are various solutions on the market that are developed for the needs of the market. But then if a bold and creative employee view that this exact solution can be used in our production of welfare in a totally divergent context and in an entirely new way - that makes excellent sense. For me, this is a beautiful picture of when a welfare technology and innovation goes hand in hand. I.e., when one is not involved in the product development phrase at all, but apply a mature product in a new way. Another way of viewing innovation can be, when you identify a need - usually a citizen with a disability, that he or she can not immediately receive assistance for. Of course you can receive assistance from a staff or relatives, but then you are dependent on them and their assistance. And therefore you develop a product that entail that you can take care of yourself. One of the solutions - more notably the Eating Devices, has been developed from this mind-set. A Swedish citizen develops the Eating Robot since he suffers from Schelorese or something similar. Early in his illness he acknowledges that; "*in the long run I will not be able to eat by myself, and I would not put myself or my wife in a situation, where I am dependent on my wife to feed me - since I perceive this as very degrading for my life quality. Therefore I develop a solution that entail that I can still be able to eat by myself*". This is also innovation and welfare technology, but where it is the person with the disability that creates the development process for a solution. A third model is when a professional consider that there is a certain need that can be addressed. When it is a professional then it will typically be a need that the professional view as applicable not only for one citizen but for several citizens. There is therefore a natural connection between welfare technology and innovation because the solutions usually occur from a beneficial idea that has been developed on the basis of a specific need. Unfortunately, sometimes we face different studies that indicate that the employees and citizens are only to very little extent involved in these innovative processes - Despite the fact that it is those who use them. And that it is a huge issue.
I want to say this, because I think it is a problematic view, which I simply cannot recognise. However, it does not change the fact that it is a story that exists for some reason.
From my point of view and the knowledge that I have obtained, then I would argue that there are very very few innovative processes without close involvement of employees and / or citizens.
Then there are also those solutions - and then you can discuss whether it is innovation or market development - that we are presented for. When I say we, I mean KL and the Municipalities. The solutions are purely market-driven, meaning that a technological nerd within a company has received a good idea and then he or she develops the idea. And the idea itself

is not bad, but this dedicated nerd has to a too small extent been in dialogue with the market, which can both be citizens and employees who will use the solution - and with organisations that should purchase and operate the solution. This will entail that this type of solution will have / or already has a difficult time on earth, since it will be difficult to sell them. This is due to the fact that the solution has been developed on the basis of a separation from the market. So when we talk about welfare technology and innovation, you can also put another criteria on - more notably; "successful innovation" - where welfare technology can be considered as an output of this. Thus, there are of course also the opposed notion; non-successful innovation - and it is typically those companies where they have not been in contact with the market and find it difficult to sell their products.

Interviewer: (00:26:50 - 00:26:53)
"*Then how can welfare technologies assist in solving the issues in the current Danish Healthcare system?*

Respondent: (00:28:00 - 00:31:50)
A very used and popular way to put it is; that we have to deliver our public services to a greater extent and with a better quality, just cheaper. This has developed into a very populist mind-set. With our focus on the municipalities there are various drivers that point to the same direction. For some municipalities, the economy is the primary driver. They simply do not have the financial stability to continue unchanged. They have to do something to improve the efficiency of their production. In addition, there are no politicians who desire to make the production more efficient by reducing the "goods". This can of course be possible to some extent by regulating on your service level. In this context, welfare technologies offer a cheaper way to perform the same tasks at the same quality - and sometimes to an improved quality of service. That is one driver. We usually say; "we keep the economy steady despite an increasing demand". Another driver is that some municipalities are experiencing recruitment issues with the employees who solve these tasks. This is still in a small scale, but it will be something that will increase more in the coming years. Not so much on social and health care workers, but more on social and health care assistants and nurses. As far as I know, there are no issues on occupational therapists, but it may be coming and some municipalities might currently experience it. And that can be viewed as another driver. If a municipality actually has a payroll ready to solve the tasks in the elderly area, but that the municipality simply cannot recruit qualified employees, then you need to solve your tasks in a different way. And a few municipalities have already had these experiences, where it is not so much about the economy, but instead they just lack the hands to perform the tasks. A third driver can be considered as - when you have a lack of employees then it is important to care extra good care of these.
You must be careful that you do not toil your employees more than necessary, and these employees already have a hard physical work environment. You must also ensure to the extent that it is possible that your staff stays with you and do not seek employment elsewhere. So it is also a way of developing improved working places, and that is also where there are certain challenges - for how is it that we understand the good working place. The employees should preferably also understand it as a good working place and this is also an investment in them.

Interviewer: (00:31:53 - 00:32:19)
"*In relation I would like to question you about the various myths of Welfare Technology and if you believe that these are true?*

Respondent: (00:32:21 - 00:37:00)
Yes, it is a fabled area. One of the myths is that if we implement welfare technologies it is because we should save some FTEs - i.e. fire some employees. This program has been running for three years now, and we have never experienced that when a municipality has implemented welfare technologies they have also dismissed employees. There may be a single or two examples where it has been the case, but there has not been a causal relationship between the implementation of welfare technologies and the dismissal of employees. The mythical is in fact the concatenation of that - when you implement welfare technologies then you will also automatically dismiss professionally and skilled warm hands.

Instead the implementation of Welfare Technology is a movement that is done to keep the economy steady or to save. And the technologies are compensatory initiatives to invest in the future, so the municipalities avoid continuing to save employees, but instead can work more intelligent with the efficiency of their production.

Another concern that may lead to mythical dimensions is that we restructure our elderly care so radically that we leave elderly people alone, since they will not anymore receive visits from a municipal employee to solve some tasks for them and with them. Now we leave them alone at home with the robots and so they languish in solitude. And we are far from finished with this discussion. For this is a very good, healthy and necessary discussion of what the public tasks in Denmark are. What kind of core services is it that the public authorities shall provide to its citizens, and when is it that the authorities' services stops and the civil society takes over. And have be been too accustomed to the our Welfare Society and the notion that the public is taking care of us and all our needs - even our need to be with other people. The very hard-core consequence of this will be that we completely write off the family, since we have a Welfare Society that takes care of it all. Is it really a healthy development? Therefore, when we implement welfare technology then we are also scratching to this notion. It is not carved in stone that this is how it has always been in the world and in Denmark. It is also a development that we have seen through the construction of the welfare state in Denmark. If you go 100 years back then it was a completely different situation. Therefore the technology becomes a subject of criticism, but in principle it is only a symptom of a development.

Interviewer: (00:37:06 - 00:37:22)
What kind of image can be derived from the latest Status Report on the dissemination of welfare technologies?

Respondent: (00:38:05 - 00:41:00)
It generally shows that the landscape is getting greener - in the sense that more and more municipalities report that the three solutions are under implementation or fully implemented. *However, it should be mentioned that a municipality could report that a solution is fully implemented one year and the next they can respond that it is under implementation. The reason for this is that an organisation often stays in the process. Sometimes a municipality discovers a new target group that is not included in the solution and where it will make great sense, and therefore we launch a new implementation process in this area - and then you will naturally have another implementation date. The reason why I mention this is that people can sometimes be a bit confused since it can tilt up and down. But I actually consider it as a healthy development that you continue to stay in the implementation process. A municipality also generally does not work with a linear process where they devour through all the phases. In the healthy implementation process there will also always be a return, where you go one year back and check if you still do what you think you are doing. Generally speaking, the municipalities are implementing the solutions that the agreement demands and in the right volume. 87 municipalities have reported back and are included in the Report. In relation, to the economic demand of finding net gains for 500 mil. DK, we are currently at 433 mil. DKK. And there is still one more round left.*

Interviewer: (00:41:05 - 00:41:25)
What solutions are most advantageous in relation to the social and economic gains?

Respondent: (00:41:32 - 00:47:47)
The three target areas are indeed very different. In relation to the ceiling lifts, then there are still on-going discussions about the quality for the citizen, and there are no doubts that this solution may not be suitable for some citizens. However, this is not different from the fact that a walker may also not be suitable for some citizens. As I see it, this is a subject for compensatory area in a whole - some citizens can benefit from a standardied solution whereas others may need something else. In relation, to the economic gains then there is no doubt that ceiling lifts represent the largest economic potential. And it is also a fact that it is this potential that municipalities to a large extent also harvest. At the same time, it is also the solution that has the

greatest impact on the physical working environment for staff. In addition, every day there are extremely many transfers performed in the municipalities.

The solution of Electronic Bidet Toilets is a little more complex, due to the fact that it requires some efforts beyond the Bidet toilet in order for the citizen to be completely self-reliant when toileting - fi. It requires that the citizen can dress down and up, that the citizen can get to and from the toilet etc. It therefore requires a little more effort for such an entire process to function. However, in those situations it where actually works then the citizen will experience an extremely high quality of life. This is partly in the area of elderly care where the toilets provide the elderly with an obvious dignity. But also in relation to sick and disabled youths - especially for those who are chronically ill such as persons with sclerosis. Also ordinary disabled adults are very satisfied with this solution, since they have received the assistance from a caretaker for their entire life and that they now can do it by themselves.
It is in many ways more difficult for municipalities to isolate the economic gain from the use of Electronic Bidet Toilets, since those who receive assistance for toileting also receive assistance with many other tasks.

So to take 4 minutes of time saved from a working list for an employee can be difficult to capitalize. But it does not change the fact that in situations where the municipality has succeeded in making both citizens and employees familiar with the toilets, then it has resulted in very high quality of service for the citizen and in some instances also for the employees who would avoid standing in stressful situations. And for some citizens the assistance can also result in some conflictual situations that the staff and citizens now avoid. But the solution is also a little more complex due to the fact that it is unknown - basically then neither citizens nor employees know the solution, and it actually takes some time to get used to it.

When it comes to Eating Devices, then there are only a very few municipalities who harvest the economic gains. Fewer and fewer municipalities also try to implement the concrete Eating Devices and instead chose to implement other similar solutions such as support arms, available both with and without motor. The reason is that these solutions can compensate and assist in other situations. They may therefore be used in other everyday situations than just when the citizens eat. It therefore makes perfectly sense for the citizen to use other solutions, as the eating robot can only assist when eating.

Interviewer: (00:48:06 - 00:48:16)
What are the main challenges when implementing welfare technologies?

Respondent: (00:48:22 - 00:51:26)
When an organization purchases a welfare technology, then there is a challenge that the organization may not have made it clear why they do it. If the organization has made it clear then there is also a challenge to make sure to communicate it meaningfully to the rest of the organization. If the organization fails to do this, then those who will use it in their everyday life and change their way of working - do not know why they should do it. Such a situation is where the myths about welfare technologies derive from. Another challenge in the implementation is that in some municipalities then the investments lies under a certain administrative department, but the economic gain that you can harvest from the solutions will be in another department. So quite frankly, silo thinking and the notion that you maximize your budget within your own department - that can be an enormous challenge. Additionally, a challenge can be that employees do not receive the proper training for how to use the specific solution. And if the employees do not receive the trainings then you will automatically view it is a bad idea since you have never received the answer for *why* to use the solution. At the same time, the implementation also requires the change of focus from the management both from politicians and top officials, but also from managers at care centres etc. And if there is not a change of focus from the management then nothing will happen. In principle, it is old knowledge, but it does not change the fact that this does not happen everywhere. There is not a change of focus from management everywhere. And this is one of the core activities by launching a three-year program - namely that you say the same for three years.

But there are still places where it does not occur. One thing is common knowledge, another thing is practice - these are two very different things.

Interviewer: (00:51:35 - 00:51:50)
How do you consider that the highly publicised Reprioritisation Contribution can influence the implementation in municipalities?

Respondent: (00:51:53 - 00:52:47)
One can simply not generalise about this fact yet. The Reprioritisation Contribution is a government initiative and a way to regulate the public municipal resources and a way to regulate the relationship between parliament and municipalities. It can be considered as such a new invention that we still do not really know about the consequences. However, in some way it will definitely influence the implementation, we just still do not know how and to what extent. At this time, I cannot say more about this fact.

9.8.4 Summary of 2015 Welfare Technological Network Meetings (KL, 2015m)

Summary:

WEFARE TECHNOLOGICAL NETWORK MEETINGS AUTUMN 2015

KL

No. of Participants

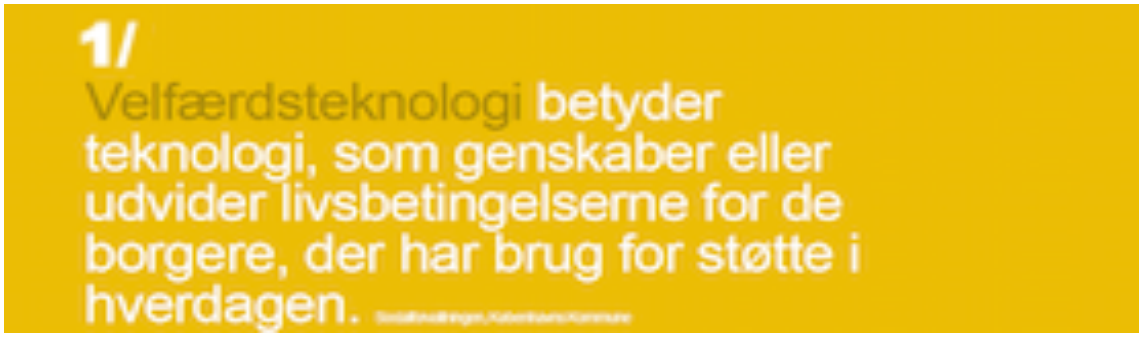
Capital Region of Denmark
No. of participants: 20

Region Zealand
No. of participants: 26

In Total: **46**

Appendix

The below figures illustrates two definitions of welfare technology provided by the municipality of Copenhagen (no. 1) and the municipality of Frederica (no. 2). These were presented and discussed at the two Network meetings.



Expectations

• Measuring Effects:
- What is gains-realisation and where are the gains?
- How do you realise a business case?
- Different measurement criteria / assessment methods. There will be many new that you have to relate to, and what can we agree on?
- Documentation Balance

• Status Report 2016:
- Knowledge of how to prepare for the status measurements
- Where do we find the correct numbers within the municipality?

• Knowledge Sharing:
- Inspiration from other municipalities
- What does the good municipality do in the area of welfare technology? - Characteristics

• The 4 Areas:
- Experience with eating devices for the elderly (Birgitte Schmidt, Stevns Municipality)
- Isolated efforts; e.g. IT-based technologies for adult disability area, such as apps and virtual housing assistance
- What comes after the four stakes?

• KL and CFV
- How to use KL's Centre For Welfare Technology?
- Messages from the joint municipal and joint public digitisation strategy
- Barriers and KL's role in the public interest?

The Economic Gains

• How to measure the efficiency when you have growing customer groups but constant expenses?

• Compared to the calculation of value per. technology, we must be aware that ceiling lifts can be purchased for relief, not only for 2-1 during transfers. To calculate the value of one technology is therefore a potential source of error.

• It is important not only to measure the economic benefits, but also the improved working environment for staff and quality of life for citizens.

• It was proposed to change the concept “Durable gains in 2016" to instead "Expected gains in 2016.

• It is uncertain for the municipalities where they find the right numbers internally.

• We must be wary of asking for transfers 2-1, for it is not always that the savings are in reduced employees, but in a time saver.

• Correlation for the future may for example be based on national averages or from implementing degree.

• Questions for 2016 gains are expected, and we ask for them again in 2017. Therefore, it is an estimate, we ask for.

• Assessment of citizens in the target group to better use of technical aids, which aids can make citizens totally self-reliant.

Municipal Inputs

- Greve Municipality: When an older SSAs retire it make most sense to replace him / her with a nurse. The competencies and the economy are about the same.
- Lejre and Lolland have issues finding qualified workers - especially SSH'ere and SSA'ere
- Common Medicine Card is a time waster
- The demand for clearer linkages between rehabilitation and welfare technology. Most technology can be categorised under better use of technical aids, if used properly.
- There are no major gains in welfare technology for small municipalities (5% is not worth it).
- Request to turn up for smaller projects