

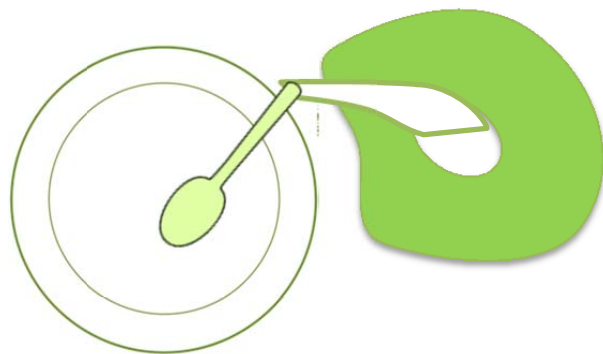
SKAL DET SERVERES MED DET NYE BESTIC?

A techno-anthropological investigation which attempts to add nuances to the original design assumptions of the **assistive eating technology.**

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Introduction

Development and use of technology is a widely spread phenomenon and probably touches upon every possible area of modern everyday life (Lie & Sørensen, 1996:1). The practices around technology makes up a huge share of our routines and is deeply entangled in the way we communicate, transported and coordinate our lives (Børsen, 2013). To be honest we have long passed the point of no return (PONR) in a technology-free life. Therefore the situation, at present, no matter whether we want it or not, that technology is here to stay (Birbark, 2013). There are innumerable possible ways of approaching the investigation of use of technology e.g., from an academic point of view, marketing, engineering, philosophical, designer, social perspectives (Birback, 2013).

Social science scholars agree that the matter requires close attention and a lot of studies have been made on the subject (e.g, Lie& Sørrensen 1996, Pinch & Bijker, 1987, Law 2009, Flyvbjerg 2013, Børsen 2013, Bjögvisson 2012). However there are quite a number of discourses in relation to methodologies on the issue. Publications have become a battle field where positivistic techno-utopians (Mankind in Transition, Masse Bloomfield, 1993), anti-utopians and techno-pragmatics (David H. Guston, Daniel Sarewitz (2002), H. Jonas) in academia advocate their personal positions on the subject claiming their grounds while both of the sides are challenged by careful empirical analysis. (Lie & Sørensen, 1996)

I want to enter this investigation in a heterogeneous Science and Technology study (STS) manner (red. Jasanoff, 1995) as it best reflects my intention of trying to bring together the sociological and technological science body (Pinch & Bijker, 1987: 17). The main principals of STS lies in understanding technology as being socially constructed and a matter of social negotiation (Pinch & Bijker, 1987:21), thereby technology is a product of social events and it can be altered by other social events.

Since I am trying to maneuver through a very controversial issue – I will conduct my study within *situational ethics* (Flyvbjerg, 2001:130) by being transparent in my theoretical and methodological opinions, relationships with stockholders and influences these and other aspects may have had on the elaboration of my investigation.

This investigation was conducted in tight collaboration with Skovhuset elderly home and rehabilitation center, which is an ambitious place where the staff puts an emphasis on implementation of welfare technologies for sustainability and the “art of nursing” (Martinsen, 2007:209) of the elderly.

I was warmly welcomed by the institution and offered a list of technological artifacts on different stages of implementation, which I was able to investigate. My interest was caught by the robotic spoon *Bestic*. Bestic is an eating assisting devise which recently entered the Danish market. Skovhuset has some experience with the older model of Bestic which had some technical limitations. In the beginning of December 2014, developers offered a new Bestic model, which was to be implemented and tested for future use. Skovhuset have offered me, as an anthropologist, access to observing the implementation and feedback documentation of this process. In return I offered contributions in the form of an anthropological user driven innovation study. I saw that this technology has potential, but at the same time as any new

innovation, it opens up for a great amount of uncertainties. In that regard it was hard to predict where the inquiry would take me. However uncovering and formulating those uncertainties is my academic passion. One of the most revealing ways of doing so, in my opinion, was an investigation through ethnographic participatory observation where the rich and descriptive data could be gathered (Flyvbjerg 2001:3; Birkbak 2013; Jensen, 2008).

I believed that this study could only be achieved in close cooperation directly with users: the residents of the elderly home and caregivers as it would give me the most valuable practical experience within implementation of the new technologies (Bjögvisson, 2006:104).

While inquiring into the subject matter I noticed a tendency, which I, for a while, had a hard time putting my finger on. Usually we draw a clear line between eating and feeding, but a problem arises when we consider how we should describe the process of a robot inserting the food in the mouth of a disabled person? Most of the articles on the subject are distinguishing in this process between the person eating or being fed (Martinsen, 2007; Bestic.se; WTA-it-institute). However Bestic is described as an eating-assistance device, so what does the person do when he or she gets this kind of assistance? It doesn't fit nicely into neither of those two categories any longer, therefore we are probably reaching a new ground of social construction.

I am eager to discover the new space that technology and practices are moving in to. We do not yet know what are those practices, who is doing them and how are they done. As implementation of technology is *"seldom purely technical-rational matter, but it challenges the existing working order and opens up conflicts about the redistribution of rights and duties"* (Vikkesø, 2007: 299)". Many things are up for discussion as we leave behind old and trusted categories such as distinguishing between eating and feeding.

The background

Bestic falls under umbrella term of *Welfare technology* – a term used mostly in North-European countries. It describes nursing *"technologies and services that can make working procedures more efficient and enhance the quality of life of elderly, chronically ill, and disabled people"* (ref. University of Southern Denmark). Social debate seems to attract great attention to the exponentially growing development of welfare technology in Scandinavian countries in general and in Denmark in particular (Birkholm, 2013). It is worth mentioning that a blossoming potential is actively supported by the government both financially and ideologically and based on a long and ongoing tradition of national health support.

"The Danish government has a strong focus on implementing what is known as 'welfare technology', i.e. technologies that can assist users in their daily lives and optimally provide a better work environment for employees while at the same time ensuring a more efficient provision of public sector services."
(The Agency for Digitisation/ Digitaliseringsstyrelsen).

Along with public attention comes a part in the debates on ethical, economical, labor market, human rights and other issues (Hofmann, 2013; Det Etske Råd 2009b). Even though I can't leave aside those matters I will try not to go in depth with the above mentioned and focus my investigation on the process of implementation and practices of use of a specific artifact: The Swedish produced robotic feeding spoon

Bestic Figure:1. “*Bestic can best be described as a small, robotic arm with a spoon in the end that can easily be maneuvered.*”(Bestic.se). I will try to describe the social construction that this innovation is interfering with.

As every innovation, *Bestic* has its history. Feeding devices are not a new phenomenon. The prototypes and working models of different sorts has been experimented with for at least the past fifty years. But I will focus my attention on the unique story of *Bestic*, a project started by a Swedish engineer, Sten Hemmingsson, who is suffering from complications from Polio. Polio is an infectious disease caused by the poliovirus and may cost muscle weakness resulting in an inability to move some or all limbs but not damaging the cognitive functions of the patient. Some years after his recovery from polio Sten adopted one of post-polio side effects - the numbing of arms. Among other things he gradually developed a need for eating assistance. Sten sees eating as an intimate and at the same time a very public matter (bestic.se), he wanted to be in control of. He engaged himself in the process of developing a device which would give him some of his autonomy back. It took seven years to develop *Bestic* and it was done with help from the Swedish Institute of Assistive Technology and various private companies. Today, *Bestic* is a CE-marked (certification for the European Economic Area) product for technical medicine. The significant participation of a passion-driven engineer greatly influenced the development of the device, giving a valuable insight into the needs and nuances of direct users. (ref. *Bestic* home page, bestic.se) However I will argue that it also made it “tuned” to the specific type of disability. Whether that tuning is transferable to a great variety of patient of all sorts, mental and physical disabilities, seems to me be an open question. (Oudshoorn, 2004: 1905)

The other aspects which developers could not predict while designing *Bestic* was how it appropriated (Silverstone, 2012:21). Whether it would be used in a family or nursing home, and that the caretakers are just as well users of the innovation. As with any other activity feeding does not exist in isolation, but within vectors of already established culturally defined concepts (Lie & Sørensen, 1996: 10). *Bestic* is not “just” an eating device, it is also a new set of practices, which will have to prove themselves against and above old ones. (Shove, 2005:45) *Bestic* has existed on the Danish market for little over a year and obviously a study have yet to be made on the subject. The original home page proposes only very general descriptions and instructions for technical use and no information what so ever on recommended implementation and practical use of it.

A lot of questions arise in that regard: What can *Bestic* actually offer? What type of patients is it suited for? What are practical, ethical advantages and disadvantages related to use of the *Bestic*? How would it practically fit into everyday routines of patients and caretakers? I will not be able to answer all of those questions through a single study. My goal is to create a more constructive way of treating given technology by describing the practices it interferes with. Also, I will try to outline directions of some practical misconceptions related to implementation of *Bestic* in social institution; and thereby gain a more realistic picture of its abilities and limitations.

Combining these ambitions I can formulate my research question as:

How can the implementation of Bestic be improved, based on an analysis that retails the original design assumptions with an anthropological study of the introduction of an eating assistance device in an elderly care institution?

What is Bestic?

“Bestic can best be described as a small, robotic arm with a spoon in the end that can easily be maneuvered.” (Bestic.se) The device is constructed of a base, on which a small display shows a menu, mobile tower and spoon-arm. Arm has a replaceable spoon attached at the end. A special high bordered plate which can be bought in a few different variations.

The controller is a significant part of the arrangement. It can be purchased in several variations to accommodate different types of physical or cognitive limitations of a disabled person i.e., joystick controller, feet controller, button controller, one-action “pico button”. That way the controller is in reality the most unsettled and experimenting part of the device.



Figure 1: Bestic and seven available controllers

That is the way Bestic is characterized on the official web page:

“Bestic is small and compact, has an attractive, discreet design and is very quiet which makes it blend into the dining environment in a natural way. Bestic is easy to use, flexible and most importantly, controlled by

you, the user. By choosing a suitable control device, the user can independently control the movement of the spoon on the plate and choose what and when to eat.”(Bestic home page)

Taking as point of departure a statement formulated by Bestic I divided the approach of my investigation into a list of exploratory questions created on base of key assumptions:

How does it ‘blend in a natural way’ in practice?

What Skovhuset employees and residents think natural environment is? What it means to “blend in” and how it is done in practice? So for something to blend in in natural way will need to have sorts of compliances. What are the other artifacts? The ongoing practices it has to blend in to. Designers can’t know what the ongoing natural practices are in specific elderly homes in Denmark, as institutional environments does matter (Shove, 2005:55) I will outline the routines and practices Skovhuset has towards artifacts.

How does Bestic functions?

Manufacturers provide the users of Bestic with a descriptive manual and insures that “it is easy to use”. I want to investigate what does it mean within everyday practices. Users are all people coming from different social backgrounds, and with different cognitive and physical abilities. I assume that it vary how familiar a person is with technological artifacts as well. What does it literally require to use Bestic? The other side of the “use” of artifact is what is going on, besides the direct interaction with software and hardware. I intended to uncover what other aspects may be involved in the practice of usage of Bestic.

What is ‘the dining environment’?

On the home page it is stated that: *“With Bestic on the table you can enjoy your meal in your own pace and on your own conditions.”* But how would it function and influence an eating situation in a public or semi-public (elderly center) place? Bestic provides an article called “Five Aspects of a Meal Model”. It is a guide to meal service in commercial dining environments. This article reflects on the social construction of dining aspects and includes descriptions of: Management control system, dining room, the meeting, products (food) and atmosphere (Inga-Britt Gustafsson, 2006). Since this article is made for restaurants, I will try to investigate how applicable it is for the care center and what stands behind those descriptions.

What is the role of the caretaker?

The company proposes the idea that: *“It is up to the user to control the assistive device and decide what parts of a meal to eat and when to eat them.”* Autonomy and flexibility are postulated as some of the empowering applications of Bestic. I want to investigate in which way the role of the caretaker and the resident is altered and in which ways they are empowered or disabled.

Who is Bestic design for?

Who are those who can and will benefit from using the device? *“Engineers, and other actors involved in, the design process, configure the user and the context of use as an integrated part of the entire process of technological development”* (Oudshoor, 2004:31) On the Bestic website the potential users of Bestic are described as *“persons with different neurological diseases”*. Moreover Bestic has a certain range of flexibility, as it *“can also be adjusted for each individual user by choosing a control device suitable for specific needs e.g. buttons, joystick or foot control depending on the need of the user.”* A brief explanation and a list of diagnoses of the ones who could benefit from using the Bestic is also available on the site. However in the situation of institutional caretaking I see two groups of users: primary users - the disabled person who would eat with Bestic (or other assistive devices) and the secondary users - the families, caretakers and so on. I intend to inquire into what this do to the in-act in practice.

Summary

I will try to unfold reflections on those questions through the various collected empirical data, as different social groups will most likely have interpretations of the technological artifact. (Pinch & Bijker, 1987:41). I will elaborate on physical design matters as well as social construction processes around Bestic, along with taking in consideration recent research on the topic of assistive eating.

In order to come up with statements about Bestic designers have made research, taking into considerations some of the issues in the eating process, or as they called it: *“the methodology behind eating”*. This was a laudable initiative from their side and surely gave some important design insights which surely helped make the device quite a success today. Apart from that, findings are based on very locally grounded meanings from Sweden and may not fully apply to social constructions in other countries and circumstances and they may only apply in a limited degree.

With this investigation I want to contribute other aspects of eating practices which can be learned through the anthropology-driven design methods (Christensen, 2013:385). This will give us a deeper understanding of users of Bestic, then that the Bestic AS may have had. I want to explore the other nature of challenges they may face; that I intended to achieve through an ethnographic case study.

Theory

I intend to investigate how I can contribute to further improvement of the implementation of eating assistance devices, based on the relation between its original design assumptions and an anthropological case study. Therefore I will describe the process of an artifact, Bestic, entering a social construction at an elderly center, Skovhuset, and thereby discover which social groups are directly and indirectly involved in that process. As soon as Bestic enters the local routines, it will be interpreted in certain ways and start to be part of the social construction of Skovhuset. As there is a multitude of ways of designing artifacts there is no single way of using and understanding them. Every social group would create its own meaning, which might be quite different from others (Pinch & Bijker, 1987:40-41).

Key concepts

Social construction of technology (SCOT) in its turn represents a social constructivist approach which “must be addressed analytically and empirically” defining meanings of social construction (Pinch & Bijker, 1987:17). Here we see a social construction as that which emerges in the use of an artefact in a certain social group. It is the social world that gives meaning and thereby socially constructs the artefact. When I talk of an artefact entering a social construction, I lean against Pinch and Bijker’s (1987) understanding of a social construction, which is the construction of social groups. When analyzing problems in relation to social constructions, we place an artefact at the center of it, and define the relations of the social groups making up this, in their means to come to closure. Identifying their problems become an analytical step, where you look at one social group and the relation to its problems (Pinch & Bijker, 1987:35).

Since technological artifacts and society are mutually constructed, I need to look deeper into the ways of how those constructions are done (Lohan, 1996). Illustrations of “technology as a heterogeneous constituent of society” (Lie & Sørensen, 1996:4) can be found in Domestication theory. It developed from anthropology and consumption studies and investigates how exactly to “tame” the technology and to fit it into everyday routines (Haddon, 2011:312). A framework of Domestication was articulated by Silverstone and Haddon in the beginning of the 1990’s and was a reaction to a technology-centered take on product development. It investigates how people fit technology in everyday life and why it sometimes gets rejected (Haddon, 2011). Domestication theory is a useful tool to illuminate the practical sociological issues of implementation, as it shows the ways to investigate artifacts. It has another useful perspective on how artifacts are defined and placed in the ways which may imply redefinitions of routines (Lie & Sørensen, 1996). However Domestication is not showing much concern about the discussion of how artifacts are appropriated (Shove, 2005:62).

Practice theory can be viewed as a next logical step of investigating more or less established practices, as well as illuminating the aspects of “encompassing account of co-production of practices” (Shove, 2005:62) – the illustration of active role of the user in the development of the invention. It is important to describe all elements of the practice as it comes together as “Product by itself has not much value if not included into practice and allied to requisite forms of competence and meaning” (Shove, 2005:57).

I have a strong interest in active user position where not only elderly center residents, but also the institution and staff are seen as users of the technology (Friedman, 2013:348). The Practice theory is a tool to describe the development of practice and how practices are shaped by actual, potential and previous practices as well as products. (Shove, 2005:62)

When looking at design assumptions of Bestic, I rely on Oudshoorn's (2004) understanding of the production process of an artefact. I want to understand how technological artefacts are produced, and through this incorporate barriers between different social groups. The designers of an artefact imagine a future user, which influences the production in the way that the technology will be adjusted to certain imagined user groups (Oudshoorn, 2004:31). To get behind the design assumptions, which are based on an imagined future user, I analyse different material from Bestic.se, interviews with the designer etc. "Engineers, and other actors involved in the design process, configure the user and the context of use as an integrated part of the entire process of technological development." (Oudshoorn, 2004:31) By user configuration I understand inscribed scripts in the artifacts. Previous theory, such as domestication, are primarily concentrated on the technology-in-use approach (Oudshoorn, 2004:32). I think that another side has been neglected and I want to illuminate this as well by use of the concept of script, the inscribed use of technology from the production, designer side. More precisely a script can be understood as that which is embedded or inscribed in the artefact, as a certain way of using the artefact in a certain situation (Akrich, 1992:2).

Theoretical landscape

In the study I find my theoretical base in the general science and technology study (STS) approach. STS gained popularity and established itself in the early 1980's (Bowden, 1995:71) and later STS divided into various theoretical branches. I will not mention the whole list of representatives but only briefly the most explicit and relevant for my inquiry, later these positions will be discussed when relevant. The feminist perspective within STS (e.g., Donna Haraway, Lucy Suchman, Maria Lie & Knut Sørensen) has mainly contributed with rethinking issues of gender, subjectivity and victimization, the latter will later be taken into consideration in the analysis. Another prominent approach within STS is the Social Construction of Technology (SCOT) approach. This approach is socio-constructivist, meaning that the world is a social construction (Pinch & Bijker, 1987:17). In contrast to the SCOT approach, the Actor Network Theory (ANT) approach conducts inquiry in terms of describing heterogeneous relationships of actions (Law, 2009:141). It has criticized the SCOT approach of being human-centered.

Some of the authors contrast quite radically to Tommaso Veturini - who is representing multisided ANT cartographic-ethnography (meta-ethnography) by mapping controversies (Veturini, 2010) – e.g., Lie & Sørensen (1996) who does situational analysis of case studies with an feminist SCOT approach. There are ontological differences in the discourses of analytical and empirical approach to inquiry (Pinch & Bijker, 2008). However my intention is to benefit from socio-constructivist as well as constructivist perspectives, letting them complement each other. As borders between studies of the two types are often indistinct, interrelated and actual differentiation is not always clearly defined (Pinch & Bijker, 2008:XV).

I intend to focus on the epistemological claims, and apply the perspective of "epistemological relativism". In the grounds of my study I will propose epistemological and not ontological criterion (Pinch & Bijker

2008:XXV) by taking a socio-constructivist's perspective and supplementing it with perspectives of authors within the constructivist field.

Contextualized knowledge

During the research I was performing as an observer and at times as an active member of discovering implementation possibilities of Bestic. From that perspective I saw my involvement as dynamic enactment of both practical and "scientific practice as an active construction of the world" (Vikkesø 2007: 300). Being in the middle of that practice the natural way to enter the field of study was as a participating observer.

I took initiative to enhance dialogue within different social groups without reducing the dialogue neither to pure episteme (i.e., scientific analytical knowledge) nor pure techne (i.e., technical knowledge or know-how) (Flyvbjerg, 2001:2). That means that I did not try to promote theoretical perspectives, nor did I try to present some tangible-technical solutions. That is instead of giving a purely or isolated technical investigation, I wanted practice a kind of Aristotelian phronesis, meaning that I wished to relate both theoretical knowledge in my field to the everyday practice of the institution. Hereby my investigation was more than a tangible-technical solution, rather a contribution that enabled an element in the particular to be raised to a more general level.

I needed to come closer to representatives of different social groups and ground context-dependent knowledge (Flyvbjerg, 2001:71), the kind of learning process which can be created through case studies. Applying contextualism (Flyvbjerg, 2001:130) it is important to have close personal contact with the object of study. That is the process of implementation, in my case study, as the "greater distance ... and lack of feedback easily lead to a stultified learning process". I believe that "social science ...can only provide context-dependent knowledge and the case study is especially well suited to produce this knowledge" (Flyvbjerg 2001:72).

Ethical takes

In regards to the technological side of the process, I would like to refer to the "theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner" (Friedman, 2013:348) – namely the Value Sensitive Design. The main idea of Value Sensitive Design is to address design issues by emphasizing the ethical values of direct and indirect stakeholders (Friedman, 2013:348).

I perceive the ethical values of the stakeholders as a weighty variable in an inquiry, in regards to care systems. Implementation of new eating assistance devices is shifting some already defined understandings of autonomy, care for the elderly, and other aspects (Hofmann, 2013). That shift may cause challenges in understanding feeding normatives (Martinsen, 2007:212). Here I want to emphasize, that it is neither my intention to criticize the current situation of care taking nor disfavor welfare technology, rather to understand the principles and grounds of its social constructions.

Method

In this section, I want to discuss in more details the tactics of the investigation as part of knowledge creation. It might appear not much of a theoretical perspective but as ethnographical - *tricks*. It is a way of approaching ethnographic investigation in order to make sense of the data. Tricks are helping to formulate new questions based on what is found and get all the good sense out of the data besides the most obvious ones. (Backer, 1989:5)

I describe my research as a micro-ethnographic case study. Micro-ethnographic as it was done in a relatively short time of three months and I will describe a single social situation or rather 'a single social construction': The introduction of an artefact (Spradley, 1980:30). That process showed to be much more complex than I initially expected and involved actions and social groups, I was not aware of would come in to play.

Getting access

The way I describe my inquiry is as a case study. Flyvbjerg claims that "*case study produces precisely the type of context-dependent knowledge which makes it possible to move from lower to higher levels in the learning process*", where the lower levels are more primitive, based only on theoretical knowledge. Which is of course a valid step to take, but it would not give the ability to use the knowledge in practice. (Flyvbjerg, 2001: 71) In my understanding of it, Flyvbjerg proposes a verification and need of a case study. To make reflection on my current project it will be the difference between making KL annual general welfare tech. satisfaction review and actually interviewing caretakers and observing how practises occur. That is why I am interested in shadowing the nurses, participating in meetings and in any way getting closer to the process of practise creation.

In that regard the level of accessibility plays a significant role of entering the empiric investigation (Spradley, 1980:47) as it illustrates the role and place of relations in the social construction. When I approached Skovhuset in January 2015, I got an instant reply and the next week I found myself sitting at the introductory meeting for the Bestic. The meeting included the presents of the head of Skovhuset, physiotherapist, nurse-development coordinator, nurse-coordinator of eating technologies, 2 master students and a representative of Hillerød Kommune. We got strategic planning print-outs, we were allowed to do audio recording and take photos during the whole meeting. It gave a strong impression of transparency and well established intercommunication within the care centre as well as with authorities.

Data gathering

All in all I gathered data which falls into four categories: semi-structured interviews, shadowing, participatory observations and "casual conversations". I have purposely put conversations as a category by itself as it was a valuable data source which happened in that "in between" time. A lot of accumulated valuable data occurred in the hallways and in the common areas of the nursing center, where ever it

happened to stood up into someone from the staff and asked practical questions. It usually ended up with remarkable professional and discussions. These casual meetings happened before and after meetings, visit of residents and alike. Sometimes employees and us researchers stood there for some time discussing topics related to the Bestic, Skovhuset and possible academic takes on it. An important part of my reflections on empirical data as well as partly the way of collecting it, was with the other AAU student. That collaboration was a quite productive analytical method. We both were eager to share observation details, personal interpretations and theory appliance while formulating ideas for each other.

I will use the method of *thick description* (Geertz, 1976) to illustrate the inquiry with my own interpretations in the context of given social construction. The process of introduction of Bestic both represent cultural nuances and take part in forming the social context of caretaking I was witnessing at the elderly center.

Home-work environment

My intention was to explore daily routine of nursing center Skovhuset, in order to “observe cultural change and stability” during implementation of new technology. Domestication theory in contrast to the large national quantitative investigations (KL) represent locally embedded case study (Lie & Sørensen, 1996:2), which is also my field of interest. Lie and Sørensen (1996) have used the description of case study in terms of *everyday life* (Lie & Sørensen, 1996:2) where local context is important (Lie & Sørensen, 1996:15).

The work and private space blend in to each other, within the construction of Skovhuset center (Hjorth-Hansen, 2002). It is hard to define difference in use of welfare technology as work means: where one have to perform given tasks, or non-work means: where interaction with technology is ones free will. However I see no problem to describe nursing home routines as unity of everyday live processes. In a theoretical approach of *Domestication* (Silverstone, 1992:2) everyday life term refers to the routine activities of technology appropriation.

In this inquiry I used some webpages as source of qualitative data in their own right (Bryman, 2012:654). I am aware of vast information possibilities on which can be found in the internet and aware of implications of fluidity of on-line information and screen shots of the referred document can be found in the appendix. However, I will appeal only official sources, which are not pure informational, but are a reflection of existing documentation as Danish national Agency of Digitalisation and Digital institution report.

An important insight of assistive eating devices implementation are states founded institutions that were given an assignment to investigate the topic. Local Government (Kommunernes Landsforening-KL) for example, performs yearly status measurements in form of questionnaires, the IT-institute made a large investigation in year 2013-2014 of another eating device. Even though the technological solution of those two devices differs, I believe some overall description can be a great help in the investigation of techniques of eating assistance, as common practical problematics are shown and recognized. Moreover the Welfare Technology Assessment model (WTA-model, Figure: 23) which is developed by the IT-institute and used in the validation of their reposts is also used by the Skovhuset administration. The WTA-model lies in basis of negotiation for further implementation of eating devises (Head of the Skovhuset). Therefore I found highly relevant to include as supporting reflections. I will take those considerations in account, in order to reflect on implementation process in Skovhuset.

So how much do we know about assistive eating technology? The WTA report has a very interesting empirical approach, but my consideration lies in the way it summarizes the findings that in my eyes runs sometimes against some of the other report statements. There are some remarkable observations on the table which as I see it needs some further investigation, as they left with no clear conclusion. There are not much description of the reason why some of the participants dropped out from the process and whether it was in any way coincidence.

By analysing the Bestic home page as a part of academic work (Bryman, 2012:654) it is apparent that the company was trying to, from product development view, to make “an effort and worked intensively to understand exactly the methodology behind eating.” However, the research questions made by Bestic are carrying mainly practical characters as: “What do we really do when we eat? Which pieces do we select from a plate? How fast do we eat?” and so on. Clearly, the intention was to easily translate them into technical solutions in a user-centred approach (bestic.se). I would like to offer the other socio-constructional aspects as how to make sense of technology in everyday routine in nursing home Skovhuset. (Lie & Sørensen, 1996:17)

Doing ethnography

Spradley’s Handbook on participant observations was a great ethnographic tool used in this study. However, while Spradley describes the reasonable step-by-step working process of how to collect and organize the empirical data in a flexible way, he contradicts STS in some basic epistemological views. Therefore I was not able to use his analysis methods. Spradley is representative of a more classical modernistic take on writing ethnography, where the researcher is looking for discovery or “*unsilence cultural patterns*” (Spradley, 1980:39). My research is directed towards capturing the shift and construction of some practises and how the environment deals with that (Lie & Sørensen, 1996:1). That way I choose to structure the analysis and the rest of my inquiry in form of collection of interpretive understandings from different social groups. “As both answers and questions should be discovered in the social situation being studied” (Spradley, 1980:32). The intention is to discover the aspects, which are taken for granted and by illuminating them and gain knowledge.

Ethnographic record

An ethnographic record is done by a logical continuity of the ethnographic observations. After every field work I was doing notes and descriptions, formulating a short list of discoveries, breakthroughs or frustrations.

In every next observation, I looked for answers created by previous ones. (Spradley, 1980:32) This guided the answers into a more focused direction.

The following steps could roughly describe it: general descriptive observation - the first impression of Skovhuset. Then it was narrowed down to focused observations of practises of eating and nursing in the care center, and then selective observations of practises of implementations. That way the ethnographic record is helping to bridge descriptive observations with the analysis (Spradley p.33).

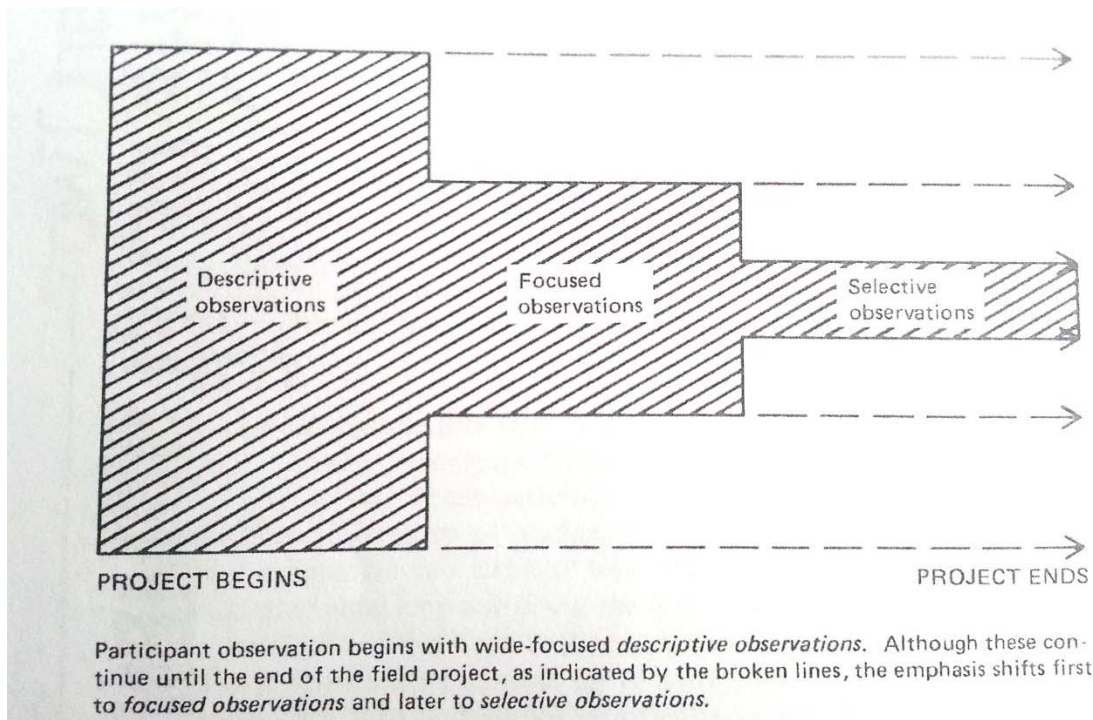


Figure 2: The graphical representation of in changes in the scope of observation.

As students we were offered unreserved tables at the physiotherapist office. As a rule after a meeting, shadowing or other ethnographic activity we would go there for discussions and making notes, which was a great opportunity being able to work and still be present, as a part of the environment. It was a great chance to fall into a conversation with employees and residents and to do ethnographic record right away.

In this paper I also want to touch upon an uneasy question of “How to mediate gathered empirical data”. I will try to elaborate on that subject with help from the book of Bent Flyvbjerg (2001) “Making social science matter”, from a more theoretical-conceptual perspective in attempt to elaborate on how to contribute as techno-anthropologist.

It is uneasy but a common issue and a significant subject to discuss. My seeing of it is that one should be very careful of making unrealistic promises and rise high expectations. As I am going to do an academic exercise, my agenda in the higher degree is to follow the desired inquiry description of an ethnographic observation and meeting the university regulations. However, I would also like to make a directly valuable contribution to the Skovhuset. As I am aware of that by agreeing on collaboration, I set their expectations for some benefit of my work.

Analysis

This investigation was made possible through a close cooperation with the elderly care center, Skovhuset. It was not a purely coincidental choice from my side, but a result of their history from previous cooperation with Aalborg University (AAU), whereat I am currently a student.

Skovhuset positions themselves as a pro-active institution and holds a liberal attitude towards academic involvement (appendix 8) as well as the use of welfare technologies. I should say that it is not a common attitude in social institutions where some feel very vulnerable and running a risk of being exposed to negative critique (Nickelsen, 2013:9). However, Skovhuset has benefitted from their open minded position. It allows them to get useful research input, as well as supporting their reputation as a front-rank care center (appendix 9).

I learned that up to now the institution had been conducting an implementation study of Bestic, by their own means. Their intentions had been to figure out what limitations and nuances the use of the eating device presented them with. The next step in the implementation had settled on the introduction of the eating device to a selection of elderly, who supposedly would benefit from using it. The practical experience of that process would contribute to the description of further Bestic implementation. It was this phase in the process, which my study was involved with.

When I first heard of the implementation of the eating device at Skovhuset, and made a quick survey: watching commercial videos, reading articles and the WTA report (Gaedt, 2013), my imagination have drown the world where there are citizens sitting by the table enjoying their meals by use of the eating robots. Yet things were not quite that way. I was aware of the *messiness of reality* (ref) that I would face when comparing this to reports and commercial videos. However, I was surprised to discover that some of the problematics that arise in the implementation of such a devise, are much more basic and lie in other places than was mentioned in the articles and press releases (Gaedt, 2013, GSS, 2013). I realized from the get go that my ethnographic study was going to be partial and incomplete, but at the same time it was a way *“to discover hidden store of knowledge gained during the research process”* (Spradley, 1980: 160).

A nuanced perspective on Skovhuset as an external partner

I shortly introduced Skovhuset earlier in this report (introduction). My intention here is to nuance some of the aspects of approaching it as an external partner. Skovhuset had moved 2 years ago from the old fashioned institution *“with the long dark hallways”* (head of Skovhuset) to a high-tech custom-build nursing center with large windows, handicap accessible bathrooms, electric locks, safe floors¹ and so on (Virksomhedsplan, 2013). Skovhuset is a mixed - of home-instruction environment (Hjorth-hansen, 2002), where residents are renting their living spaces, having a lot of freedom but still are part of the care system.

¹ Secure sensor-coated floor that for example can detect and identify if a resident has fallen on the floor.

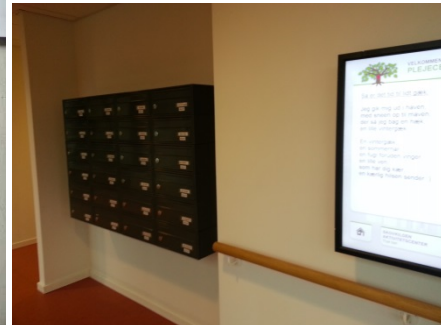
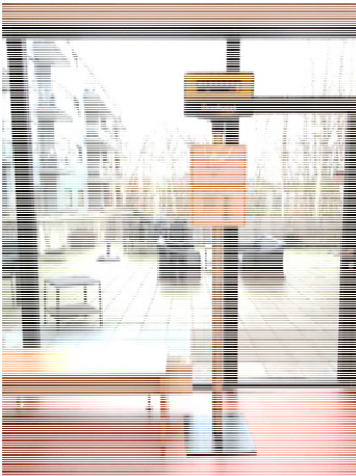


Figure 3: The hallway with an entrance to the outdoor terrace

Figure 4: Intro brochure, name tag, and electronic keys.

Figure 5: The hallway with interactive activity and events noticeboard, mailboxes.

Skovhuset showed to be in a high degree horizontally managed organization (Skovhuset). Skovhuset holds morning briefings (where the centre leader participates), three daily unit-status-meeting, regular welfare technology representatives meetings. The welfare development group is built of different administrative levels on equal rights. Above that, I often witnessed employees just coming by, regarding some practical issues. The glass-doors to the offices were never closed and in general, there was friendly mingling atmosphere among the employees just as well as among residents of Skovhuset. The general attitude towards the residents was: To make a nursing center a home of residence, not an institution (Hjorthansen, 2002). This attitude plays an important role in the resident's everyday life and their attitude towards implementation and acceptance of the technology which I will discuss later. To illustrate this vision I will examine statements from Bestic home page and will try to challenge presented explicit and implicit design assumptions, I described earlier in the introduction, by means of ethnographic study.

Implementation process

For technology to gain acceptance it has to be a part of everyday life and be practiced on daily basis. It is re-ensuring for our meaningful social construction of an artefact to see it being practiced by others (shove 2006: 53; Lie & Sørensen 1996:17). That way the artefact can create acceptance as I discovered it was an issue for the elderly. However the eating technology is a quite new phenomenon and it had not yet established a routine of reproduction (Shove, 2006: 44). It have been introduced only little more than a year back and has not been used in the last half year as there was no fit candidates and the process of introduction was presieved as a resource demanding task. The challenge for Bestic from this perspective is to be Domesticized - to accommodate to existing social and technical systems.

Due to the wide experience of Skovhuset with other technologies they worked out some of the introduction strategies. These included a step-by-step program for familiarizing the residents with the artefact. That strategy helps to accumulate acceptance to the possible change.

Resident visits and Bestic introduction

When the three test persons were selected for the introduction of Bestic, talks with caretakers was the next step. Skovhuset supports the idea that the day schedule should be made by the terms of residents (Hjorth-Hansen, 2002). That way, wake-up time and breakfast are adjusted to the preference of individuals. Caretakers are a invaluable link in the process, as they are the ones who have direct contact to the residents on a daily basis. Caretakers gave feedback on how the condition of the residents developed during the day, some details about their eating habits and when it would be most suitable to approach each person for a talk. For confidentiality reasons I will refer to them as resident A, B and C.

That was an attempt to introduce the eating assistance device in the least stressful manner, and if not a natural then at least in a respectful way (Homann, 2013:389).

The first visit of the residents was planned during noon, as there would be a higher chance that selected persons were done with their morning routines, such as toilet and breakfast, and they would still not be too tired for a talk. (fig.8). In a group of three we, the techno-anthropologist, the sustainable designer and a physiotherapist, approached the living unit of a selected resident, in this case A. The living unit is a dorm-like room, with a personal handicap toilet², tea kitchen and a large living room, which usually is divided into bed and dining areas.

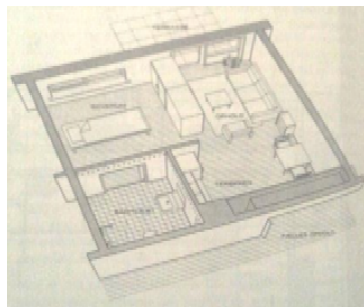


Figure 6: *The first presentation of Bestic for the resident A*

Figure 7: The resident B. room interior

Figure 8: Illustration from the book "From nursing home to living environment"

During the first visit we hardly unpacked Bestic. The main effort was directed towards getting around the idea of using the device. Observations and recommendations of the caretakers empowered physiotherapist, who was responsible for the introduction at that stage, to gain easier contact with users by saying things like: *"I know that you are getting tired by the end of the meal"*, *"I know that you like eating soups for lunch"* and *"sometimes it is hard for you to get the spoon right into the mouth"*. Those statements helped to create contact with resident and act more engaged and in control of the situation. In about 15 minutes of conversation we agreed to come back in a couple of days, so the residents could think it over.

It is an illustration of how much effort it takes just to get residents acquainted with the thought of some change in their everyday life and what it would mean for them. I believe it isn't a unique situation for Bestic, and the scenario would probably be quite the same with the majority of innovations (Haddon,

² A bathroom designed in the special way, with easy access to the wheelchair and other welfare equipment.

2011:312). Surely with some differences, but innovations need some time for adaptation. And it might end up being a lengthy process if user doesn't immediately see the meaning of the innovation or are unsure about it. (Shove, 2005:58)

The complexity of the situation involves the long history of feeding as a part of care taking (Martinsen, 2007:209). From that follows that, when you change elements in the practice of feeding, it will have to be deconstructed, re-established and reconstructed in a new form and that might create tensions (Lie & Sørensen, 1996:7). My intention was to investigate how innovations can be adopted and what challenges it will pose.

How to 'blend in a natural way' in practice?

The statement from the Bestic pronounces that: "Bestic has a unique form, designed to fit into the table environment: It is slim, has soft movements and is silent and blend in a natural way." That statement made in a great reflection to the marketing principals and tight collaboration with highly professional robotic-designers (robotdalen.se). Moreover, there are some serious engineering thoughts backing up that idea (bestic.se). Just as described on the home page the device is silent, compact and has sleek forms. It works from rechargeable battery which makes it easy to transport and handle. However does it make it "attractive and discreet"?

The visual appeal of the device will have an influence on adaptation; however even though Bestic AB makes it a selling point to emphasize the visual appeal of Bestic, I am proposing that the adaption process will be a lot more complex and ambivalent than it may be perceived at first, and certainly in no way reducible to visual and esthetical aspects.

However I want to make a point here by stressing, that "attractive and discreet design" as well as intuitive use is an important factor of new technology (Norman, 2002:4) and it undeniably will help on the way to full implementation. However who is to decide that design is attractive, as it may vary from the young person to the elderly one and even amongst these. And how does it help if it does not even get out of the bag?

Reconstructing a practice of eating

The practice of innovation pays an essential role as *"products alone have no value"*. *"They do so only when integrated into practice and allied to requisite forms of competence and meaning."*(Shove, 2005:57) The goal of Bestic is to overcome a possible phase of disclaim by creating new and positive associations. There are various commercial and organizational tools to create such a change (Shove, 2005:58), but it shouldn't be assumed that those meanings are present already.

Even though residents have seen and heard of Bestic by now it is not something one can just take out of the shelf and use. The use of technology is not a one-off experience. *"Technology changes the physical as well as the values and it calls for reflection"* (Hofmann, 20013:396). Even though residents have seen someone using it before this will not alone make it a general rule of reproduction, as for *"practice to endure and exist as identifiable if mutable entry, it must be continually repeated by those who do it"* (Shove,

2005:49). Since this is not the case at the moment a slow and easy strategy of approach is a valuable solution.

Going back to the idea that eating with Bestic is a practice which involves an active position of the user – namely “eating” it includes a several forms of compliance. From that perspective the resident can be viewed not only as user but also as an *“active and creative participant...of practice reproduction”*. (Shove , 2005:45) So by eating with Bestic we are simultaneously creating practices as well as being part of it. The physical inability and unwillingness of participants to eat with Bestic inhibits the process. Eating with Bestic is on its early stage, new links while created and old ones are challenged. *“Innovations in practice depend upon the active integration of elements, some new, some already well established, that together constitute what we might think of as innovations-in-waiting or proto-practices”* (Shove, 2005:48). In this light I am willing to propose consider eating with Bestic not as *a practice*, but as *proto-practice*, where we do have an artefact and potential user, however the practice itself is only about to emerge, but is not yet here.

The great challenge for Bestic right now, as a new artefact, is that it has not established its own niche and the *“links between materials, images and skills”* (Shove, 2005:58) have not emerged yet. New innovations have to “fight” against well-known conventional ways of caretaking, such as feeding. First, the prejudices and fears of a new artifact have to be broken for new symbolic meaning to appear (Shove, 2005:50).

How does Bestic function?

In order to answer this question I will go back to the statement from Bestic which proposes that: *“Bestic is easy to use, flexible and most importantly, controlled by you, the user.”*

The functionalities and configuration of Bestic

It is true that Bestic can be controlled by disabled person in various ways. Bestic gives independence in regard to picking up bits from the plate in a tempo controlled by the user. However there are other actions which have to be performed before it can happen. The preparation for the meal and cleaning up is also part of “dining”. From that perspective there are at least two users I have to take into account when analyzing the claim that Bestic is *“easy to use”*. There is a disabled person, who is eating with the assistance of the device, but there is also a caretaker.

To found a common understanding of how it works in practice I will start by giving a broad description of the main functionalities of Bestic. The eating assistive device, Bestic, consists of a main body the “tower”(fig. 9) and the mobile arm. To adjust settings as, such as the trajectory of the arm movement of Bestic, selection of user extension (e.g., if one has to use external joystick/controller (fig. 12)), a monochrome display which is placed a on the towers feet (fig. 12) is used. On the arm of Bestic is placed a metal spoon, which can be removed by clicking it off e.g., for cleaning or replacement with a slightly smaller plastic spoon. There are also an open range of possibilities for new cutlery designs.

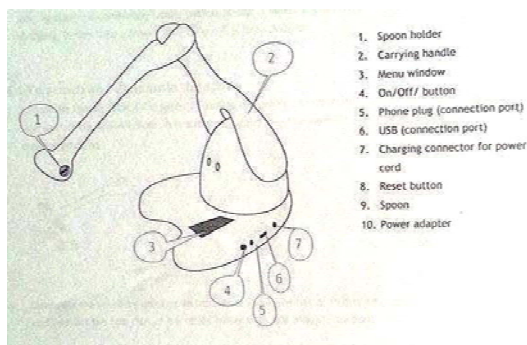


Figure 9: Bestic parts

Figure 10: Spoon food pick-up pattern

Being an active user of a range of electronic devices it took me a short while to read the manual and figure out how to operate Bestic. It was not a complex or sophisticated manual, but it required reading time. The busy work of caretakers would hardly allow that during dinner time, and some are just better to memories visually. Taking into consideration the early experience of Skovhuset and mobilizing local resources the responsible for the implementation, the physiotherapist, shoot a short introductory video. In order to top up the visual learning experience I proposed to make a “quick Bestic manual” that should fulfill certain criteria: have step-by-step explanations, graphical representations with very small chunks of text. The result of that work can be found in Appendix 10. These actions can be described as pro-active appropriations of technology for it to become domesticated – and have significance in everyday life (Silverstone, 1992:21).

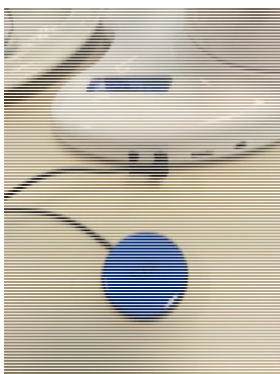


Figure 11: single-button -Pico

Figure 12: controller - Picasso

Figure 13: Bestic bag with accessories

The joystick/controller is also a very essential part of understanding the use of Bestic. It is a tool to adjust settings and control the process of eating with the spoon. There are some variations of controller designs to fit a wide group of disabled people (fig.1, introduction). Apart from practical difference in appearances of the controllers the functionality stays consistent. It essentially represents two types of steering: 1) the manual setting with a joystick-like controller (fig.12) 2) an automatic single-button controller (fig. 11). In brief the automatic single-button controller picks up the food in a preset pattern when pressed. The

manual controller offers the user more options for maneuver with Bestic arm. Manual controllers can pick up desired bits and make setting adjustments.

So when we are describing the functionality of Bestic we are not only talking about the “tower” of the device but also of its controller, the display, the special ceramic plate, the non-slip mat and all other parts of the artefact, which come into an assembly of artefacts creating the use of Bestic. The care provider needs to domesticate the welfare technology and learn how to use it, however the disabled user also have to learn how to steer Bestic.

The physiotherapist scheduled meetings with residents with some days apart as *“they have to have some time to think, but we should not stall the process for too long”* (physiotherapist). Unfortunately Resident A was not able to continue due to aggressive progression of dementia combined with complications following a stroke. The users have an opportunity to control Bestic via joystick, though it demands relatively well functioning cognitive and physical abilities, which was not present for Resident A.

Meaningful implementation

Resident B said that she was not really interested in the offer without giving any apparent explanation besides *“I don’t feel like it”*. This was accepted as sufficient reason to not go further with the introduction as a personal acceptance in regard to trying Bestic was highly important for the process.

The promotion point of Bestic is the *freedom* that technology offers the disabled person. *“It is up to the user to control the assistive device and decide what parts of a meal to eat and when to eat them.”* (Bestic.se). But the aspect of motivation is just as important, this is core in the meaningfulness of the action. The motivation to use an artefact gets stronger if actions make sense, the technology works without too many obstacles and results gives satisfaction to the user (Lie & Sørensen, 1996:7).

“Our ability to eat independently has a strong connection with our integrity and independence. This has also been our motivation when we have developed the eating assistive device Bestic. Our goal is that everyone who wants to eat by themselves should be able to do that!” Bestic.se

The goal is for the disabled person to see the eating devise as an indispensable symbol in the eating environment, as an integrated part of eating as such. This is also the main idea of Bestic and an attitude towards innovations Skovhuset adopted and used long before eating aids. Skovhuset for example have wash&dry toilets and additional aids made for persons with hygiene problems. Everyone who has those problems get the opportunity to have such a toilet, but only the ones who actively choose to have it will get it, as residents dignity and autonomy takes precedence to practical effectiveness. *“it should be the person who needs the aid and also wishes to have it”* (physiotherapist).

I describe it as *meaningful / sensitive implementation*, as there seems to be a difference between the situations in which people actively chooses to use certain technology, having his or her reasons to do so, and have someone else who wants to introduce the same technology and try to create an interest. In the second scenario much more effort seems to be required.

Luckily for us the third candidate, Resident C, was still happy to try out the new device. This time we met her in the common eating area. We talked about what kinds of meals she preferred to eat, and at what times. That was done in order to figure out how well Bestic would fit her diet, as unfortunately not all meals can be picked up by Bestic (Bestic.se). We placed Bestic on the table and let Resident C, try it out by pressing the Pico (i.e., the single-button controller). With a little practice she grasped the idea and proposed to bring some soup from her room. *"I left a little from lunch for us to try the robot,"* she said. Her engagement really touched and inspired us.

The physiotherapist had to have a couple of further talks with Resident C since, plans had to be made for the introduction e.g., time of the day of user, location, figuring out more about sitting position, and other practical issues of eating with Bestic.



Figure 14: Resident C is trying Bestic in the common area

Figure 15, 16: Replacement of the spoon

Figure 17: Bestic Rolling Stones is a foldable roller table

One of the issues was that Resident C had troubles reaching for the spoon, as her collapsed back was not flexible enough. Sometimes disabled people can't come close enough to the table because of physical conditions or specific body shapes, like large stomachs or partial paralysis (ref.). *"The regular table can be a problem, because Bestic can't reach all the way to the mouth. It is not even designed for it. Sometimes you have to use the hospital table"* (B. Tolstrup). A hospital table is a height adjustable, two footed table on wheels (fig xx). *"Sometimes it is even easier to adjust the height of the table rather than Bestic."* (physiotherapist)

It is a common practice that users, as active participants, use artefacts not exactly like assumed by designers and producers. (Lie & Sørensen, 1996:13) Domestications includes a likelihood for users to employ the artefacts in ways not intended by designers (Lie & Sørensen, 1996:11).

The choice of table, spoon, and controller should be taken into consideration and all of a sudden the use of Bestic lies beyond the standard manual.

In the Danish healthcare system the elderly people come to the nursing homes at a very high age, as there are multiple ways of supporting their lives at home and it is a priority to keep them at home as long as possible. A person at that age hardly has any technical knowledge and will struggle to figure out even

simple functions of technology. Therefore the adjustments end up being the work of the nursing homes. The most approachable way, when implementing Bestic, was as to be the use of a single-button controller (fig. 11). However by using single-button the spoon picks up the meal from the plate in a pre-set pattern (fig. 10). This makes the disabled person very dependent of caretakers presence to a higher degree than it might appear at first.

That means that the caretakers have to be responsible for the support of residents in the use of welfare technology (Brodersen, 2014). This in practice means that besides cleaning and serving the meal to Bestic users, they will also have to make all necessary adjustments. It might seem like a minor detail, but by implementing Bestic it is not just an artefact but assemblance of: dining area, table, meal, other residence, and size of the spoon. All these things have to be negotiated in advance or during the implementation process, which constitutes the construction of the practice of eating with Bestic.

Resident C made a remarkable comment regarding the situation of implementation of new technology. One day we came by and her old assistive walking trolley was not fit for her any longer. Resident C was offered a replacement which she hadn't yet customized for her needs and it needed some adjustments: technical as well as practical. Her reaction was very clear and forthcoming: *"Well this machine (Bestic) is just like my trolley: it needs to be sorted out and some getting used to"*. In a sense this is the very key to the domestication in the sense of "taming the wild" (Haddon, 2011:312).

"Each simple [object], but each requires it's own method of operation, each has to be learned [..]" (Norman, 2002:11). So if we know how to turn on Bestic, and do all the settings we are not necessarily done, as there are other practical things as what food to use and how to serve it, which spoon is best etc. We also have to learn every single detail of a part and place it in a bigger picture. The practices have to fall in to places and most importantly make sense to all parties. (Lie & Sørensen, 1996)

Summary

Looking at the Bestic practices I identified two direct users of the device: the person being fed and the caretaker. The process of eating also includes making and serving the food, cleaning up afterward. Seen in this perspective for an eating device to succeed it must meet the expectations and satisfy needs of both parties. The eating device should make logical and practical sense, to benefit both parties. I believe that it can be achieved through the right match of caretaker, disabled person and technology. It is not enough to be placed on the table to be part of dining environment, it needs to be continually reproduced as an integrated part of the practice. (Shove, 2005: 48)

What is 'the dining environment'?

It states on the home page that "With Bestic on the table you can enjoy your meal in your own pace and on your own conditions." But how would it work in a public or semi-public (elderly center) places? The Bestic provides an article called "Five Aspects of a Meal Model". That work is a guide to meal service in commercial dining environment. The work reflects on social construction of dining aspects and includes description of: Management control system, dining room, the meeting, products (food) and atmosphere

(Gustafsson, 2006). Since that work is done for the restaurant business, I will try to investigate how applicable it is for the care center and what stands behind those terms.

Bestic was designed for a so-called home environment or to “enjoy your meal in your own pace and on your own conditions” (Bestic.se). I can assume that there is a difference between eating at home “In the shelter of your own walls” and to being exposed to others in a restaurant or canteen. In this section I want to investigate what experience one gets from eating with an assistive eating device in a dining room at an elderly center.

On the home page of Bestic I found aspects, which may play a role in the perception of eating a meal by the dining person. The article, Five Aspects of Meal Model (FAMM), from which these aspects have been taken is aimed at institutions providing food, like restaurants and in my case care providers (Gustafsson, 2006).

The FAMM article is in a way to be used as a guideline for the commercial food industry in regards to identifying key aspects of meal serving which can with benefit then be translated to the health care sector, however with substantial interpretations needed. The significant difference in the social construction of dining in restaurants and at a nursing center is the indication of success. In the health sector consumption of nutritious meal will be considered as a positive result (Martinsen, 2007) in contrast to a restaurant where the idea that “dining is a symbol of social differentiation” is prioritized (Gustafsson, 2006:85). The diet is not part of the reflections in the FAMM study, but consists of reflections on a more general organizational level. Other major difference between FAMM for restaurants and care centers would for example be that going to a restaurant is an active choice whereas dining at a nursing center is more of a passive choice, even though both could be argued to be volitional acts.

With that said the article touches upon some very important and grounded rules of meal serving in public places, which are more directed towards the institution than the disabled person (or dining guest). Five meal aspects reflect on how, where and what is served to the customer and is framed in terms of: room, meeting, product, management and atmosphere (Gustafsson, 2006). I will illustrate the validity of these aspects by an example from my observations.

“[Bestic] blends into the dining environment in a natural way.” Taking this statement as a starting point, I will try to elaborate on which other kinds of meal aspects there are and how they will be interfered with by assistive eating device. One of the aspects which are of importance to locate within the environment of the elderly center is the understanding of duality of space. For the residents of Skovhuset the space is their home where they get involved with everyday activities and for employees it is a place of work. That combination can be described as a hybrid space of both work and home and requires multiple-use practices and can become a challenge for design solution. (Brodersen, 2014:6)

The building of Skovhuset is shaped in such a way that the administration area is in the middle of the connected buildings and the residential area is in the wings of that composition (fig. 20). While we were told that the building was provided with a whole range of practical hi-tech solutions and gadgets the “homely” atmosphere was an important issue. Not forgetting that it is a place for elderly the 1960’s style sofas, the embroidered flower paintings, and the “pool pub” (fig.18) was helping to create a recognizable

environment. It gives space for being “old fashioned” that makes Skovhuset look a little less of an institution and more of a home.



Figure 18: pool-bar in common area



Figure 19: Dining atmosphere

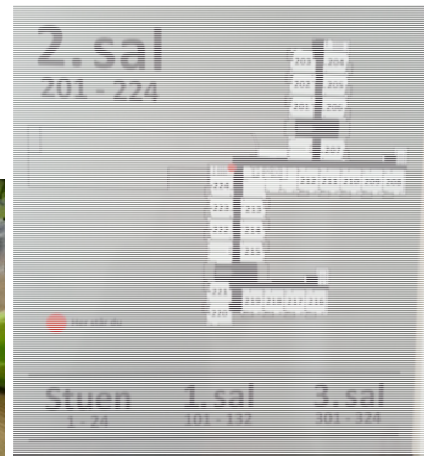


Figure 20: Building plan of the Skovhuset center

Within the framework of implementation the next step of the introduction was to try Bestic in the dining situation. Physiotherapist made an agreement to join Resident C for her dinner which she was usually eating in the common area. The meals are typically served around 6 p.m., where unit residents are gathering around one table. Every resident unit has its own little community consisting of 12 residents, with whom they make friends and do activities. “We have been living here for so long, that we know each other. We are like a family.” (Resident C) At the dining scene everybody has their own reserved places at the table, so that when we arrived, we asked for permission to join the dinner and take available seats. “It is important you treat them [residents] as hosts, as it is their home” (caretaker). At Skovhuset the elderly decide their routines such as distribution of sitting places, whether to eat in common the area or at the apartment. Personal repetition of actions, “signifying stability and reproduction of social patterns” (Lie & Sørensen, 1996:3), constitute the social construction of the dining practice.

The room

According to the FAMM article the “room” wherein people are dining also plays a valuable role and can influence the meal experience. I believe that even though a nursing center is not a typical home environment but a much more complex social construction, where more structure and administration is required, it is still “home” for their residents. Reserved places, cotton curtains, colorful napkins and other knick-knack (fig.18,19) are part of creating the room residents are eating in. Small things can make a person feel comfortable and “homy” (Brodersen, 2014); just as a sterile white hospital-like design might have negative associations and influence on the dining experience (Gustafsson, 2007). From this perspective the looks of Bestic stands out from the dining environment and draws attention. We probably can’t “homify” Bestic itself, as its design also has functionalities e.g., cleaning, but we can “homify” the environment it is used in, so it doesn’t feel that alien. (Brodersen, 2014)

The product

The dining situation we were participating in took place in the evening. The residents were served backed root vegetables with beef roast. The food was warmed up in the little kitchen, connected to the common area from where one can smell the spices and freshly made food. It can be categorized in the product aspect (Gustafsson, 2006:86). The FAMM article proposes the idea that the looks and taste matter: - the social act of eating and a nicely served meal can stimulate the appetite - (Gustafsson, 2006:86). The challenge of eating with Bestic will be to take into account the eating preferences of the resident. The WTA-rapport showed that most of the time assistive eating devices are used for evening meals (Gaedt, 2013:16). My assumption is that it reflects the Danish eating culture, where it is typical to eat rye bread for lunch and hot meal for dinner. The assistive eating devices are still not quite good at picking-up meals with rye bread and Bestic is mostly used for dinners (Gaedt, 2013:16). For Bestic to pick up food, certain arrangements on the plate are required, for example small sized bites. Serving the meal appropriate for an assistive eating device necessitates compliance and some experience by the caretaker, like other innovations (Shove, 2005:53).

This was seen when Bestic was placed on the dining table. It rose the interest of the residents. Some of them were asking what it was and who was supposed to use it. That evolved into a discussion among residents, where some thought it was a dishonorable way to treat the person. Others thought that technology was part of our life now, and they might consider using it "but not before it is necessary". Resident C, who had a meek voice was left out of the debate. However she kept trying to eat with Bestic and ignored the negative attitudes. She was also asked several times weather it was too much for today and if we should stop, but Resident C insisted on continuing until half the plate was eaten.



Figure 21: Resident C is dinging with Bestic



Figure 22: Resident C cant quiet reach for the mouthful/bite

The Meeting

The Meeting-aspect is trying to raise the matter not only with meetings between customers and serving staff, but also sound customer to customer relationship (Gustafsson, 2014:87). In the health industry there are some other crucial aspects not regarding restaurants. The interaction among residents is a big part of

the table environment. It can be seen as two sides of a coin, as residents can be supportive, but also unintentionally abusive towards innovation implementation. In that situation the article proposes that service workers have the right to intervene within resident's interaction among each other as the staff play the role of the authority (Gustafsson, 2014:87). Caretakers can gain control over a situation for example by deferring the overwhelming attention from Resident C, but still being sympathetic towards the innovation being introduced.

The following day we came around to follow up on Resident C's experience. She was confident that it was a good try and the misplaced pity from the others didn't bother her. "They were just not aware that we had an agreement," she said. She also added that we were welcome to come again at any time, and that she was happy to be of help. That gave a good feeling that the preparation work had paid off. Resident C's feelings were not hurt and she was willing to give it another try some other time.

The Management

An informed management gives value to a process as they are able to actively participate with qualified instructions for their employees. In a healthcare setting this translates to the administrative section which can follow and understand the nuances of the whole process, can better guide the process itself. Administrations should therefore understand the general principals of technology – the practical and scientific knowledge behind it. Learning all do's and don'ts is a process which will require some time and adaptation.

If during long periods of implementation the technology will keep failing expectations, it might gain negative association (Shove, 2005). Here it would help to gain a mutual understanding of the managerial role on different levels. The dialogue about problematics and seeable implementation, will help to see the entire picture (Gustafsson, 2014:89). It is a form of domestication of the technology, when through learning to use the device we understand the meaning and benefits of its use in everyday life.

Since Bestic is a relatively new artefact the research in that area is only partial. Never the less I found a lot of general research on eating devises. I see it as a great challenge to collect and analyse all experiences but just as well as a great opportunity for a breakthrough in mobilizing that knowledge. Right now knowledge in the field is sporadic and when it comes to practice, it has done by the trial and error method, as for example that of Skovhuset. At the moment a lot of useful information have stayed untouched.

The atmosphere

The atmosphere aspect – I would translate as "the art of nursing" (Chinn, 2001) – as a collective description of well-functioning aspects stated above.

Problems with fitting Bestic for Resident C might partially be the result of scares information available on how to use Bestic and who it is suited for. The struggles Skovhuset have met in implementing the eating devise is probably the result of larger scale inefficiency of knowledge dissemination in the organization (Gustafsson, 2006). "We do not have instructions, we are figuring things out for ourselves" (head of Skovhuset). Mobilizing the resources and available theoretical and practical knowledge I believe would help the implementation and provide some useful guidelines for organizations, caretakers and disabled people

going to eat with Bestic. Cooperation of diverse social groups such as municipalities, nursing institutions and residents can help create aligned ideas about technology.

I discovered that there are several aspects in creating “the dining environment” in the eating process, such as serving of meal, neighbors, abilities to eat and others. At the Bestic home page they also mention their own description of an eating environment called: “Meal time puzzle”. It is a perspective on “meal from seven perspectives or seven pieces to a puzzle, where each piece has its part that contributes in order to make a whole”. It is a set of aspects, valuable for the health care process of eating; the aspects are: Responsibility; Ergonomics and seating; Mouth health; Nutrition; Independence; Social aspects; and Appeal to all senses. Investigating in depth those aspects will indeed provide a better picture of the practice of the eating devise, and I hope it will be of interest for future research.

I will not go in depth with the discussion of ethical, medical and social considerations raised by the Meal puzzle as it touches upon too large parts of considerations which I will not be able to cover in this inquire into the implementation of an eating devise in medical, rehabilitation and caretaking situations. However it would be wrong of me to neglect their presents and that the issues such as dignity and vulnerability and other ethical issues do take up their share in the discussion (Hofmann, 2013).

However I am positive that in the observed location Bestic has a great chance to overcome those obstacles as it is supported by the Danish welfare ministry (financially and collaboratively) as well as by a strong organizational culture, which endorses the use of welfare technology to enable residents.

Practice theory proposes that environment is a matter of social construction, and I would propose that other public and private institutions will have diverse organizational structures from Skovhuset. That variation might influence the process of implementation. Later in my discussion I will try to elaborate on how to overcome that barrier. Besides the outlines the analysis of individual organizational managements will create the need to adopt individual approaches (Shove, 2005: 55).

What is the role of caretaker?

As I illustrated earlier, the person who is not able to eat independently will most likely have troubles preparing meals, serving it and cleaning up afterwards. The Bestic.se homepage asks a rather rhetorical question: *“How does it feel to be fed?”* What we know with certainty with the words of Speech Pathologist, Eva Sandin: *“To feed someone is an advanced form of caretaking and demands knowledge.”* The mealtime is an important social and cultural part of our life and the action of eating and being fed will also in some degree influence a person’s self-identification (Martinsen; 2007:2).

As I seek to discover new practices in relation to the feeding process I want to refer to some well-established conventions of care tacking in Denmark (Martinsen2007: 209). Nursing is not only about getting things “done”, but also, and not least, to provide human care and comfort to a person in need. The idea that nursing is groundlessly replaced with robotic devises is a prevalent stand in the debate, which is often used as an argument against welfare technology (Etisk råd, 2009b).

According to the Bente Martinsen nursing practice include “*meaningful connection, performing activities in a sensitive way*” (Martinsen, 2007:209), the human characteristics, the experience and care seems as an important factor in care taking. The feeding can be perceived as a relationship between the caretaker and the disabled person. However, that will not be an equal relationship as the disabled person would be dependent on the caretaker: what mood caretaker is in, the speed of getting a new bite and just as well as personal preferences.

Nurse – patient relationship will entangle various nuances practical as much as emotional (Martinsen, 2007:209), which might provoke attachment as well as conflict situations. The caretaker is expected to provide nursing, but in a stressful situation, it can end up in irritation and impatience (Martinsen, 2007:213; Gaedt, 20013:31).

By introducing innovation, which would take the place of some of the caretakers, responsibilities will affect that relationship in one way or the other. To eat and to receive help in form of feeding goes far beyond the physical act (Wintherek, 2008:21) of opening mouth and putting spoon in it. The eating device will change the physical and social context of feeding aspect and care taking.

While I was investigating social assembly of care taking in Skovhuset it was important to pay attention to rhetoric as it can give out clues in reflection of local culture. (Spradley, 1980:64) Being conscious about the use of language I witnessed various ways to refer to the assistive eating device as an eating robot, robotic spoon, Resident C, called a toy, eating machine and so on. No one called it Bestic though. The Swedish company and product name “Bestic” is very close to the Danish word “bestik” which in both cases means cutlery. In the dinner situation that might cost lexical confusion. That might be a reason the original name never stuck.

Different new-created terms were used in different social situations, whether it was a meeting and during the “in between talk” -eating robot (Spiserobot), however with the resident we were trying not to use the word “robot” as it might have negative connotation.

During one of the status meetings the discussion turns in to the rhetoric’s of the technology. “Well we saw the advantage between calling the sensor floor for the *save floor* as sensor give some wrong association of electricity and safe floor describes it functionality - it is for giving safety”(charlotte). That idea was translated to the Bestic. By the same way of thinking instead of calling Bestic an eating robot it was proposed to call it an *eating helper*, and that was a way to create positive new assassinations (Shove, 2005:58), and described it’s functionality not it’s practical origin.

Bestic creates new practice as eating with assistive device, is neither to be fed nor eat in classical understanding. When introducing a new technology in one way or the other it will bring some changes in to the daily routines, but it may just as well stabilize and preserve traditional patterns (Lie & Sørensen, 1996:3). The same way we can look at using the Bestic. Replacing the way we use to take care of disabled people, but we can just as well see it as re-creating habits of a self-established grown up person namely: eating by them self (Martinsen, 2007:208).

Resident C is a very slow eater. She has been that way for a while due to the disease of Parkinson syndrome. She use to start dinner in the company of other residents and then when everybody is done and

left to their apartments Resident C would go to the launch part of the common area and finish up her meal there while watching the TV. She was happy to try Bestic and be part of the implementation research, however she thinks that there is no need for her to use such a device at the moment. Investigating micro-relations in everyday settings can illustrate encoded symbolisms of the artefacts, how it connected to the identity and social relation (Lie & Sørensen, 1996:3). For Resident C the use of the Bestic symbolized the inability to eat by herself and giving up the fight with the sickness she struggles with. I would suggest that eating with a little faster tempo by Bestic will be a practical benefit for Resident C. However even if it might have made her day easier, Resident C does not see herself as someone who needs assistance and treat the whole situation as a research project she wished to be part of, but not as an actual need (Brodersen, 2014:6).

I can conclude that it is important to see the Bestic not as a substitute for eating, but for giving the opportunity for disabled people to gain ability to do so. Resident C does not feel that way, and forcing her further will probably not give a positive result. The power of Bestic can be in re-creating eating practices in the new form, and that will require a desire of the person to do so. Bestic can establish new understanding of old practice and create links which will make feeding empowering and not handicapping.

I want to argue that in the home-work environment where the disabled person and caretaker should co-exist in the same space and do their practices, eating assistive technology should benefit both parties. That is a not an easy task, but does it play out well in practice? As technology changes both in physical and social context it also influences on human values (Hofmann, 2013:396). *"Some applications of welfare technology proved to be more useful for the health care providers than for patients themselves."* (Hofmann, 2013:394). By stating that, I touched upon the large debate in the area of ethical consideration of feeding and whom technology has to benefit.

Welfare technology should more than assist. It should keep the dignity of the patient (Hofmann, 2013), but it will hardly happen if a disabled person will reject the eating technology. The concerns of disabled people were highly prioritized during the Bestic development (bestic.se) which enabled citizens in active collaboration with Bestic. If a citizen will not actively participate: taking food from the spoon and eat, the process will not emerge.

However, I am not intending to go deeper into the discussion of validity of feeding practice and emerging assistive eating practice aspects. I merely want to underline the obvious change in practice and as a result the possible change in the patient-caretaker relationships.

The idea of feeding is far from new. People unable to eat being fed by others in fairly long time and established itself not only as practical help, but also as a social event of nursing, the mental and physical support (Etisk råd, 2009b; Martinsen, 2007). Feeding can be reflected in several aspects: as part of the work which needs to be completed and might involve sights of impatience; however it might be viewed and performed as nursing and involve care and acknowledgment (Martinsen, 2007:2014). An eating robot can hardly substitute those qualities; however, it can offer something else – the ability to eat independently. This welfare technology aim to empower the person in need (KL). The thought that one masters the robot it is much more satisfying, than the thought of being "fed by the robot". Even though the action stays the

same and the power of symbolic meaning can change the message (Shove, 2005:51). A lot of disabled people want to be independent and Bestic can empower that by providing autonomy (Brodersen, 2014:7).

“Assistive technology should do more than assist. It must be a natural part of everyday life and meet users' needs and preferences both aesthetically and functionally.” (Domènech, 2012:100) Therefore I suggest that calling it eating with/by Bestic will highlight the empowering sides of the eating technology as it cannot provide the “art of nursing”(Chin, 2013).

The personal choice of actions will give freedom to the situation where a resident does not desire care and nursing and would rather identify him/herself as being independent (Brodersen, 2014: 3). That may free some room for other sorts of human interaction as ability to communicate with other residents and less pressure for caretakers (Gaedt, 2013:25).

So, in first scenario we empower residents and it is the strength of Bestic, in the second scenario we disabling them even more taking the nursing away from someone who needs it. The key might be to include the thought of how to reach for the “right users”. It might be a challenge but also a success criteria, as when that will be defined less misfits will occur.

The other valuable comment in that section is to draw attention to the sociological barrier which can stay on the way of implementation. In a dining situation as described above the nursing staff were mediators of the eating device, Resident C's privacy, and other residents who were debating about feeding nursing practice. I can propose that this kind of debates will not keep appearing more commonly. The eating devices will be eating with Bestic and will establish itself as a practice in it's own right (Shove, 2005:53).

The designers have done a lot of work to make it silent and attractive looking. However, there are some other issues, which may influence on the Bestic eating experience. To overcome the challenge of the idea of eating assistance should not be strange or provoke a negative reaction among residents. Just as walking aids or hospital beds are regular tools for elderly in nursing centers. Those technologies was “normalized” (Shove, 2005:50) some time ago and now accepted by the residents.

Making technology “more common” would make it less strange, and may even make it more attractive and appealing. (Shove, 2005:52) As it may be a sociological problem of “how do I look like with that spoon”.

My worries and proposals at this point stands at the position, that there is a conflict of the interpretations of how Bestic is promoted. What values does the producer put into eating assistance and what kind of associations do the observed elderly have by me? That builds an unspoken wall of miscommunication where surely some time and adjustments are needed. There need to be a change in the form of interpreting the assistive eating device as a symbol of independents.

Who is Bestic designed for?

Right now there is no clear definition of particular Bestic users besides: the quite broad description of *“persons with different neurological diseases such as MS, Polio, ALS, Parkinson, CP, spinal injuries or Ataxia.”* And *“people who suffer from rheumatism or muscle weakness and those having trouble gripping and lifting a fork and a knife due to amputation, spinal injury, brain damage or Cerebral Palsy”* (bestic) which is quite a generalization. I realized that in order to investigate every disease and possible condition variations will require tight collaboration with neurologist, physiotherapist and a large scale of ethnographic investigations, which is too big of a task for the current project. Instead I decided to use an exclusion method and at least describe some criteria of who Bestic is not suitable for.

Configuring the users of technology is a complex process including reflections of a variety of user representatives (Oudshoorn, 2004:37).

In the case of Bestic the initial development started from Sten Hemmingsson engineering the idea. Later on it got support of robotic designers Robotdalen and collaboration of Assistive Technology institute of Sweden.

That coalition of organisations left in-print of how the user image was constructed (Oudshoorn, 2004:37) Sten Hemmingsson: *“I wanted to see if it was possible to manage eating by yourself even with very little capabilities in your arms and hands. And to make it work well and feel good.”* The idea and the future vision of users were mirrored to the model of Sten and his needs and abilities. *“We wanted to create something outstanding we would like to use ourselves”* said Ann-Louise, project developer in our Skype meeting.

The developers clearly saw themselves as “users” and took their view of a problem as a starting point for the future Bestic development. Later they added nuances in form of investigation of how does disabled person interpret feeding and what practical and medical assumptions needed to be included in the design considerations. That kind of prototyping can be described as “I-methodology” where designers consider themselves as representatives of users (Oudshoorn, 2004:41).

On the Bestic web page, by description of “who can use Bestic” it is stated very implicit, that the main criteria is a desire to eat independently (Bestic). That idea was certainly adopted by care center Skovhuset, as that is the same way all other welfare technologies are introduced in the nursing center. However, the picture looks a little different on the national scale.

Political–social strategy of the Danish health system allows openings for investigations of new welfare solutions. The interest was directed towards assistive eating devices and Bestic was included in a list of validated welfare technologies. By that, Bestic got new opportunities of substantial distribution growth within Danish institutional environment.

Since there were no defined guidelines on primary users, municipalities created fairly abstract accounts which can be described as “technology for everybody” (Oudshoorn, 2004:41). Here “everybody” is someone who is fed at the moment and can be seen as a potential user. At the moment there are no other restrictions of who the technology is designed for and importance of motivation was not formulated.

Too broad account provoked misinterpretations and even cost the unfortunate experience (Nickelsen, 2013:14), which in its turn may cast a negative light to the rest of the implementation process.

Mismatch of the initial development positions started to be apparent within large scale implementations. *"If the user representations incorporated into the artefact fail to match the actual users, it is very likely that the technology will fail."* (Oudshoorn, 2004:32) Therefore, finding the right users for a given technology is one of the key aspects for Bestic to succeed.

Screening

The process of selecting the right residents for the specific welfare technology at Skovhuset is called screening. The terminology is proposed by the IT institute (Charlotte - interview). The physiotherapist as a leader of assistive eating technology group, have chosen three residents - potential users of Bestic. I found that the similar process is described both on Bestic home page and in the WTA report. Skovhuset has found previous descriptions too general and developed one of their own version of selecting the right users. Physiotherapist also describes it "meaningful implementation". So *"we not just take some random person just to show you how it works. It should be provided for someone who really needs it"*. Three residents were chosen by falling under the category of the screening.

Talking with the physiotherapist about how she picked the person for implementation, she explained the process. She is always around listening, and talking with both residents and caretakers. She is participating in morning status meetings and knows what's going on. She was also the one who was part of this project from the beginning and when it comes down to "screening" - *"I just pick that knowledge up from my head"*, which is a reflection on trial, and error approach.

The principle used in Skovhuset allowed maintaining dignity of the residents. The Bestic was a mismatch this time, but that methodology showed a success in terms, that no one's feeling got hurt. All participants feel good about the implementation by the end of the day. Resident C said that *"you may come another day"* and *"It is ok we can do it again"*.

Even though individual approach is important and functions on the scale of one care center, if that should be enrolled on the municipal level some structure should be found.

Mental condition matters

The Technological Institute (TI) of Denmark is a recognized organization, which is collaborating on a national level with several municipalities as Center for Welfare Technology (KL) and Digital Agency (Digitalstyrelsen). On the official TI homepage the users of assistive eating device are described as *"People with different types and degrees of physical disability in the arms and hands, may find it difficult even to eat and be assisted by relatives or caretakers at every meal."* (TI)

I want to look closer at this statement. Resident A was chosen for the implementation of eating assistance as his left arm was paralyzed after a stroke. His other arm kept functionalities in the degree needed to press the button on Bestic. From the description Resident A can be a very suitable candidate. Unfortunately besides the physical disabilities he was also in high degree apathetic and suffered from dementia. He was

positive and accommodating one day and he could be angry and annoyed the other. Resident A was not capable of grasping our intentions, and he probably would have troubles understanding the logic of using Bestic and the practice of incorporating with it. That was the vital reason for not to continue with the implementation.

With that example I want to illustrate the idea of “personalized” or “meaningful” screening. Even though there are some descriptions and recommendations of who a reasonable user of the technology might be, the individual approach and collaboration with nursing staff is needed.

Therefore, I argue that we need to include emotional and cognitive conditions of the disabled person into descriptions of potential users. Rephrasing the Bestic AS statement: The explicit user for Bestic is a disabled person who longs after independency. The motivation, I mentioned before can be taken as one of the criteria's for the implementation.

Nurses are users

The eating aid is a technology, which requires active participation as leaning forward, pressing the button, picking up the food from the spoon. The resident and the caretaker will have to have mutual agreement of active engagement. The caretaker will have to perform the task of serving the meal and all nuances (as described in meal time puzzle) that process may include and the resident will have to actively emerge in cooperation with Bestic and eat with it. The Bestic is functioning in that way that the resident should actively open the mouth and insert the meal, and if the resident for some reason will not be able to interact with Bestic any further implementation will be problematic.

The Bestic was made as a product with user oriented design (Bestic.se), but as I described above there are two types of users (Brodersen, 2014:2). The residents I witnessed in the elderly center had not only troubles of eating; the serving of meals, cleaning up afterward's, even cutting large pieces of food was the caretakers task. Right now assistive eating devices are dealing only with the feeding/eating part of the issue. It is not giving the absolute autonomy for the disabled and *multiple-user practice* as inscribed in Bestic design (Brodersen, 2014:6; Akrich 1992:208) where a disabled person is on one side and the caretakers or institutions are on the other.

However, the problematics of a person eating were central in product development of the device. Topics such as how fast we eat, what kind of experience is it to eat by Bestic compared to be fed and so on was taken into consideration (bestic). Unfortunately, some small functionalities are not included in the description as visual manuals and descriptions of how food should be served and similar. From the Bestic perspective by the main user was obviously considered the disadvantaged person, not the caretaker. That means that it was in-scripted to primarily empower the person eating with device (Brodersen, 2014:9). It is generally an encouraged take as it responds on value sensitive design approach, where the active users interests are central (Friedman, 2001:348). However, by setting the attention to the eating-user, the caretaker as user was excluded. I think it would be beneficial to include care takers and see them as a part of the process.

Since Bestic should exist within complex social context of institutional environment it should be incorporated into such. (Brodersen, 2014:6) The primary user - the disabled person cannot avoid the help in that process the improvement of usability for the care taker will benefit both parties.

Taking interview with the Danish distributor of Bestic, she mentioned that possibility of multiple-user settings is a new function in Bestic settings. That is made so the assistive eating robot can save various moving patterns to fit different users. It was made by demands of nursing centres who would like to share rather expensive technology among several users and that way adopting it for public centres conditions. The nursing homes took the share in the shaping of the Bestic functionality. Everybody who uses that technology can consider themselves co-designers, not meaning that everybody has equal power, but that every user in some way influence the technology he/she uses by the way we are doing it. (Lie & Sørensen, 1996:5)

Maybe Bestic was designed for the individual use and individual approach to every user, in order to make it fit and adjusted to the single person. However, now we are dealing with a national scale project, where communes with multiple management levels are involved. It is important to have inline idea of specific welfare technology.

Practical adjustments will benefit everyday practice of Bestic within institutional environment where efficacy is one of the criteria (Martinsen, 2007:213). I may propose that the lack of established recommendations is one of the reasons why institutions struggling to adopt it. It requires more time and work than expected and to find the right strategy, some common work should be done (Lie & Sørensen, 1996:5). I propose that a solution can be done by further investigation. In long term it will save frustrations of the personal (Nickelsen, 2014:17&24), undernourished or unhappy patients and importantly decreased negative feedback.

Non-linear process

It is a very common way to look at the welfare from the political-economic perspective as: *“technologies that can assist users in their daily lives and optimally provide a better work environment for employees while at the same time ensuring a more efficient provision of public sector services.”* (The Agency for Digitization). That gives sustainability of national investments to including assistive eating technologies in order to optimise the welfare sector (digitaliseringstyrrelse) as *“The orthodox Marxist account of technology (...) understood as a force of production and efficiency”* (Lie & Sørensen, 1996:5).

However, I have a range of other factors Skovhuset rely on and want to include into that account. The factors which may be added up, value in long term as: workers/patient satisfactions, reduction of stress, employees' sick leaves, and prevention of patient illnesses. That way of thinking is presented by the IT institution and their Welfare-technology-Assessment model (WTA model). That is the reflection on what composition of values have to play in, before the efficiency can be calculated. Unfortunately the so-called “human values” or long term effects are at the moment poorly discovered within eating assistance and are hard to predict in a full scale.



Figure 23: Circle of values match

Green field: Organization: the employee and management level

Red field: Technological: functionality and sustainability

Yellow field: investment, support

Blue field: Citizen: utility, personal value

The WTA article shows equations where some money can be saved by calculating time used for feeding and replacing it with the cost of assistive eating device technology (Gaedt, 2013:22). Still one should be careful to put too many ambitious in that kind of calculations and use them more as guidelines. It is hardly possible to save a certain amount of founding by calculating saved minutes, as the results might be not that immediate (head of Skovhuset). It might take some time to domesticate a technology in the beginning, and only the results in long term might make savings – in form of decrease of sick leaves and hospitalization bills.

Municipalities entered the subject with description of general physical disability rather than cognitive or psychological conditions, which might need further attention (Agency of digitalisation). By method trail and mistakes there were discovered approaches of who is suited for implementation, but those descriptions still stay very broad. The illustration of the same strategy is shown in the WTA-report, which was made on a slightly other eating device a year before Bestic was released on the Danish market. That might be the reason of variation in some technical functionalities, however, the core conceptions lie very close.

One should be careful adopting eating technology for someone who is not able to grasp the situation or not able to actively choose the technology. Unless the practice will be well established, and studied in more detail.

By that, I was trying to illustrate that the implementation is not a linear process, it will depend on many factors as diagnose, physical and cognitive condition functionalities, not least the organizational flexibility and support and most importantly resident attitude towards innovation and motivation. I see that some conflicts can be illuminated, and there will be slimmer chance to misuse the trust of *art of nursing* (Chinn, 2001).

Summery

Even though the ambition of welfare technology is to help disabled people in their everyday day life, innovation also have to help the care institution staff in their practices and optimization of work space. (Brodersen, 2014:7) Bestic orientation on disabled persons might turn out in uneven distribution of inscribed usability (Brodersen, 2014:8) toward citizen as user.

The Skovhuset did the right thing of not pushing the idea, but taking it slowly and in a respectful manner. That way Skovhuset secured themselves that there was no feeling harmed during the process as it was done with both agreement from both sides in the use or rejection of Bestic.

Discussion

Through the case study I wanted to contribute to the process of Welfare technology implementation in the health sector: The technological eating aid, invented for people with physical disability.

Implementation of welfare technology is a complex process involving various social groups who negotiate their objectives with the aim of stabilization (Pinch & Bijker, 1987:40-41). I discovered and described the most significant ones within the scope of my study: the Danish municipality and its will to improve the health sector by introducing new welfare solutions (KL-report). The health care institution, Skovhuset, who is eager to offer good nursing as well as dignity for their residents (Hillirød). There are active player: Bestic.se, the private Swedish company who is offering the technical solution to the eating assistance and essential social groups in the municipality, caretakers and the residents of Skovhuset, as illustrated below.

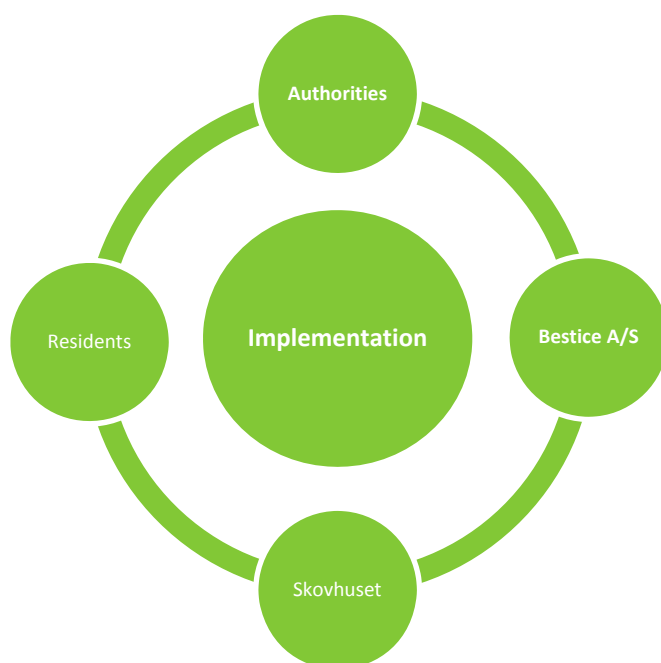


Figure 24: Identified social groups

Even though the residents did not invent a strategy towards implementing the eating aid technology, it is important to acknowledge their active position and avoid *victimization* of them as an active social group (Lie & Sørensen, 1996:18). The residents in Skovhuset are active participants in the introduction of the eating aid, it is them who have to perform the practice of eating with Bestic and it is them who can refuse to cooperate, simply by not using it.

In the beginning of the field work I pictured myself as an observer silently shadowing the practices of the elderly center. However, the dynamics of the place, the atmosphere, the inclusion of us as researcher and the involvement from both sides involuntarily made me and my academic colleague active participants. It made us a part of the process in much a higher degree than I expected. From the beginning I was very pleased by the way things were, but it also created some problematics as to how I should reflect the degree

of involvement. I found myself in the position of an *insider-outsider* (Spradley, 1980:51&60), as I was aware of my influence on the process on creating the social construction. The relationships started to take the form of a partnership and me having direct influence on the process, by participation in the meetings, talking to residents and figuring out the functionalities of Bestic.

This problematics can be addressed from a *phronetic social science* take, where studied practise is seen as pragmatically governed interpretation (Flyvbjerg, 2001: 140). My aspiration is to take an active position in suggesting and integrating findings, but not try to develop a universal theory or a new universal method.

"The task of phronetic social science is not to clarify and deliberate about the problems and risks we face and to outline how things may be done differently, in full knowledge that we cannot find ultimate answers to these questions or even a single version of what the questions are." (Flyvbjerg, 2001:140).

Even though Flyvbjerg is supporting the idea of validation in frames of his study, he also accepts its imperfection. The case study can't provide indisputable solutions, though it can offer suggestions and partial analysis of the problematics.

Studies have been done by multiple municipalities in Denmark such as Aalborg, Frederikshavn and Hillerød (Hillerød). The Danish Technical Institute made a large investigatory report on eating assessing technologies (Gaedt, 2013) but still there is some inconsistency in knowledge sharing. Local practices are not communicated further. It looks as if it is now a perfect time to combine efforts and share experiences, for more productive results.

Phronetic social science proposes to *"produce input to the ongoing dialogue and practice in a society, rather than to generate ultimate, unequivocally, verified knowledge"* (Flyvbjerg, 2001:139). That way I can suggest that what we need to stimulate is dialogue, understanding and even reliance among different social groups. If that can be accomplished the health care system groups will be able to make richer reflections and make the voices of other social groups sound.

It is important to mention that it would not be fruitful to establish a framework of common methods, as implementation is always an individual process and works differently from one institution to the next. However, communication among institutions and communes might inspire others to find their way to the assistive eating technology. I believe that workshops of other sorts of activities will stimulate interest and knowledge flow between institutions. (Shove, 2005:53) However my intentions are not only to stimulate dialogue or discussion, as Flyvbjerg suggests, but also to engage and participate in the implementation itself. (Flyvbjerg, 2001:139).

Crisis

After it became evident that none of the residents would succeed in eating with the robotic spoon, I got a feeling that the case-study was a failure. The goal I had put up was not achievable and my pre-assumptions of how things looked in reality were not accurate. I had to take a step back and start to analyse of how far I had come, what had I achieve, and what would be the consequences of me starting all over. Keeping in touch with my academic supervisor during the process was a great help to me, and just as much if not more, to keep in touch with my sparring partner and the personnel of Skovhuset. Discussing the issues and possibilities, did not necessarily give me solutions but it guided me in certain direction. Through analytical

thinking and surfacing some overlooked facts it suddenly became apparent that I had made a lot of findings during the observations of almost two months of investigation. This helped me re-focus and I found potential in the current situation. I decided to turn misfortune to opportunity, as Skovhuset probably wasn't the only place in going through similar challenges of technology implementation. Discovering and analyzing obstacles is be my contribution and opportunity to avoid them in future.

Analyzing observations through a theoretical grounding empowered me to put an academic angle to the process that already took place in Skovhuset, which could be defined as an analytical description of those practices. I attempted to make sense of the entangled interactions of various social groups struggling to come to the closure in the implementation process (Pinch & Bijker, 1987:41), acknowledging things that had worked out, and making accounts of the aspects which didn't in the process of implementation of the eating device.

Implementation Propositions

The creators of Bestic were through a long process of considerations in order to make their product reach a high quality (bestic.se). In its turn Skovhuset was also a representative of highly motivated institution experienced with innovation. The big wonder is why it was a challenge to practice Bestic eating? The way to uncover this is to find the gaps between intentions and social application i.e, coming from the designers table to the table of a nursing center (Lie & Sørensen, 1996:18). To visualize my foundlings I have made a graphical representation of the design assumptions and how they can be adopted or domesticated in the institution.

Research questions	Design assumption	Obstacles	Propositions
How to 'blend in a natural way' in practice?	attractive design	Construction of practise	Step-by-step introduction
How does Bestic functions?	Easy to use	Use outside manual	Knowledge mobilisation
What is 'the dining environment'?	Your own conditions	Interpretive un-flexibility	"homiefying"
What is the role of caretaker?	Underestimated	Duality of user needs	Incorporated practise Normalisation
Who is Bestic design for?	"Everyone"	User identification	Individual active implementation

"The consumption is always a production [...] these two are inseparable" (Lie & Sørensen, 1996:10). According to domestication theory it is important to investigate the consumption and production to identify their characteristics. In that I would emphasize the user active position in technology development and how it affects the *"relationships of technology on everyday life"* (Lie & Sørensen, 1996:10).

Essentially for my investigation was the articulation of practical solutions or even better the propositions to the obstacles and challenges one institution can face in the process of implementation of welfare technology. In the table I have tried to concentrate the key findings of that process. I divided my analysis of the field into five interconnected research questions, where I described the reflection on the design assumption made by the production company. The design had some contradictions in the form of challenges which the care center faced while introducing Bestic. Finally I attempted to formulate recommendations for the implementation process which are pointing at the possible directions of solutions.

Analyzing that formula helped me to discover why the assumptions were not enacted in practice. The main reasons were that some of them were taken for granted; others demanded way more attention and interpretation than initially expected.

Step-by-step introduction

Even though the welfare technology is a well-established phenomenon in the Danish healthcare system (Gaedt, 2013:4) there are still ongoing negotiations of how caretaking and welfare technology should coexist and supplement each other (Brodersen 2014, Gaedt, 2013). Every time new technology emerges it has to find its place in everyday life routines (Lie & Sørensen, 1996). *“Product by itself has not much value if not included into practice and allied to requisite forms of competence and meaning.”* (Shove, 2005:58) As I can see from my analysis no clear established or common recognized patterns of practices have yet emerged.

Since Bestic is not fully incorporated into everyday practices, the alertness is so far strong on identification. It is a real challenge as well as threat for the implementation phase as disabled residents as well as care assistants can be suspicious towards the technology (Brodesen, 2004:4).

The implementation is only at its beginning and there are no clearly established practices taking place of how to use it. I characterized eating with Bestic as a *proto-practice* (Shove, 2005:48). We should accept possible adjustments, which may come along. But what is the social meaning of eating assistance and how does it carry along? Innovation is not determined by new products, what really matters is the way in which constituting elements fit together (Shover, 2005:61). Careful and humble implementation, where user interests and understanding become central (Björgvinsson, 2012:105).

I can find a lot of information in both the WTA report and on the website of Bestic. How come it is problematic to introduce Bestic to the elderly? The way to approach this problem was proposed by the official distributor of Bestic in Denmark, Bente Tolstrup. She proposed a strategy used in the municipality of Aalborg: *“They just bought a lot of Bestic robots and announced that everybody who wishes can have it. It is a very inspiring and pro-active commune.”*

The first domestication step and probably key for successful implementation are volunteers. When more motivated users and caretakers gain some practice and knowledge, when it will be “normalised”, it might be easier to promote the idea to the now more challenging patients with weak cognitive skills. In the interview for a local TV-station Tina Nielsen, the representative of Aalborg municipality (appendix 7), made the statement that: *“They (eating aids) can be used in the places where citizens are aware of their situation*

but their physical state sets some restrictions.³” That mirrors the take Skovhuset has on *meaningful implementation*. There is no need to push some technology through against people’s free will, but with a proper introduction, argumentation and good examples from the neighbours it will come more naturally. (Shove, 2005:59)

Knowledge mobilisation

In order to test Bestic for ourselves me and my sparring partner decided to try to eat with Bestic, to figure out its most obvious functionalities and limitations. We were served yogurt and a curry-rice dish. We were aware that our “test” would not present a realistic environment as we both are physically and cognitively well-functioning, which made us both more flexible towards technology. However, we also might be pickier, as we were comparing eating with Bestic with independent eating, and not with being fed.



Figure 25: Eating yogurt with Bestic



Figure 26: Eating rice with Bestic

While doing the test we realized that there are a list of limitation compered to the eating by yourself such as messiness of the process, unpredictability of which and how much food is getting on the spoon (sometimes empty, sometimes overloaded). And it only got worse by using the automatic single-button controller. In that light I would suggest that the picking up of desired pieces and amount of food on the spoon is not the strongest site for the eating devise. I would suggest that a caretaker would do it much better.

On the other hand the fact that there is no person interfering in the process of eating can give some strong values of independency and self-acknowledgment: “*we prefer do the things the way we use to do them*” (B. Tolstrup). Domestication is a process of making sense of technology, this is why, if it doesn’t make practical sense, it is hard to get around and implement it (Lie & Sørensen, 1996:17). Bestic is a technology where a person should actively participate in the process for it to succeed. And if it works well, then some practical issues may step in the background. If a person is actively willing to be independent from caretakers then it is a way to arrive at that goal with an ambition that time and experience will help technology to improve.

³ De(sprise technologier) kan bruges de steder hvor bøger er bevist om sin situation men det fysiken setter noglegranse hvad man selv kan.”

The process of domestication is a process of giving meaning to the new technology in everyday life (Lie & Sørensen, 1996:17). By that logic it follows that a reasonable explanation needs to be provided for the user. It is important to know the description of why these practices should be introduced in the first place and how it will benefit the work or health condition in the long term. Without that key step the disarray might appear, which in its turn will hinder the implementation.

Competence and skills (Hjorth-Hansen, 2002) are considered as the strengths of nursing and to keep it at a high level, nursing staff need to be educated in practicing welfare technology, even if it is generally “easy to use”. Motivation for learning requires a strategy. Bestic offers courses and seminars, and in my interview with my colleague I discovered that Frederikshavn commune offers ECTS points for an eating aids tuition program. We have the possibility to include assistive eating in caretaker’s education program or some other options may take its place. Acknowledging different opinions of social groups and bringing them together will democratize the process and give value to each group (Björgvinsson, 2012:106). The leader of Skovhuset proposes that employee involvement from an early stage: *“so they feel that it is also their project and not something forced from above”* (head of Skovhuset). It is central to talk about ethical and practical challenges in an open and transparent manner, but not provide explicit recommendations and rigid conclusions. (Hofmann, 2013:391)

Homiefying

“... what is involved in the (re)invention of the practice in another context. Again, cultural history is critical; again, image is all important; and, again, the institutional environment matters.” (Shove, 2005:55)

I propose that this can be used as a great opportunity for creating a value sensitive implementation (Friedman, 2001: 350) where both the residents and caretakers will be treated as active participants. *“The ethnographic move challenges the researcher to look at the situation through the eyes of end-user”* (Marc Steen, 2007:8). However, the goal is to look at the Bestic practice holistically and then there are at least two end-uses who might have very different views, motivations and understandings of the same situation: the citizen and caretaker.

By “homiefying” I mainly mean domestication, with an accent on the fact that it is not an ordinary innovation which have to be tamed, but a welfare technology that serves multiple use practices and it has to both do the practicality of eating and give a *homy* feeling (Brodersen, 2014:6) .

Through the design statements it is clear to see that Bestic.se presents their product as a substitution for a person’s ability to eat independently (bestic.se), when in various reports (Gaedt, 2013; kl 2013) on welfare technology within the Danish health sector it is seen as an alternative to feeding. That fine line gives a conceptually different take on the understanding of practices of “Eating with Bestic”. I discovered that the Bestic-robot is a product constructed for individual use and to be adoptive and empowering for a motivated, cognitive capable individual, who for some reason has lost motor functions (bestic.se).

Assistive eating technologies adopted within Danish municipalities are, however, used as a tool for institutions. Part of the implementation is also for cognitively challenged citizens (Gaed 2013). This creates

a gap between the original product design and emerging practices (Shove, 2006:44). The result of this being that it caused some practical challenges in the implementation process.

Institutions are more complex than home an environment. As I made an illustration in the analysis part using Bestic in a common dining area with other residents at the table we can't overlook the fact that it in some way may affect other residents than the ones who is eating in some way or another. As for example the agreed upon places might have to be moved, or some comments might be said as: *"If I will come in a position where I can't eat myself, then I might think about eating with Bestic, but not before!"* was an attitude of one of the residence by the dining table.

That way eating with Bestic can be perceived as accepted by citizens being self-incompetent and that it might be a reason for some who will not admit, for some reason, their condition will not likely appreciate the use of eating aids.

At the same time Resident C, whom I introduced earlier, can eat by herself. It is not sufficient, it takes time and effort, but she is not yet getting any help with eating, only cutting large bits in pieces, serving and cleaning up. It is a very individual process, but the likelihood of someone who refuses assistive eating because of a feeling of giving up to the sickness or acknowledgment of aging is present.

The process of integration or implementation implies work in a practical as well as in symbolic domain (Lie & Sørensen, 1996). I.e., when one is breaking old routines the new will arise on different levels as the most obvious practical ones as well as in a level of *"symbolic codes, and may be converted into something personal, attached to one's identity and social relationships"* (Lie & Sørensen, 1996:10). Bestic-eating is a very individual process, not only practical but also in a very big degree social self-identification, and for artefacts used in common areas there should be an account for that issue. The way to work around that challenge would be to re-visit the implementation strategies in a more citizen sensitive manner.

Incorporation of caretakers

I analyzed the role of the caretaker in the process of feeding and the change, which would follow from introducing Bestic. If the use of Bestic is feeding, then it is the institution or caretaker who is responsible for that process. I would prefer to call it EATING assistance or eating with Bestic. It is an attempt to go beyond the practice of use of artefacts and unwrap the meanings and symbolic realities of practice. (Lie & Sørensen, 1996:17) The rhetorical change will empower the disabled person to take responsibility, and control over the eating and recognize him-/herself as the direct user of the device.

Here I want to bring forward the thought that *"proven advantages should be enough to overcome personal vanity and misconceptions"* (Shove, 2005:53) to see the empowerment instead of disablement of innovation. It would be easier for someone like the engineer and founder of Bestic, Sten Hemmingsson, who has a personal interest in the innovation, has some experience with it and is looking for similar solutions for autonomous eating, however, the users I observed in the nursing home have to overcome the stage of domestication of innovation first, for citizens just as much as caretakers.

The problematics of the *art of nursing* (Chinn, 2006:287) are relationships between the patient and caretaker and how we can embrace it through technology. Bestic can empower people with strong will and

courage to gain more control over their life, people who are longing for more independence (Nickelsen, 2013:19). However using Bestic for depressed, unmotivated, lonely people might isolate and disable them even more. I do not have the goal of criticizing welfare technology and promote the well-known feeding. I want merely to propose that both of these aspects may be a valid solution in different circumstances.

Taking into consideration patients with radical mental conditions it is very hard to draw a line between whether a person is capable of using assistive technologies or not.

Neither is it clear what physical limitations should be (Gaedt, 2013) as there are a wide range of undiscovered possibilities to the use of Bestic (B. Tolstrup). I would suggest that the definition of those possibilities require another larger empirical investigation on a later stage of the implementation. At this moment I want to propose that not only physical and cognitive but in a higher degree also mental state should be a key validation point when a patient is chosen to be offered an assistive eating device. As it is stated on the homepage of Bestic the motivation plays an essential role in introducing Bestic smoothly.

For the caretakers this meant new work practices and assignments, as both they need to learn about the new technology and motivate the citizens to adopt the technology. It looks like the best results are gained from participants who actively choose to eat with Bestic. When assistive eating technology was introduced to a cognitively challenged person, it was hard to introduce the logic of situation (Nickelsen, 2013:17:). The collapse of the *inscribed design* and implementation can cause frustration and the inability to succeed (Nickelsen, 2013:19).

Individual implementation

Designers of Bestic have intentionally drawn the user portrait from Sten Hemmingsson: “*we wanted to make a robot we will feel like using ourselves*”. Therefore quality, nice design and that it should be silent was important. That process reminds of a lot of *I-methodology*, where designers reflects users as themselves, and take their own knowledge and experience as a main source of inspiration (Oudshoorn, 2014:41). Since there was not concrete description of users – the user was interpreted as “everyone” (Oudshoorn 2014:41).

In previous chapters I was talking about the caretakers motivation of use and appropriation of innovations. However, there is another side to “motivation”, the side of the other user, the disabled person, who is supposed to eat with Bestic. I argue that “assistive eating” should be recognized as its own practice. The way the Danish health care system constructs it is by distributing certain services to the disabled citizens. Every service has a description and its “cost” or approximate time to be spent on that service (visitation). Since assistive eating is a new phenomenon the description for it is missing. Probably from a regulations perspective it will be an advantage to enroll eating aids as a separate services.

The visitation or in other words the evaluation is a very important step for successful implementation. It is a process of matching the needs of citizens to the services and welfare technology available for covering needs and improving daily routines.

Right now there are official descriptions of what kind of help the citizen can require from the caretaker, which includes: “feeding” and “serving the food”, which allows caretakers to spent 40-30 and 15-10

minutes respectively with a citizen (visitation). Assistive-eating will probably need a new kind of paragraph as it doesn't fit nicely in any of the already established. It is not yet certain how the administration of the eating aid should look like, as there is still a need to serve and clean up after a citizen, and will it "free" some time in between.

This can be an illustration of why it might be misleading to calculate success of eating technology by simple multiplication of disabled citizens times hours saved, it would especially be misleading to raise too high expectations in figures and hours at a early stage as it might cause pressure on both residents and staff.

However, taking as an example other welfare technologies, it is known that there is a whole new field of undiscovered positive effects of using assistive eating technology such as greater life quality of residents (Gaedt, 2013:31), positive change of diet and there may be others. These qualities are hard to predict and measure right now on such an early stage but need to be investigated later on, and it is even harder to know how to include it in budget calculations.

Conclusion

In writing this work I was aiming at adding nuances to the body of knowledge for the implementation process of assistive eating technology.

I proposed that it could be done through a qualitative case study. This kind of research in its own right can contribute to the bigger picture of academic inquiry into implementation processes, and can stimulate new reflections on the technology in relation to the given social issues. It might neither be neat and polished nor provide any precise instructions for use, but it has a huge potential to uncover issues in both depth and width.

During this inquiry I attempted to describe how construction of symbols, materials, organizational cultures and other elements comes together in providing competence and creating meaning in the implementation of assistive technology. (Shove, 2005: 57)

I entered this inquiry with an ethnographic perspective and it is indeed a complex social construction, where many practices are involved and interact. To overcome that complexity I divided my inquiry into the problem areas of the design assumptions, where each assumption was illustrated or contrasted with interplay from real life situations in a care center. Later I was able to identify relevant social groups, which gave me the opportunity to define the perception and appropriation of the artefact better. I attempted to contribute to the field of knowledge, and support value sensitive implementation of welfare technology.

Through that process I constructed a list of propositions which can be used as a starting point for dialogue within different social groups and might cast light on some undeveloped aspects within the problematics of introducing new technology.

When the technology is new and unproven in a certain social context one of the things we turn to is the official description and our common sense judgement in order to appropriate it. However the description can't include all possible social situations and might be outplayed in numerous possible ways. My goal was to investigate how it was done within the social construction of the Danish care center Skovhuset.

In my approach the official description was a certain point for further ethnographic investigation of obstacles that they created in the implementation process. That approach lead me to construct a grid of relations: the design assumption, the obstacles faced in practise, and the direction of possible solutions. It was not all that easy to separate those assumptions with a clean cut as practises and problematics were very tightly interconnected. However, after some struggles I succeed in formulating five applicable propositions which might stimulate debate in new directions.

Through inquiry I discovered that the new technology has difficulties to blend-in in environment where the practises of use of that technology are not established. Gradual introduction can probably help smoothen out the implementation, however the careful plan of how it would in-act on every given institution have to be made. The functionality of Bestic was the other issue as no matter how well thought up the usability of the device needs to be appropriated within a social construction. I discovered that the social construction goes a long way beyond mastering the device settings. Mobilising knowledge of how it can be done will

improve this process and ease the struggles of individual institutions. The dining environment turned out to be a bigger issue than I initially expected it to be. It involves a whole range of hitherto unnoticed considerations and make me think of the importance of establishing relations not only between resident and device but also between resident, device and surroundings, as a part of the technology objectification. The possible solution could be to “homiefy” the technology e.g., give it a suitable name, customize functionalities and hardware etc. The role of the caretaker was the most challenging issue as it touched upon numerous ethical issues. The role of the caretaker is a highly debated topic within the Danish health sector, and I tried to black box it and bring only practicalities to debate. From this perspective I turned to the basic principles of nursing and the recommendations from the Bestic production company. Only motivated residents should be involved in the implementation to start with. That way caretakers will not feel forced into difficult situations and the residents will not suffer from a deprivation of care. Once an eating device has established its practises and thereby be “normalised” it will be easier to motivate less enthusiastic residents. The final and most demanding design assumption was: who is Bestic designed for. and honestly I do not have an answer to that problematics as it would require a time consuming work of many cross profiled professionals in the future, and far beyond the scope of this thesis. However, I discovered that Bestic is a device with inscribed functionality, which should be operated by the eating person. From my perspective I want to propose that while matching future users with assistive eating devices a high degree of attention should be put on the mental and cognitive state of the candidates, above purely physical conditions.

As I showed in the description above the process of implementation is very complex and might not go as smooth as desired. Right now none of the three chosen participants are eating with Bestic at the moment. However the fact that two master students was allowed in to investigate the subject, the fact that the eating devices was set on the national plan of implementation, the fact that Hillirød commune got interested in the affair and intensely cooperates with the head of Skovhuset to share knowledge of the implementation process of welfare technology, the fact that Bestic was out and exposed to both employees and residents alike. All this I think is a grain of sand which are shaping the future of nursing, technology and our understanding of it.

The case study was a way to investigate, how artifacts are defined and placed in a way which may imply redefinitions of everyday routines and practices in order to understand the possible resistance or acceptance of the new technology (Lie & Sørensen, 1996: 9). Formulating and catalogue proposition was a crucial part of this inquiry as I intended not only to be descriptive but in a some degree to contribute to the stabilisation of the introduction of assistive eating device as well.

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Appendix

1. Meal time puzzle



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[MEALTIME PUZZLE](#)[RESEARCH](#)[TRYING OUT BESTIC](#)[EXPERIENCES](#)[HEALTH ECONOMICS](#)



MEALTIMEPUZZLE®
Everyone has the right to a positive mealtime experience...

... Independent of age or physical dysfunction. When a person is in need for care, the mealtime may become complex depending on the extension of the care provided. A wide arrange of expertise from nurses, speech pathologists, dieticians, physical therapists, personal assistants, family members to dentists, doctors and orderlies all have to meet in order to support an individual's mealtime experience. How can these different areas with different knowledge and experience create a full picture of the individual's mealtime experience and the part each and one plays? How do they cooperate and communicate? In which way is the individual a part and a co-creator of his/her own experience?

The meal from seven perspectives

One could look at the meal from seven perspectives or seven pieces to a puzzle, where each piece has its part that contributes in order to make a whole. What questions are relevant to put forward in relation to these perspectives? What improvements are possible to put through? Is there any way that we can make the meal quality assured?

The seven perspectives are:

1. Responsibility
2. Ergonomics and seating
3. Mouth health
4. Nutrition
5. Independence
6. Social aspects
7. Appeal to all senses

From these perspectives, we have developed check lists, templates and tools that will facilitate a discussion on the topic of a positive mealtime experience.

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2. Eating environment

MEALTIME PUZZLE

RESEARCH

TRYING OUT BESTIC

EXPERIENCES

HEALTH ECONOMICS

What does the meal consist of?

There are several interesting on-going research projects about the creation of a meal and the context that involves all our senses. How does the table environment (table setting, seating, sounds, colours, light etc.) and social context (staff treatment, meal companions) affect:

- elderly / disabled persons' overall meal experience?
- elderly / disabled persons' eating?
- nutritional status and health?

A model has been developed as a tool for professional evaluation of the mealtime (by Gustafsson 2006) to define "FAMM - Five Aspects of a MealModel":

- Management control system
- Room
- Meeting
- Products (food)
- Atmosphere


The meal takes place in a room (room), where the consumer meets waiters and other consumers (meeting), and where dishes and drinks (products) are served. Backstage there are several rules, laws and economic and management resources (management control system) that are needed to make the meal possible and make the experience an entirety as a meal (entirety – expressing an atmosphere).

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3. Who can use Bestic?



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Trying out Bestic

Who can use Bestic?

How do you know if Bestic eating assistive device is suitable for a person with eating difficulties? If you or someone you know is interested in trying Bestic, take a look at the questions here below. If you answer yes to most of them, Bestic is probably a suitable option.

1. Does the person desire to increase his/her independency and activity level?
2. Does the person have difficulties with lifting or using his/her arms or hands?
3. Does the person have the possibility to take food from a spoon that is "parked" in front of his/her mouth?
4. Does the person wish to eat in his/her own pace?
5. Is the person motivated to eat by him/herself?

Certainly, there are many different reasons to why a person may need eating assistance, regardless if you are young or old. The most common reason to why people have difficulties eating by themselves is due to decreased motor skills caused by e.g. Stroke, ALS, MS, Polio, Huntington's disease and Parkinson.

Ataxia and tremor may create frustration for the person trying to lift food to the mouth which then falls off at the same time that s/he is going to put it into his/her mouth. For the elderly, the lack of energy and strength can lead to difficulties finishing a whole meal by themselves.

Other people who may be in need of eating assistance are people who suffer from rheumatism or muscle weakness and those having trouble gripping and lifting a fork and a knife due to amputation, spinal injury, brain damage or Cerebral Palsy.

What happens next?

When you have identified a person that you believe is suitable for Bestic eating assistive device, you contact us to make an appointment. We recommend that this is done in the place that the person eats his/her meals in order to create as much of a realistic eating situation as possible.

Click on the link in the blue box here to your right if you are intereseted in setting up an appointment with us.

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4. How does it feel to be fed?

MEALTIME PUZZLE

RESEARCH

TRYING OUT BESTIC

EXPERIENCES

HEALTH ECONOMICS

How does it feel to be fed?

"To feed someone is an advanced form of caretaking and demands knowledge."
- Eva Sandin, Speech Pathologist at Akademiska sjukhuset,
Uppsala University Hospital

The mealtime is an important social and cultural part of our life. We eat several times every day and in different contexts; at home, at work, in school or in a restaurant.

Due to damages or diseases one can suddenly find oneself in a situation where you need to be fed...

- How does it feel to always be fed by another person?
- To always be dependent on others?
- To have a passive role when eating?
- Constantly, every day?

Our internal driving force to manage ourselves are usually very strong. Even children have this strong desire to eat by themselves; from an early age we want to decide what we put in our mouth. Our ability to eat independently has a strong connection with our integrity and independence.

This has also been our motivation when we have developed the eating assistive device Bestic. Our goal is that everyone who wants to eat by themselves should be able to do that!

What is eating methodology?

In order to develop an eating assistive device we have really made an effort and worked intensively to understand exactly the methodology behind eating. It is something very obvious and natural, but at the same time challenging to translate into a technical solution. Through market research, focus groups and interviews we have tried to define the basic fundamentals of eating methods and tried to implement this into Bestic.

- What do we really do when we eat?
- Which pieces do we select from the plate?
- How fast do we eat?
- How do we handle the spoon, knife and fork when we eat?
- How do we manage to avoid spilling when we eat ice-cream, spaghetti or soup?
- What type of food is easy to eat and which food is difficult? Why is that so?

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5. Bestic –how does it work?

SVENSKA LOGIN

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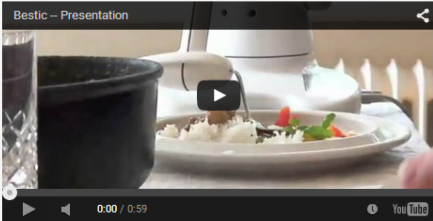
EATING ASSISTIVE DEVICE
Specifications
BESTIC SINGLE
MULTIPLE USER OPTION
ACCESSORIES

How does Bestic work?

Bestic can best be described as a small, robotic arm with a spoon in the end that can easily be maneuvered.

Bestic is small and compact, has an attractive, discreet design and is very quiet which makes it blend into the dining environment in a natural way. Bestic is easy to use, flexible and most importantly, controlled by you, the user. By choosing a suitable control device, the user can independently control the movement of the spoon on the plate and choose what and when to eat.

Bestic -- Presentation



0:00 / 0:59

TRY OUT BESTIC
Are you curious and would like to try to eat with Bestic?
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6. Aalborg implementation

Bestic

Superbrugerkursus i spiseteknologien Bestic

Den 29. januar havde vi superbrugerkursus i spiseteknologien Bestic (HMI- nr.:70880), som nu også indgår i produkter på Center for Velfærdsteknologi.

Leverandør fra Carewarecompagniet Bente Tolstrup var forbi, og give undervisning og vejledningen i en af de nyeste spiseteknologier, der kan gøre borgeren selvhjulpne i spisesituationer.

Deltagere på kurset var fagpersoner fra Ældre- og Handicapforvaltningen, Skoleforvaltningen samt Brønderslev Kommune.





Aalborg Kommune
Center for Velfærdsteknologi

<http://praksisinfo.aalborg.dk/samarbejde/kommunalt-laegeligt-udvalg?sort=date&folder=14126>

7. Tina Nielsen : <https://www.youtube.com/watch?v=EmfyHPYiJAc>




"De (spride teknologi) kan bruges de steder hvor bøger er bevist om sin situation men det fysiken setter nogle grænser for hvad man selv kan."

8. Skovhuset

Borgere

- Digital Post
- Beredskabet
- Bolig, byggeri og flytning
- Familier, børn og unge
- Integration
- Jobcenter
- Kultur, idræt og oplevelser
- Livets afslutning
- Natur, miljø og klima
- Pas, kørekort m.m.
- Skat og økonomi
- Sundhed og sygdom
- Trafik og veje
- Pension og ældre**
- Ældreanalyse 2012
- Forebyggende hjemmebesøg
- Hjælp og pleje
- Aktiviteter for ældre
- Pension
- Plejecentre og plejeboliger**
- Når du søger plejebolig
- Visitationskriterier til plejebolig
- Skovhuset**
- Nyheder
- Oftest stillede spørgsmål
- Skitse af boligen

Forside » Borgere » Pension og ældre » Plejecentre og pleje... » Skovhuset



Velkommen til Skovhuset

Plejecenter Skovhuset ligger i Hillerød Øst på Centervænget 43-45, ved siden af Region Hovedstaden (Amtsgården).

Skovhuset er et tidssvarende og nærværende plejecenter, der både er et hjem for 104 borgere og en arbejdsplads for omkring 165 ansatte, hvis ambition er et engagerende leve- og bomiljø.

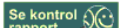
Skovhuset består af 8 boenheder med 12 boliger i hver boenhed, samt et gæstehus (afkastning) med 8 boliger. Der er dagcenter (Skovkilden) for 25 daglige gæster samt daglige aktiviteter for husets beboere.

Grundtanken med Skovhuset er at skabe rammer for en hverdag, der er kendetegnet ved trivsel og kvalitet for alle i huset; beboere og deres familier, medarbejdere, frivillige og gæster, og på den måde fortsat være med til at danne ramme om det liv, man tidligere har levet.

Det betyder, at både de fysiske rammer og organiseringen skal byde på nærvær og høj faglig kvalitet. Nærværet skabes dels af bygningen og dels gennem stabile medarbejdergrupper. Den høje faglige kvalitet sikres ved velfungerende tværfaglige teams og med løbende kompetenceudvikling. Vi tror på, at trivsel opstår i synergien i relationen mellem beboeren, dennes familie, de frivillige og medarbejderne i Skovhuset.

Vi bruger teknologi til at understøtte hverdagen med udgangspunkt i den enkelte borgers individuelle behov.

Smileys



Kontakt

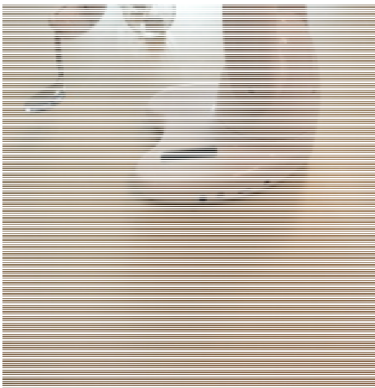
Plejecenter Skovhuset
Centervænget 43-45
3400 Hillerød
Tlf. 72326600
Fax 72326696
skovhuset@hillerod.dk

9. Welfare technologies of Skovhuset

Borgere	Skovhusets velfærdsteknologier
<ul style="list-style-type: none">▶ Digital Post▶ Beredskabet▶ Bolig, byggeri og flytning▶ Familier, børn og unge▶ Integration▶ Jobcenter▶ Kultur, idræt og oplevelser▶ Livets afslutning▶ Natur, miljø og klima▶ Pas, kørekort m.m.▶ Skat og økonomi▶ Sundhed og sygdom▶ Trafik og veje▶ Pension og ældre	<p>Skovhuset har stort fokus på velfærdsteknologier.</p> <p>Vi ønsker at skabe størst muligt tryghed og råderum for den enkelte beboer og implementerer derfor alle nye tiltag ud fra forståelsen af at tilbuddet om teknologi, altid er et frivilligt tilbud og er ud fra en individuel vurdering.</p> <p>I øjeblikket har vi;</p> <ul style="list-style-type: none">• Beboerkald der kan fortælle hvorfra i Skovhuset, man kalder på hjælpen• Smartgulv i alle boliger der registrere, hvis man falder eller har behov for hjælp• Skylle-Tørretoiletter• Spiserobotter• Armstøtter <p>Arbejdet med disse tiltag har resulteret i, at den enkelte beboer oplever, at blive mere selvhjulpne, og at vi som plejepersonale har kunnet øge kvaliteten i vores kerneydelser betragteligt, og dermed også har fået et langt bedre arbejdsmiljø.</p> <p>For at fastholde den innovative tankegang i organisationen, samarbejder vi med bl.a.:</p> <ul style="list-style-type: none">• DTU• Teknologisk Institut• Aalborg Universitet• OPALL <p>Ønskes yderligere oplysninger kontakt da venligst plejecenterleder Charlotte Kock Petersen eller ansvarlig for velfærdsteknologier områdeleder Hanne Jensen.</p>
<ul style="list-style-type: none">▶ Ældreanalyse 2012▶ Forebyggende hjemmebesøg▶ Hjælp og pleje▶ Aktiviteter for ældre▶ Pension▶ Plejecentre og plejeboliger	
<ul style="list-style-type: none">▶ Når du søger plejebolig▶ Visitationskriterier til plejebolig▶ Skovhuset▶ Nyheder▶ Ofte stillede spørgsmål▶ Skitse af boligen	<p>Se video vedr. Skovhusets sensorgulv, der kan indstilles individuelt til hver borger. Gulvet registrerer fald, men kan også bruges forebyggende til at registrere borgerens bevægelse ud på badeværelset, samt når borgeren stiger ud af sengen.</p>

Quick guide til indstillinger af **Bestic**

1



Placere **Bestic** i en god afstand fra personen som skal makes så den ikke skader brugeren i tilfælde af at den er indstillet "forkert".

Sæt passende ske på.

2



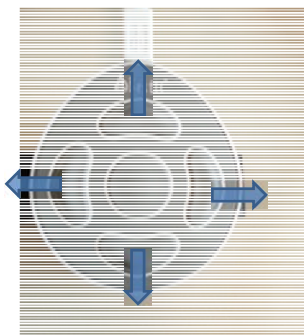
Tilslut "**Picasso mini**" kontrollen

3



Tryk på den sorte knap en gang for at tænde **Bestic**

4



Det findes følgende funktioner på "Picasso mini" kontrollen:

Op – Ned

Højre – Venstre

OK – midterste knap



Du kan nu se Brugernavnet på skærmen

Vælg bruger ved at blade til højre eller venstre på "Picasso mini" kontrolleren



Når du har fundet det rigtige brugernavn, Tryk på Ok (den mideste knap)



Tryk til venstre og i midten for at teste programmet

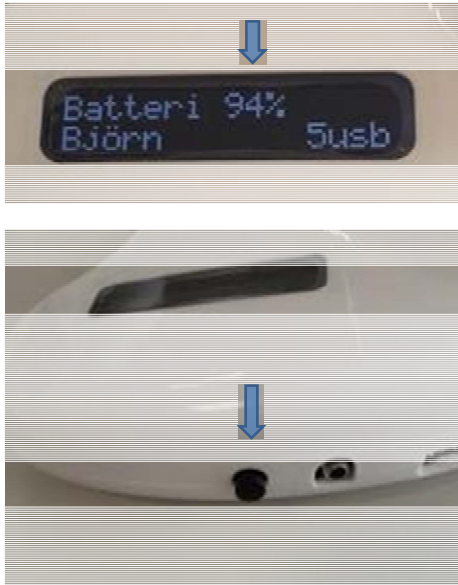
Hvis positionen af skeen er korrekt, kan maden serveres.

Hvis positionen af skeen skal tilpasses, forsæt med "**Ændre ske position**" guiden



Nogle gang spises bruen med den blå "Pikko button". I dette tilfælde tilslut den og fjern "Picasso mini"

9



Efter brug husk:

- Tjek om Bestic skal sættes til opladning
- Slukke Bestic ved at trykke på den sorte knap en gang
- Fjern og rengør skeen
- Tør Bestic-tårnet af med en blød klud eller sprit serviet