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Untimely Welfare Technologies¹

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ABSTRACT

Welfare technologies are introduced to increase the quality and efficiency of the delivery of welfare services, due to its 'time-saving' capacities. This study will examine that even though this might be the case, new technologies such as electronic floors, intelligent beds and electronic diapers, do more than this, they also introduce a time perspective of their own. New welfare technologies do not only change the rhythm and tempo of the nursing home, but they also contribute to the temporal complexity of the nursing homes. As a consequence, professional competence becomes increasingly a matter of how the individual care worker manage to coordinate the different temporal perspectives that are simultaneously at play within the nursing home. The article will argue that it is precisely the care workers ability to manage the increased temporal complexity of the nursing homes that decides what kind of care that are delivered at the nursing homes.

KEYWORDS

Nursing home / care / technology / time / system theory

Introduction

Welfare technologies has become embedded in the political discourse in Scandinavian as a way to increase both the efficiency and quality of care within the institutions of the modern welfare states, due to its time-saving abilities (Bergschöld 2018). The optimistic rhetoric regarding the new welfare technologies accentuated by governments has however been challenged by different research projects. The criticism of the new welfare technologies has been widespread. Some has emphasized the many technical problems that are related to them, which take time from the actual care (Hägglund et al. 2006; Mariam, 2013). Others describe how the introduction of new technology was perceived as a risk and a threat to the care workers own definitions of what constitutes good care (Brebner et al. 2005, Broens et al. 2007; Jansson 2007; Scandurra et al. 2005; Tinker & Lansley 2005; Wälivaara et al. 2011). Wälivaara (2009) found that the technologies can be misused, sometimes even in contradiction with the purpose of them (la Cour et al. 2016). Others point to the fact that the new technologies produce stress for the care workers (Marchesoni 2015; Melkas 2010). Again, other researchers criticized the new technologies for becoming an instrument of registration and control by the management, instead of supporting the care workers in their daily work (Hedström 2007; Hjalmarsson 2009).

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One aspect that seems to cut across the different forms of criticism is that the new welfare technologies has been contributing to the general formalization of the professional care. This is the case because the new technologies are seen as something that back up the possibilities for the care workers to follow a strict organizational schedule (e.g., fixed definitions of care and time of delivery) at the expense of the face-to-face contact between the care workers and the recipients. Thereby, the technologies challenge the care workers work ethics and attempt to deliver meaningful care and diminishing the recipients' possibilities for deciding upon their own conditions of life (Bergschöld 2016, 2018; Hjalmarsson 2009; la Cour et al. 2016).

In this way, the new welfare technologies inevitably become part of the general tensions between care institutions need for strict work schedules in order to secure the efficiency and quality of delivered care and on the other side the need for flexibility in the interactions with the residence (Abbot et al. 2016; Abbott et al. 2017; Hurtado et al. 2016; Kolanowski et al. 2015; Parker et al. 2018). As a consequence, the new technologies have been criticized for contributing to the same kind of 'objectification' of the recipients of care, as the schedules have been accused for, when they have been condemned for reducing the elderly to nothing but passive bodies that can be moved around at the nursing homes discretion (Kitwood 1997). Such research findings point to the need to match the technologies and provide dignified support to the lives to elderly through affirmative, person-oriented and relational care. In this context, the research emphasizes the need to see elderly as 'whole people' who need time and resources for communication and personal care (Heggstad et al. 2015). It is a question of seeing the individual elderly 'as the one he or she really is' (Nåden & Sæteren 2006; Rundquist & Severinsson 1999). This is why present care institutions hear calls for 'slow nursing', which is about allowing the care staff to be present in the situation, do one thing at a time and provide the individual with a sense of 'being seen' and of having 'enough time' (Heelleberg & Hauge 2014; Lillebroken 2015; Lillebroken et al. 2015).

The concept of 'slow nursing' points to the fact that time seems to be moving too fast. There is no longer time for the time of interaction. This criticism has been closely related to another, which is that the schedules and the introduction of new welfare technologies have meant that the care personal have gradually lost any influence on the content of the care. The function of care workers has been reduced to simply following the schedules or listening to the technologies and doing what they prescribe rather than spending their time interacting with individuals and deciding what type of care is needed (Bachmann 2011; Barnes & Henwood 2015; Marchesoni 2015; Marchesoni et al. 2015; Timmons 2003). This creates a gradual undermining of the need for empathy, receptiveness and sensitivity to both the verbal and nonverbal communication of the elderly (Pedersen et al. 2008a, 2008b; Slettebø et al. 2010).

The above-mentioned research has provided clear evidence that even though the impact of the new welfare technologies is far from straight forward, they often contribute to the ongoing formalization of care within the different welfare institutions. This article will focus on yet another important aspect of the technological development that until now has been neglected, namely that the technologies also introduce to care their own perspectives of time. Each technology adds a timely order to already existing conceptions of 'time' within the nursing homes. Instead of becoming merely an extension of the institutions' formal schedules, each technology contributes to the general temporal complexity of the nursing homes, and put pressure on the daily care workers ability to

manage and coordinate the different temporalities of the nursing home. The article will argue that it is precisely the care workers, who have the actual care responsibilities, who manage the different temporal perspectives, which become essential for how care is constructed.

The Danish context

Over the past decade, a number of new welfare technologies have emerged on the scene in the context of care work practices in Danish nursing homes. Intelligent beds, sensitive floors, electronic diapers, GPSs and automatic toilets are just a few new technologies designed to make nursing home care work easier. These new technologies are ascribed many different functions. They contribute to increased independence for residents, ease the care responsibilities of the care staff and create a more cost-effective administration model. The objective is to cut the Gordian knot to allow more residents to receive more welfare for less money.

It is interesting, however, that when technologies are introduced it is precisely accompanied by the explanation that they will free up time for more interaction with residents (Local Government Denmark 2015; Ministry of Social Affairs 2010). The website for the Danish Agency for Digitization notes that the development of welfare technologies ‘are intended to increase citizens’ level of independence as well as free up time for employees’ (Danish Agency for Digitization 2016). Former Minister of the Interior and Social Affairs Benedikte Kjør justified a DKK three billion investment by arguing that, ‘the new technology will free up more time for close and personal interaction, which can never be replaced by technology’ (Kjør 2011, own translation). And as the Ministry of Social Affairs noted: ‘When used in the right way, many technologies will free up time while also improving the working environment of employees’ (Ministry of Social Affairs 2017: 7, own translation). Time, or more precisely saving time, remains a central argument in the discussion of welfare technologies.

This article seeks to challenge this conventional understanding of the relationship between technologies and time. Generally, time is understood as a continual, irreversible and measurable stream of moments, which disappear as soon as they come into being, and without any instruction other than the fact that time is passing. Our approach challenge this understanding and focus instead on how time is constructed differently within nursing homes, due to their different use of schedules, interaction and welfare technologies.

Methods

The methodological premises have been clearly defined by the aim of our study. With the study, we have had the intention to focus very narrowly on one small part of a broader problematic concerning present structural premises for delivering care. Our study focuses on how managing time to a larger extent than before is part of managing care. This problem orientation was developed from the first pilot observations in three nursing homes. Here, we observed how time has structuring qualities related to care, how plural technologies pluralize time structures, and how time is a social emergent

entity where at the one hand the time technologies have structuring effects to the activities of the care givers and takers, but at the other hand the technologies are also exposed to rearrangements from the care participants. To cut short, with a prior knowledge that a wide range of technologies had been introduced to the care sector recent years, we were interested in the interplay between technologies and care workers in the management of care, this interest was deepened in the direction of time by our observations in the field of elderly care where we became interested in the relation between time and care, and how different conceptions of time has impact on what kind of care that are delivered. After our first engagement with the field, we gathered information about this through interviews and field observations. First, 12 interviews have been conducted over the period from 2013 to 2015 with managers and staff in five nursing homes located in five different municipalities in Denmark. Initial readings and analysis of these interviews have resulted in identifying general theming of the data, and a general awareness on time issues related to the implementations of new welfare technologies.

Second, we decided to make use of the research technique shadowing, which make it possible for an observer to follow a care worker through their caring for the patients, their coffee breaks and all the other tasks performed, observing everything the employee does and says (McDonald 2005). Two care workers were followed for a single day twice within the same nursing home. The shadowing was taking place from September 2015 to March 2016. Extensive notes were taken from the observations especially on the time issues that occurred doing the working day.

Third, in the light of the information provided by the shadowing and the field notes (Spradley 1979), three interviews were conducted, two with the shadowed staff and one with their managers. These interviews were structured around certain themes and observations, but the person being interviewed had a high degree of freedom in how to talk about the chosen themes. In this way, the interviews were semi-structured, which represent a very flexible technique for small-scale research (Drever 2015).

The chosen nursing home was selected because it is well known for its implementation of new welfare technologies. The two care workers were, however, selected by their managers. This obviously opened a potential bias that the two care workers were too positive concerning the use of technologies, as technologies are a pivotal concerning of the managers. The researchers did not, however, consider the risk of positive bias to trump the positive qualities of choosing care workers, who were outspoken and had a long experience working at the nursing home, and therefore would have no problem with being studied closely while doing their work and afterwards interviewed.

The method we have used is what Pink and Morgan (2013) has called a short-term theoretical informed ethnography, in this kind of ethnography work 'the focus is sharper, the research questions need to be responded to more firmly and data collection and analysis intertwined' (Pink & Morgan 2013: 357). In contrast to conventional long-term ethnography, we did not have time for 'hanging around, waiting for some things to happen', instead we introduced both the managers and the care workers to the project and stated clearly its intention to investigate how the question of time has constitutive effects on the care that are delivered. In this way, we put the project and its ambitions at the center of the activities from the very beginning, which according to Pinker and Morgan is characteristic for short-term ethnography (Pinker & Morgan 2013: 355).

Informed by the first round of interviews with managers and staff from five selected nursing homes from different municipalities in Denmark, we developed our interest in

the relation between time and care. This gave us the possibility to sharpen our focus and develop our research questions so they responded more firmly to the data collection. The field notes make it possible to develop questions at the second round of interviews into how time and care influenced each other in practice. At the end, the fieldnotes and interviews were coded in respect to any references to time. These codes were then reviewed to determine if time issues occurred in any particular types of situations. Three different categories were noted between schedules, interaction and technologies, and the data were reviewed and each information was assigned to one of them.

Luhmann's understanding of caregiving organizations, technologies and time

The temporality of technologies has become a central issue in sociology and many studies within the social studies of science and technology (STS). From different fields, researchers have described the relationship between technology and time (Adam 2004; Castells 1996; Castells et al. 2007; Urry 2000; Wajcman 2008). It is beyond the scope of this article to address these perspectives. Instead, the focus will be on the work of the German systems theoretician Niklas Luhmann and his theory about organizations, technologies and temporality. Luhmann's work is in line with the paradigm of network theories (Baecker 2003: 206). For example, Luhmann and STS has been compared. On the ontological level are no differences between them. Both theories understand technologies as being part of the constitution of the social. We will however not address this issue any further, while this has been done previously (see, e.g., la Cour 2011; Taschwer 1996; Thygesen 2012).

Instead, we will turn to Luhmann's work because it makes it possible to observe not only how nursing homes represents organizations that are closed around their own definition of care, but also how they develop their own form of temporalization in order to function as care institutions. With the help of system theory, we can zoom in on how different conceptions of time not only coexist and thus create their own internal temporal complexity, but also impact how meaning is created about care within the nursing homes.

In nursing homes, the question of temporality concerns a relationship between problem solving and need. The call in care work to meet an immediate need, as it has been presented, is shaped in a way that allows the system to organize multiple tasks at the same time. Luhmann speaks about distinctions such as before/after, early/late and quick/slow in the context of the temporalization of the present, which allows the care to be established in relation to a meaning horizon that specifies what serves as need and therefore as legitimate intervention (Højlund 2009; Luhmann 1975; Moe 1998).

According to Luhmann's theory of social systems, an organization is a system, which closes itself around itself and establishes a boundary between itself and its external environment by creating predictable decision structures. Thus, a person who enters an organization is rarely unsure of the kinds of decisions that are being made in that organization: whether they are economic, legal, scientific or, as in our case, care related. This is why Luhmann describes organizations, as systems designed to absorb uncertainty by establishing premises for decisions, which makes it possible to direct expectations at them (Luhmann 2016: 656).



From such a perspective, the individual organization consists of nothing but communication, whereas people's physical bodies and consciousness remain in the organization's external environment. Organizations are unable to communicate with their external environment, and can only communicate about it. For a caregiving organization whose primary responsibility is to care for the biological and psychological wellbeing of a select group of people, the challenge is to define what counts as need and what does not. How can the organization make itself sensitive to people's many physical and psychological needs when the organization is without any immediate access to their bodies or psyches? Since a care organization is unable to intervene in its external environment or achieve direct contact with it, it has to establish its own premises for deciding what counts as a need. Thus, the definition of need is a construction, which happens on the system's inside, and which the organization can employ to make expectations predictable.

According to Luhmann, organizations can reduce complexity through its use of programs that define what to do and when (Luhmann 2000: 248). In a care-based organization, such programs are called schedules, which decide in advance what will count as a need and how and when this need is to be met. Schedules focus on standardization and prediction because they reduce complexity by defining everything in relation to an established framework for when to do specific tasks, what constitutes a need and who is responsible for meeting an established need and when. Schedules thus represent their own way of translating an undefined welfare promise about care into fixed premises for assistance (Højlund & Højlund 2000).

But care organizations also employ interaction as a particular method to create expectations. According to Luhmann, interactions mean that the concrete encounter between individuals creates a person-dependent and situational approach to complexity (Luhmann 2016: 644). In this context, the process of defining need takes place on the basis of premises that develop in the encounter between a care professional and an individual care recipient. This means that the definition of what counts as need cannot be defined except through the personal contact between the two people. Thus, while the schedule might suggest a certain intervention or form of care, the situation might call for a different response, which seems more important. Interaction represents an entirely different approach to handling uncertainty (Højlund & la Cour 2003).

In addition to schedules and interaction, technologies, according to Luhmann, represent a third way of reducing complexity. Technologies establish couplings of repeatable causality according to the formula 'A leads to B, which leads to C'. Technologies thus serve as a specific form of simplification and complexity reducing tool that organizes the world according to an unambiguous formula. In doing so, any technology defines a need in its own particular way.

Observed as a whole, the new technologies rely on a specific notion of causality, which both legitimizes their use and makes the technologies effective in handling complexity. The technologies can accurately and precisely register deviations and are build around repeatable procedures. All the technologies are designed to zero in on a clearly delineated area of care – for example, the intelligent bed registers the resident's movements while in bed, when the resident needs to be turned over next and how long since the last time it was done. And at the same time, and just as significantly, the individual technology excludes any other considerations. The technologies can register events repeatedly without regard for the residents' general condition. In other words, the

technology will continue to work as intended despite what else might take place in the nursing home or in the lives of the residents. This kind of technology creates individualization and specific attention to singular events in the context of the individual resident's situation in the here and now.

Like any other social system, a care-based organization does not have the capacity to respond to everything that happens in its external environment. A nursing home, for instance, is unable to respond to every event produced by the psychological or biological systems of its users with its own and internally communicated effort. Therefore, such organizations have to organize their way out of their own complexity inferiority by zeroing in on a few select areas and ignoring or mobilizing indifference with respect to other areas (Luhmann 2000). In this effort to organize this kind of controlled sensitivity (and indifference), time becomes a scarce resource. Without this scarcity of time, it would be easy for organizations to allow both programs, interactions and technologies to structure the content of their care. But because this is not the case, care organizations have to construct their own temporality, through their very use of programs, interactions and technologies.

This means that time does not exist as an objective resource, but that it is assigned meaning through particular observations. Or in other words, there is no such thing as observer-independent time. In the following sections, we will discuss how our method of short-term and theoretical informed ethnography has made it possible to develop three codes of investigation, namely how programs, interaction and technologies construct time differently at a nursing home.

The temporality of care schedules

Nursing homes use schedules to implement and standardize the definition of needs among their residents. This is a central and significant precondition of the nursing home's organization of care. Schedules master the problem of time through planning, routinization and programming. Here, care emerges as a result of scheduled planning. Schedules structure care as series of person-based relations that succeed each other. The time for personal care follows the time for morning wake-up routine, which is further adapted to the schedule for the change from night shift to morning shift, which is further related to the kitchen's preparation of breakfast, which is scheduled to accommodate the fact that those with dementia eat at a different time than those without. Get up – toileting – hygiene – breakfast – walk – lunch – therapy – dinner – medicine – getting ready for bed – lights out – turn over during the night – get up. Time is structured according to a strict before/after schedule: Not until one task has been carried out, can the next one be completed. This establishes the nursing home's specific and tight time coordination. Everything has to happen just in time.

As we can see, a lot is in play here. Residents' need to get help out of bed, showering, toileting, brushing teeth, eating and taking their medication appear as needs within the organization precisely because they are included in a schedule that describes when certain tasks are to be carried out. Thus, there are schedules that determine bedtime and wake time (sleep schedule), when toileting takes place (toileting schedule) (see also la Cour 2011), what kind of medication to give and when (medication schedule), and which health-related tasks to perform when (health schedule). These schedules are all



synchronized by means of a daily schedule. We have included the most important care schedules in Table 1. The table is based on observations made by us during visits to nursing homes in 2015–2016.

Table 1. The most important care schedules.

Schedule	Routine	Time
Sleep schedule	Schedule for individual sleep routines	Time rhythm based on observations over a 2-week period
Toileting schedule	Schedule and sequencing of individualized care adapted to circadian rhythm	Circadian rhythm based on information gathered over the course of several months
Medication schedule	Scheduling of 24-hour period into a morning, noon, evening routine	Individual rhythm based on monthly observations
Health schedule	Scheduling of the total needs of a resident per week	Individualized time
Day schedule	Scheduling of total need of resident for a 24-hour period	Time adjusted in relation to nursing home's other routines

Each of these schedules creates certainty, because it implies a structure that can be anticipated. Each schedule introduces a clear before/after distinction that relates to a specific aspect of the care. The care worker knows that when he or she begins a shift on Monday morning, each of the schedules has contributed to a comprehensive plan for what needs to be done, who is responsible for doing it and how much time should be allotted. As one care worker puts it: 'It is nice to start the day with an overview of the different task for the day'. Or as a manager explains it 'Without this plan it would be impossible to organize the activities and make effective use of our scarce resources' (2016). The schedules provide a temporal perspective on the basis of which the system then structures its many tasks and which allows the care staff to master the immediate 'presence'. Thus, the schedules produce expectational certainty. The staff knows when they are expected to show up for work, they know which tasks to carry out during the day and they can expect to have an appropriate amount of time to carry out their responsibilities. Schedules are effective because they provide the nursing home with a sense of mastery of its time in the sense that the many needs can be met through predetermined expectations that allow the organization to feel that it is staying one step ahead, is prepared and focused.

Schedules construct time by making a distinction in the present between a before and an after. This means that multiplicity actions are expected to have happened before the present and more are expected in the future. The now becomes the place that establishes a link between what has already happened and what is going to happen. Put in abstract terms, we might say that the schedules turn the present into the past of particular future presents. This special form of temporalization of work tasks has created an efficient nursing home, which makes it possible for its staff to coordinate the many tasks by scheduling its care in order to maximize the efficiency of the nursing home through standardization, prediction and control. However, the different schedules establish different temporal horizons. As the table above shows, health schedules typically work

with a temporal horizon of one week, which means that the staff plans activities one week ahead, and then a new schedule will have to be made. The toileting schedules rely on careful observation of an individual's rhythm over the course of several months, whereas the medication schedules look at one month at a time. The schedules share the fact that they all construct their own cycle of repeatable temporal sequences, which consist of tasks that are followed by other tasks. Observed from the perspective of the distinction before/after, a care task never appears in isolation but only as one task in a sequence of tasks. Thus, individual tasks can only be understood on the basis of the distinction between before and after.

When everything runs as intended, one gets the impression that the nursing home is capable of preempting any potential need – as if the organization knows what is needed before it is needed. Shadowing a care worker throughout the day, on a day when everything seems to go as planned, one gets the sense that anything that happens is in accordance with the organization's wishes and expectations. This makes an unpredictable future appear predictable, because it appears as if the nursing home is able to know in advance what will happen next.

And yet, the nursing home has to operate on the basis of the notion that not everything can be synchronized and not anything unexpected can be anticipated. The more complex the specific level of care, the greater the need for synchronization and the more concerned the organization will be with everything that resists control. The desire for control increases the number of events that are perceived as deviation or mistakes, for example, if something is done 'too soon' or 'too late', and the system becomes increasingly sensitive to 'surprises', 'disruptions' or the unexpected (observation notes). Maybe one resident is in a bad mood and refuses to put on her compression stockings, which creates a delay in the sequencing, or a wound needs redressing, even though, according to the schedule, it should not have to be done for another few days. These kinds of events can easily upset the organization because they cause disruption and delays in the strict time management program. Or as a care worker explains: 'Sometimes things just take longer time than expected ... Then I have to make a decision, because there is not always time for everything' (2015). However, this is also how the system learns: through observation of deviations, the system learns to adjust the content of the schedules.

The temporality of interaction

Interaction between care workers and residents happens simultaneously with the temporal mastery of the schedules. This form of care practice is not organized around the way schedules define need and time limits, but around notions of personal intimacy and care.

To a great extent, today's nursing homes have reduced their reliance on direct and personal interaction, precisely because it is time-consuming and because it complicates the synchronization of many different care tasks. This does not mean that the care staff is not in contact with the individual residents, but it means that the care has been defined and structured in advance by means of schedules and not in accordance with the actual encounter between care worker and resident and their decision about what would qualify as meaningful care given the situation. For the nursing home, there are great temporal benefits to the fact that the individual care worker knows in advance which services to perform and therefore does not have to spend time asking the resident and use the



premises of interaction to decide what will count as a need today. In other words, the schedules have freed the care system from the inevitably time-consuming oral and personal reliance of the interaction.

This does not mean, however, that interaction has disappeared from nursing homes. In the observations and in the interviews, it was obvious that certain needs still find their justification in the personal contact between care worker and resident.

Often, the small disturbances, you know for example an inhabitant who feel small itches all the time, will be related to cognitive disorders or something with the psyche. Here I have to consider. But it is important to remember that for the resident it can be experienced as a big thing. But on the other hand, it is also not very nice (for another resident, red.) to be left in the middle of a morning routine. (Care worker 2016)

This quote clearly demonstrates an interaction-based decision-making performed by a care worker. She decides from interaction-based information. On this basis, interaction establishes its own form of temporality, which relies greatly on personal time. Both care workers and residents have their own individual way of managing time: their personal temporality. Some care workers experience stress sooner than others, some will skip one service in order to be able to get to another, while others strive to make time for both. The same applies to the residents. Some residents will object if they find the care to be too quick, others will have an easier time accepting the schedule. If we pay attention to the difference structuring the interaction's construction of time as it plays out in the personal encounter between care staff and residents, it is no longer the before/after of the schedules but rather a concept of time, where time is something one either has or has not.

Unlike the schedules, where the individuality of care workers plays a secondary role because the organization of the work operates independently of who the specific care worker is, interaction depends entirely on the individuals partaking in the interaction. Some care workers rush through the tasks while throwing a quick glance on their watch, indicating that time is a scarce resource. Others send the signal that there is time and thereby invite social interaction. Similarly, the residents may indicate their interest in spending time with the care staff, for example, by following the care worker into the laundry room to chat. Other times, residents can seem reserved and might prefer to be left alone. But when time is constructed as something that is available to both parties and that they would like to share with each other, then time is constructed on the conditions of the interaction itself, and the interaction lasts until either the care worker or resident feels that they are out of time. Or in the words of one care worker:

Sometimes when I feel like I'm ahead of my schedule. ... I usually spend time with the resident in a different way (...) We might sit down together and look at some pictures ... or hold hands or some other thing that I usually do not have the time to do. (2015)

The result of this interaction is a unique form of time, which is tied to the specific interaction's construction of what there is time for and what there is not. This temporal construction shows up in our interviews in statements such as: 'Sometimes I find the time to ...', 'Then we decide that it is time for ...' or 'It's a matter of seizing the moment'. The interaction develops its own understanding of time on the basis of its own conditions.

The rationality of interaction	The care routine of interaction	The temporality of interaction
The individual resident's needs are defined on situational and person-driven terms.	The care routine is sensitive to specific and situational needs.	The allotted time is observed as something the involved participants either have or do not have.

The way the temporality of interaction is structured is thus significantly different from that of the schedules. It is not a question of defining needs in accordance with before/after, but a question of 'seizing the moment' and allowing the need to be defined by what the situation seems to call for. Unlike the schedules, problems are not constructed as 'not the right time' or 'this task has not been performed', but as 'care problems', or in statements such as, 'we need to find time for the elderly' or 'the welfare of residents is our primary concern'. Thus, the different temporal perspectives outlined by the schedules and interaction respectively create different conditions for defining what counts as a need and what does not.

The temporality of welfare technologies

We will now move on to explore the way that welfare technologies introduce a new temporal horizon into the nursing homes, which is neither focused on the before/after of the schedules nor on the interaction's observation of time as something one either has or does not have. What characterizes the new welfare technologies is precisely the technologies' ability to alert staff to needs that arise in the here and now. Through a variety of techniques, these technologies are linked to the care workers' phones, where a beeping sound alerts the care worker of an acute need. This applies to several of the technologies. As an example, a nursing home manager says of the electronic diapers:

The electronic diapers represent a minor revolution in eldercare, because they allow us to help citizens struggling with incontinence at the exact right time. The result is a lot fewer ordinary wet diapers and a reduction in the number of eczema cases. (2013)

The electronic diaper lets the care staff know if the diaper needs to be changed. A similar type of alarm function can be seen in the intelligent bed, which alerts care staff when a resident needs to be turned over in bed or is sitting up and needs help lying back down in order not to get cold. And finally, there is the intelligent floor, where a beeping sound alerts the care worker if a resident has suffered a fall or has been in the bathroom too long. A care worker explains:

It's quite wonderful that we no longer have to spend time on the many safety check-ins. If we do not receive an alert, we can assume that all is well. (2016)

Together, these technologies improve efficiency in nursing homes, according to former head of development in one nursing home:

In a large building, this means that we are able to improve efficiency in our work routines and spend our resources on care and contact. The system increases security because it



allows our evening and night guard to see if residents leave their residence. Similarly, if a resident suffers a fall, the staff is notified right away, and this increases the sense of security for both residents and relatives. (2014)

What the new welfare technologies share in common is precisely their ability to alert staff to urgent needs that require an immediate response. They are time-saving mechanisms for the staff, because if their phones do not alert them, they can assume that everything is okay in the residents' rooms and do not need to take the time to make sure that this is the case. Table 2 shows a selection of technologies.

Technology	Care routine	The temporality of the technology
The intelligent bed	The bed supports an individual approach to rest and sleep.	The technology serves as the basis for an individualized rest and sleep pattern.
Intelligent floor	The floor establishes a preparedness system for unexpected falls (alarm function).	The technology supports a here and now preparedness system within the nursing home's time management.
Electronic diaper	The diaper supports personal care by means of an alarm function.	The technology serves as the basis of an individualized rhythm in personal care.
GPS	The GPS' alarm function is part of the nursing home's emergency preparedness system.	The technology supports a here and now preparedness system within the nursing home's time management.

Thus, on the one hand, the observations made by these technologies appear arbitrary because they are a response to immediate and present needs – a fall, a toileting accident, an open door, etc. On the other hand, however, they are also managed in the sense that they can be adapted to the individual resident, which means that they respond differently depending on the specific needs and adjustments of individual residents. Thus, when the technologies alert the staff, it is a question of a structured actuality unlike the schedules, where the care staff can read a present future into the information provided by the schedules and plan the present on that basis. Instead, the technologies create a preparedness system that cannot serve as the basis of planning. By changing the programming of the technologies, the staff can anticipate what they will have to respond to in the future, but they cannot know the precise time that they will need to respond. Referencing John Urry, we can speak of this temporality as 'instantaneous time' (Urry 2000: 126): a form of unpredictable temporality, which creates a radical break with the predictable temporality established by the schedules. This time is fragmented, because it breaks time up into arbitrary fragments of events.

Welfare technologies observe time as a question about what is an immediate need and what is not. Our claim is that the technologies thereby create a focus on the nursing homes' organization of 'event time', because the technologies create events that require a response in the immediate present. The technologies establish definitions of immediate events where planning is not possible because they cannot be scheduled in advance. Instead, what emerge are punctualized events of pure immediacy. The strength of the technologies is precisely their ability to isolate specific observations and make themselves blind to anything else by operating undisrupted by any other events within the organization. The electronic diapers, the intelligent floors and the new beds send alerts

to the care staff without any concern for what might otherwise be on their daily schedule, without any consideration of whether or not a care worker is in the middle of another interaction, for example, in the process of bathing an individual or escorting an individual to dinner. The effectiveness of technologies is precisely their ability to isolate relevant operations where A results in B results in C by operating undisturbed by other meaning contexts, which is what guarantees their operational repeatability.

The schedules, interaction and the new welfare technologies represent each their own way of mastering time and allow the nursing homes to respond to different events and decide which needs to meet. We will now go on to how the simultaneity of the different temporal perspectives creates a demand for synchronization in the organization.

The synchronization of time

Precisely because schedules, interaction and technologies observe time differently within the same time – the present, and therefore simultaneously – they struggle to take each other into account, which is why synchronization becomes a challenge. If we take a look at the relationship between schedules and technologies, schedules seek to construct a predictable future whereas technologies construct the future as unpredictable. The combination of the schedules' before/after temporality and the new technologies' 'event time' introduces a double temporal tension into the care situation. On the one hand, the care has to adjust itself to the strictly choreographed time of the schedules, organized according to a before/after perspective, and on the other hand, it also has to respond to here and now information generated by the new technologies, where time is constructed through a distinction between what counts as an immediate need and what does not. Whereas the schedules relate to structures that are variable, the new welfare technologies relate to immediate events that cannot be changed or adapted to other events, because the technologies respond to events that happen quickly, in the now, and that cannot be repeated. They are irreversible, unlike the schedules and their reversible structures.

If we move on to look at the relationship between schedules and interaction, we notice a different challenge. When participants in an interaction find time for extra care – for example, when the care worker sits down to chat with a resident – this kind of interactionally conditioned care might shift the temporal perspective of the schedules and might even affect the ability to meet other residents' needs. In this type of situation, the schedules' temporal construction is challenged by the interaction, because the effort inherent in the schedules to predict the future is undermined by a temporal construction that says, 'we don't have time for that'. In other situations, different temporal constructions may serve as premises for each other. Thus, the strict and choreographed temporality of the schedules sometimes allow for interaction to take place and create its own temporality. In the same way, the welfare technologies can relieve the pressure on both schedules and interaction to act as controlling entity. Thus, the different temporal rhythms of schedules, interactions and technologies can both function as problems and opportunities for each other.

However, because they are fundamentally indifferent to each other and are closed around their own concept of time, they often produce different forms of untimeliness for each other. What counts as 'on time' in one perspective, can be perceived as 'untimely' in



another, because it seems like a disruption, distraction or outside a particular temporal understanding of a seamless care effort.

It is not easy for the nursing home management to anticipate what will appear as an untimely definition of need. Anything that emerges as ‘deviation’ is perceived from the perspective of management as legitimate, because the residents’ needs are supposed to be central to the effort and the management therefore refrains from defining in advance what is observed as untimely and what is not. Thus, there is no privileged form of time that can coordinate the different understandings of time with each other. It becomes up to the individual care worker and his or her professional judgment to determine how to handle different situations of untimeliness. Day-to-day questions – such as whether it is more important to respond to the alert from one resident’s diaper than to take time to deal with the prosthetic leg of another – require individual caregivers to be able to manage the simultaneous pressure of different perceptions of time. In the words of a nursing home manager:

I would never tell a care worker to blindly follow the schedules; my staff sees the residents as the human being they are, and they will of course make a personal judgment about what the residents need. (2015)

This statement is supported by one of the care workers:

The management does not tell us how to prioritize. They expect that we as professionals are able to assess the situation ... They would never tell us to simply follow the schedules, in fact, they expect us to be able to judge the situation and decide which needs to prioritize ... We need to be able to make an individual decision. (2015)

It would appear, therefore, as if there is no hierarchical structure among the different temporal horizons. But this does not mean that the individual care worker can freely choose which temporal perspective to apply to the definition of need. The choice of perspective has to be socially acceptable, meaning that it has to adapt to the professional and resource-based framework for the effort. Our visits to different nursing homes has made it clear, for instance, that the temporal perspective of interaction has a difficult time asserting itself in competition with the temporal perspectives of schedules and welfare technologies. One example of this can be seen in the following statement by a care worker:

There is a clear expectation that I get to all my responsibilities (scheduled plan of needs, ed.) over the course of the day, even if I feel that there are other things that need to be done as well. So I prioritize all the time ... I don’t often disregard the schedules in order to make time for something else. (2016)

Or in the words of a different care worker:

There is not enough time to deal with ... when people don’t really fit the schedules, when a resident is a little upset or feels rejected ... then I tell them that I am sorry to hear that, but that I don’t have time to listen to them. (2016)

Other times a care worker chooses to prioritize the temporality of interaction above schedules:

Sometimes I notice that someone needs the interaction, a chat about this or that thing; it does not need to be anything personal, just a bit of attention. So I sit down and talk with them as a like-minded person ... from one adult to another. This means that there is less time for someone else's needs. He will get out of better later than what the schedule says – and to be a bit cynical, it is because he does not protest. (2016)

The staff is acutely aware of the time pressure created by the schedules. The 'event time' of the new technologies sometimes seems like a disruption to the work because the technologies, not unlike requests for time made by the residents, demand the staff's attention. Any deviation is perceived as a delay – as something taking 'too long' – and disrupts the daily rhythm by pushing back scheduled tasks to a later time. Or as a staff member puts it:

I often get interrupted by an alarm ... sometimes while I'm bathing another resident ... then the alarm goes off in my pocket, and it might be that someone needs to be turned over in bed. And then I have to decide if it's ok to leave the individual, I am working with, in order to respond to the alarm. It is my call, but it's not very nice to be left naked in bed ... It is up to me to decide whether interruptions are relevant. (2016)

The routines established by the schedules do not leave much room for flexibility within the organization. This pressure makes it difficult for the individual care worker to coordinate the different temporal horizons of the welfare technologies and of interaction, even though they are expected to be able to integrate the different temporal perspectives with each other. What happens in practical terms is that the temporal logics of the welfare technology and of interaction have to adapt to the temporal logic of schedules. First of all, the schedules decide when and with whom interaction can take place, and second, they dictate how long interaction can last, which means that it does not develop its 'own time'. Similarly, the schedules determine who is required to respond to the various alerts produced by the welfare technologies, and when. Even though certain deviation from the schedules' time management is tolerated, there are limits to how great these deviations can be before the organization has to step in to correct the staff.

In this way, professional competence is increasingly seen as a matter of the individual care worker's ability to manage and coordinate the different temporal perspectives to prevent them from colliding with one another. Does a care worker rely too much on the temporal logic of the schedules, ignoring the competing temporal logics? Or is the opposite the case: that the care worker is too easily distracted by events to the extent that it affects the time management of the different schedules, which creates stress in the whole organization because the residents do not get out of bed on time, do not receive their medication on time, do not get personal care on time? Thus, the hierarchical ordering of the different temporal perspectives serve as a mechanism of self-control among the staff, since the inability to synchronize the different temporal logics will be perceived as a lack of professional competence. Or in the words of a manager:



Some staff members are better than others at managing many different things happening at the same time. The most qualified will not see it as a problem, while others will feel pressured and unsure of what to do – in which case they often stick to the schedules. (2016)

Conclusion

Although Luhmann never himself has worked with nursing homes and their organization of care, his theory never the less provides us with important conceptual tools in order to understand how different observations of time imply different constructions of need. In applying Luhmann, we are able to combine descriptions of different operational aspect of social temporality. With Luhmann, we call these combinations for ‘temporal observations’ with constitutive effects for how needs are defined within the social sphere of the nursing home.

Drawing on these theoretical insights, the article has investigated how nursing homes contain the juxtaposition of different temporalities, which each develop their own definition of what count as a need, whether it refer to what is schedules as planned, what the interaction decides as relevant or what the technology finds is urgent to do. All this is due to different forms of temporalization. Each form has fundamental implications for what appears as a need. The question is therefore not if there is ‘time enough for care’, but how various forms of temporalities define care differently.

Furthermore, in terms of system theory, programs, interaction and technologies provide not only an irreducible environment for each other, but they also function independently from one another while at the same time they depend on each other. As there is no central representation of a unity of time, there is also no place from where the different time perspectives can be synchronized. This raises the problem of temporal coordination, within a nursing home that becomes increasingly complex in relation to its temporal structure.

The temporal organization of the nursing homes, the simultaneity of its different time horizons, the necessity to adjust them temporally to each other and the impossible synchronization make time-management absolutely essential within nursing homes. The ability to manage the increasingly dynamic character of the nursing homes different time dimensions depends upon its ability to describe it. The aim of this article is to contribute to this by providing novel insight to the challenges the nursing home are facing because of its complex temporal structure. We therefor hope that our study can inspire further research interest in studying temporal complexities and the challenge it represents for the delivery of care and its management.

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