Balancing Priorities:
A Field Study of Coordination in Distributed Elder Care

Troels Mønsted
University of Copenhagen
troels.m@di.ku.dk

Andreas Kaas Johansen
University of Copenhagen
andreas.k.johansen@gmail.com

Frederik Lauridsen
University of Copenhagen
frederik.v.b.laurdisen@gmail.com

Vlad Manea
University of Copenhagen
vlad.c.manea@gmail.com

Konstantin Slavin-Borovskij
University of Copenhagen
konstantin.borovskij@gmail.com

Abstract

Within elder care, an increased distribution of care poses strong requirements on the ability of health providers, to coordinate their activities across organizational boundaries. However, existing care administration systems do not offer sufficient support for collaboration and coordination among a heterogeneous ensemble of care providers.

In this paper, we present findings from a field study of coordinative work in distributed elder care in Denmark. The purpose of this study is to further our understanding of the coordinative challenges of distributed elder care, and to inform design of new care administration systems. Overall, we found that caregivers at the care center fulfill a crucial role in prioritizing the scheduled activities in cases where opposed interests occur, which indicates a need for a care administration system, that not only supports the meticulous planning of activities, that are needed by the healthcare system, but also the work involved in balancing priorities.

1. Introduction

In recent years, it has attracted great interest from research, how health IT can contribute to the emergence of new and better coordinative practices in healthcare. Until now, the majority of studies have addressed coordinative work at the hospital and clinics, and uncovered, e.g., temporal [1,2], spatial [3], and heterogeneous [4,5] aspects of coordinative work. Also, applications of telemedicine that impose a strong element of coordination between health professionals and patients [6], as well as home care are attracting increased interest. For instance, it has been foregrounded how homecare requires good collaboration and communication in a complex network of care providers, often including healthcare professionals, pharmacists, hospitals, insurances, and, not least, the patient and relatives [7,8].

Recently, development of technology specifically designed to support elder care has received increased interest. Ignited by an aging population, new types of technology support has been introduced, including robots for assisted living of elderly citizens [9], or communication technologies to support safer and satisfying aging at home [10]. In contrast, it has received less interest, how to support collaboration among care providers involved in elder care. This is challenging, as elder care requires the coordinated effort of a heterogeneous ensemble of care providers, including healthcare professionals, pharmacists, hospitals, insurances, as well as the patient and the relatives [7,8]. As these actors often harbor diverse ideas and attitudes towards the common activities, collaboration in elder care requires that activities are carefully articulated [11]. In elder care, like other types of distributed care, it is therefore important to support articulation work, or the extra-ordinary background work such as planning, coordination, delegation etc. that enables the primary work to be carried out [12].

It has been argued that common information spaces [13], such as central archives, hold significant potential for augmenting collaboration in elder care [14,15]. Yet, relatively few studies address how collaboration among heterogeneous, distributed, and relatively autonomous care providers involved in elder care can be leveraged by IT-supported coordination of care, or which specific challenges this involves.
In this paper, we present findings from a field study of coordinative work in distributed elder care in Denmark. The aim is to develop an in-depth understanding of the coordinative practices that are currently not well supported by IT, to guide future design of new collaborative systems and to contribute to CSCW theory on coordination.

2. Coordination of Healthcare

Studies of how IT can support people in coordinating and articulating their work, not least in healthcare, are arguably a raison d’être for Computer Support Cooperative Work (CSCW) [16].

According to [17], coordinative work is fundamentally constituted by individual actors who, in their individual activities, also change a common field of work. But collaborative work does not just happen, and particularly not in elder care where many actors often influence on a highly dynamic common field of work. In order to achieve collaboration, the involved activities must be coordinated, or articulated.

The notion of articulation work is derived from the seminal work of Anselm Strauss, who established the notion of articulation work, to describe how people schedule, align, and coordinate interdependent activities [12]. This theory has been widely applied in studies on collaborative work in healthcare, for instance to foreground how health professionals need to articulate their activities both locally and globally [18]. However, the theory of articulation work pays less attention to the characteristics of the artifacts that mediate these interdependencies. Here, the theory of coordination mechanisms has been particularly influential. This represents an attempt to hinge between a definition of coordination, and the actual design of artifacts that can decrease the complexity of distributed work. A coordination mechanism is defined as “(…) a specific organizational construct, consisting of a coordinative protocol imprinted upon a distinct artifact, which, in the context of a certain cooperative work arrangement, stipulates and mediates the articulation of cooperative work so as to reduce the complexity of articulation work of that arrangement.” [17]. Common to these theories is, that they assume that coordination, given the right circumstances and by being supported by proper tools, can be achieved. However, some studies suggest that coordination is not always achieved through direct manipulation of a common field of work. For instance, coordination can be achieved by avoidance, or by not doing things, for instance in order to ensure that routines are not unnecessarily interrupted [19]. As argued by [20], improved coordination may not only be about increasing the coupling in collaborative work settings. Improved coordination can very well be achieved by fine-tuning, aligning, and articulating relationships, and so to speak by bringing them apart. This is possible as the interdependencies among actors involved in collaborative work can be quite different. As argued by [21], these interdependencies can be described as prerequisite (when the output of one activity is required by the next), simultaneity (when more than one activity must happen at the same time), and shared resource (when the same resource is required by multiple activities). In cases where activities do not necessarily happen at the same time or at the same location, and instead form a prerequisite of one another, improving coordination can then become a matter of synchronization, scheduling, and time allocation [20]. Furthermore, rationalization is not only about fine-tuning activities and making them happen more timely. Rationalization can just as well be achieved through segregation (to make things independent by grouping similar things, e.g., tasks, and removing connections between these groups) and standardization (to make activities, artifacts, tasks etc. uniform in different settings) [20].

Yet, we argue this does not fully capture the challenges involved in achieving coordination in healthcare, not least in elder care, as people often do not fully agree on the premises of this coordination, in particular not when care exceeds the boundaries of one organization. As argued by [22], health IT design is generally challenged by some level of opposition between the perspectives of health professionals and patients. On one side, health professionals typically see care as episodic events that take place, and require a great deal of structure and planning. On the other side, for patients, care is typically ongoing and integrated in daily life. Health IT must therefore be designed to both be fit for life and care [22]. In elder care, we argue, this challenge is no less apparent. Here, the residents are supported in receiving care and in living their daily life, and the caregivers are responsible for the challenging task of coordinating and balancing these activities.

In this paper we present findings from a fieldwork of coordinative work in distributed elder care. Overall, we found that the caregivers fulfill a crucial role in balancing the interests for care and life for elderly citizens. However, in many cases, their work is not well supported by the existing care administration system, as this does not provide them with information about the priorities of the involved actors. We therefore see a strong need for developing
a common information space that conveys information about the requirements, wishes, and priorities of the involved actors, including clinics, dentists, bus transport, and relatives.

3. Research Setting

The study presented here has been carried out in a municipality in the capital region of Denmark. In this municipality elder care is distributed across numerous institutions, each providing their dedicated contribution to the ongoing life, care, and wellbeing of the elderly citizen.

In this study we have in particular focused on the work at the care center. Here, the daily activities typically follow relatively consistent routines. The tasks involve managing the residents’ appointments with the activity center, with external care providers, and with relatives. These appointments are managed by using a care management system meant to keep schedules of the activities for each resident. While this system in general provides good support for care management at the care center, the caregivers experience some challenges when they have to reschedule events during the day, in particular when this involves that the caregivers coordinate this change of schedule with other care providers and when it requires them to reschedule the transport of the resident. In this project we therefore set out to explore how caregiver in elder care coordinate changes of events with other care providers in the heterogeneous network of actors that constitute elder care.

3.1. Research Methodology

The study presented in this article has been conducted in conjunction with a design project following the principles of participatory design [23,24]. While the overall aim of this project was to develop improved IT-support for administration and collaboration in elder care, this paper reports on an exploratory, ethnographically inspired study [25] aimed to support a related design study by providing in-depth insights into the coordinative work that takes place in distributed elder care. In the early phases, the study mainly focused on coordination of care internally at the care center, while it later became more focused on coordination among members of the distributed care regimen.

3.1.1. Data Collection. Data were collected through ethnographically inspired fieldwork. Approximately sixty hours of observation, distributed over fifteen field visits conducted over the pass of three months, were conducted by four of the authors, who followed the caregivers and other actors around in elder care, to observe their work. The observations had their point of departure at a care center, but also covered three different activity centers at different physical locations and a patient transport, to cover a relatively full spectrum of elder care. Typically, observations started at the meeting room in the care center and then developed by following the caregivers through their activities.

To supplement the observations in-situ interviews with twenty-six informants were conducted. The interviews covered a variety of employees at the care center and the included activity center, as well as two residents, a dentist, one senior counsel member, and a representative from the IT company delivering the care administration system currently in use at the care center. These interviews were conducted either as semi-structured or informal conversational interviews. In the early stages of the study the interviews mainly served to prompt informants to articulate their own work practices, later to inquire specifically into the coordinative work.

Observations, field notes and sketches were taken throughout. Likewise, in-situ interviews and semi-structured interviews were documented with detailed notes that were elaborated immediately after the interviews. Moreover, various documents were collected during the study period as well as settings were documented using photographs.

3.1.2. Analysis. Following data collection, all data has been analyzed and categorized through open coding and axial coding [26]. All authors have participated in reviewing the data, which included reading partially transcribed interviews, reading field notes and studying collected documents. During data review a preliminary set of codes was developed and then discussed by the authors, and clustered around the same underlying topics. These codes are not based on a quantification of the data, but were chosen because they were the ones most often found in the empirical material across multiple interviews and observations.

5. Distributed Elder Care

In the municipality of our study, elder care is distributed across numerous institutions. The main actor is the care center where the citizens live and are supported by caregivers who provide daily care and manage the residents’ appointments with other care
providers. One of those is the activity center, where residents go, sometimes on a daily basis, for leisure and for physical exercise.

As the residents in care centers are typically elderly, they often must attend health care outside of the care center, for instance at the dentist, at the general practitioner, at medical specialists, or at hospital inpatient clinics. Because of this distributed organization of care, it is necessary to transport the elderly citizens to the individual care providers. This is taken care of by a municipal patient transport system where buses transport residents to their appointments on preplanned schedules. The general organization of healthcare, and in particular the patient transportation, necessitates that activities must be carefully planned and coordinated.

Unlike many other institutions in healthcare, the residents live on a permanent basis at a care center, while receiving care from other care providers for various conditions, including chronic diseases and cognitive impairment. The tasks here involve managing the residents’ appointments with the activity center, with external care providers, and with relatives. In our study the caregivers generally expressed that they found the concerns for the residents’ general feeling of comfort, to be of great importance, compared to, for instance, managing care or keeping appointments with other care providers. In their organization of the daily life at the care center they therefore insist to accommodate for the changes that typically happen in a daily schedule.

5.1. Coordination at the Care Center

Currently, the caregivers manage the residents’ appointments by using a care management system to keep schedules of the activities for each resident. The system is intended to be used by the caregivers, when an appointment is made on behalf of the resident, for instance with the dentist or the general practitioner.

As shown by the following vignette, the care administration system fulfills an important role when caregivers coordinate their work, for instance at the morning meeting:

The day begins with a morning meeting where all employees are introduced to all forthcoming events (24 hours), based on information, stored in the IT care system, the whiteboard in the meeting room, and personal staff calendars and notes. Caregivers plan activities for the individual resident: lunch with relatives dentist appointments, and social activities with other residents. At the beginning of the meeting the care administration system was opened. The staff read out loud all the notes that the evening team had written there, so everybody would know of any news regarding the residents. Then phones are distributed between caregivers, it is written on notes who gets what phone, as this changes from day to day (Excerpt from field notes).

This vignette shows that the information contained in the care administration system is typically discussed among the caregivers to ensure that all relevant personnel are aware of upcoming activities. This repeats during the day if unforeseen events occur, for instance if a scheduled activity is cancelled. Here the change will typically be communicated by word of mouth to the person responsible for that particular activity. Their ability to communicate new and unwritten information quickly is assisted by a clear plan for each week that describes which employee is responsible for taking care of one or more specific residents. The employees check this schedule at least once every morning and will therefore often know right away whom to pass new information on to. Coordination at the care center is furthermore aided by the fact that it is collocated with other care providers, including an activity center that takes care of arranging trips outside of the center, physical activities, newspaper readings, and hairdressing. While this collocation facilitates information coordination of care, coordinating with external care providers is more challenging.

In our study the caregivers therefore expressed a wish for a better administrative system that would enable them to plan and update a schedule of a resident’s activities, and to collaborate with other caregivers on this activity.

6. Coordination of Elder Care

While substantial amounts of coordinative work taking place within the confines of the elder center are generally well supported by the care administration system and the related practices and information systems, it is a greater challenge to align and coordinate changes in the schedules with other care providers.

One important reason is that there currently does not exist one common information space were for instance schedules are maintained. Instead, the information infrastructure of distributed elder care can be described as highly fragmented, as many of the involved care providers keep their own records
and schedules. Information is therefore not easily distributed from the care center to other care providers.

The patient transportation system is used to commute residents from the care center to other care providers or activities. This includes visits at the dentist, the activity center, and hospital clinics. The municipality also sublets the bus to other parties according to agreements outside of the care center system, and in consequence the bus schedule has been decided upfront for all bus beneficiaries. This produces a transportation system that in several ways appears very rigid, and in some contrast to the more flexible daily order at the care center.

First, the routes are the same every week, but the hours vary significantly between consecutive weekdays. These oblige each individual care center to organize its activities differently from day to day. For example, lunch or activities start later or end sooner in some particular days.

Second, the shared bus schedule forces significant time overheads upon otherwise independent centers, which cannot be worked around. Our observations revealed there is a one-hour period in which residents are picked up and dropped off at one. This one-hour at one center, along with any delays incurred by unpredictable events, accounts in minus for all other care and activity centers.

Third, the fixed bus schedule often necessitates quick departures. This drastically reduces the time for activities with the residents at the external care centers. In some days the schedule at the activity center is forcibly fragmented, while the resident spends more time commuting than socializing.

In practice, this patient transportation system critically highlights the challenges of collaborating across the boundaries of different health providers, with different ideas and accountabilities with regard to for instance the necessity of timeliness. In principle many of such challenges could be alleviated by introducing a strong segregation between the involved care providers and by enforcing for instance timely handovers through a common information space. As shown by the following vignettes, coordination is however often situated not only on the borderline between different time schedules, but also around opposed ideas about which activities are most important. This leaves caregivers at the care center with the difficult and currently unsupported task of prioritizing activities.

Figure 1 Elder Care in a Danish Municipality: The care center is the place where residents live their daily lives. They receive care at all times from the caregivers, and perform activities in and out of the care center. Specialized activities, as well as medical visits, are done outside of the care center. The residents are transported to and from the care center to those places as required. The municipality supervises the centers and the transportation.

More fundamentally, we have also found a discrepancy between the caregivers’ concerns for the life of the residents at the care center, which requires a great deal of flexibility and ability to improvise, and the other care providers’ concerns for the care, which is rather associated with timeliness. This becomes particularly visible in the interface to the patient transportation system that is stipulated by a very stringent schedule.
6.1. Coming over for Lunch

The family calls the center to make a lunch appointment on behalf of their relative, and often these appointments are not written down. When the family arrives to pick up their relative, this person is often not ready or is already seated for lunch. Dentist appointments or scheduled visits at an outpatient clinic are also forgotten. This problem is very visible, when the driver from the transport arrives to collect the resident. (Excerpt from field notes)

In this case a caregiver received a phone call from a relative who wished to visit one of the residents for lunch a bit later on the same day. This is a typical situation, and sometimes relatives also arrive unannounced. In these situations the caregiver receiving the call will either write this down in the shared notes or pass on the information by word of mouth and without taking notes. This is necessary, as the caregiver who is responsible for the specific resident will need to be informed about any changes. In some cases, because of the busy work, caregivers cannot always immediately locate one another, nor rely on new notes being read immediately. While this typically makes little differences unless the resident has other appointments, it may in some cases require rescheduling.

In this particular case, the resident was in fact scheduled for a dentist visit later the same day, which was not identified by the caregivers who therefore did not reschedule the dentist visit and the transport. As a consequence, the resident came late for the municipal patient transport and thereby missed his appointment.

This case shows how residents are often met by priorities that are not fully aligned, in this case the tight schedules of the dentist and the patient transport, and the relatives’ wish to have lunch with their family member. As the caregiver who made the appointment was not fully informed about the other activities of the resident because of inadequacies of the care administration system, she was not able to balance priorities well.

6.2. Ready for Surgery?

The idea of tying the actors in elder care closer together by introducing a shared resource of information may hold some promise for improving coordination of elder care. In many cases we have observed how poor coordination of activities may in part be explained by a lack of shared information:

One of the residents enters the room saying he is ready to get clothed as he is going to the hospital. The staff replies he should eat some breakfast first. He replies that he is not allowed to eat before his surgery. The staff looks through the IT care scheduling system, the whiteboard and their calendar. In one place it says he is not allowed to eat, in the two others it says he is allowed to eat. Staff tells him to eat and tells him they will get him ready afterwards. (Excerpt from field notes)

In this case, a resident had to go to the hospital for surgery. At the morning meeting at the care center, some confusion emerged whether or not the operation required anesthesia and consequently if the resident should show up fasted at the hospital. While the resident recalled to have heard it to be a requirement, the caregivers could not find conclusive information about this in the information systems, in this case a calendar, a whiteboard and the care administration system on the computer. Instead, they prioritized the resident’s comfortable morning and let him have his breakfast. Once at the hospital, this however proved to be an unfortunate decision. Here the health professionals informed the resident that he could not go into surgery with a full stomach. He was therefore
sent home to the care center, and the operation was scheduled for another day.

In this case, the activities of the care center and the hospital clinic were not aligned. The caregivers at the care center were not fully informed about the specific procedure that was supposed to be carried out at the hospital clinic and the requirements for this. They were not able to align their concerns for supporting the resident in having a calm and comfortable morning at the care center, with the clinic’s concern for carrying out a safe clinical procedure.

This vignette therefore brings to light an unfulfilled coordination need in the current care administration system that prevented the caregivers in prioritizing these opposed interests.

This suggests that in some cases, the mixed priorities that exist in a heterogeneous network of care providers may compromise continuity of care if they are fundamentally working with the same shared resource.

7. Balancing Priorities?

In this study we overall found a general tension between the need for flexibility to achieve in supporting the residents’ daily life and comfort, and the need for timeliness to accommodate to the rigid schedules and requirements of the bus system and the other care providers. In this care scheme, the caregivers are posed with the important, yet difficult task of ensuring that these, at times, opposed interests are balanced, so that the daily schedule of the residents is sufficiently flexible to allow them, for instance, to receive unscheduled visits from relatives, while not compromising important care activities, that often require a certain amount of precision and timeliness, for instance when the resident is scheduled for surgery.

In our study we observed how care providers at the care center were sometimes let down by their care administration system, as this did not support sudden adjustments of the daily schedule well, and often did not provide them with the information needed to assess the importance of certain activities and thus prioritize them. The second vignette showed how the rigor of the patient transportation system was in opposition to the family’s wish to improvise a visit, and how the caregivers, because of a lack of information about the upcoming dentist appointment, were not able to balance these. The third vignette described how clinical requirements, in this case from a hospital clinic, were in opposition to the daily life at the care center, but as the caregivers were not informed about the requirements of this operation they were not able to take this into account when planning the activities at the care center. In both cases the caregivers had to prioritize between apparently incompatible interests to ensure that activities in the distributed care regimen were coordinated, but did not succeed to do so because of the inadequacies of the care administration system.

It is commonly argued that the distributed care involving a heterogeneous ensemble of care providers can be supported by IT-based coordination mechanisms or common information spaces that stipulate coordination and allow health providers to share information, including schedules and clinical information, across organizational and professional boundaries. In our case we have certainly identified a potential for such large, integrated information systems to support coordinative work in distributed elder care. An integrated information system could support coordination of care by allowing the involved care providers to actively produce, maintain, and share health information and schedules. This could in principle have allowed caregivers at the care center to access information about the upcoming surgery and thereby take the requirements of the operation into account when planning the activities at the care center. In both cases the caregivers had to prioritize between apparently incompatible interests to ensure that activities in the distributed care regimen were coordinated, but did not succeed to do so because of the inadequacies of the care administration system.

One approach to solving this coordinative challenge is, as argued by [15], to change the organization of the collaborative arrangement, to remove the necessity for actively coordinating work. This can be achieved by standardizing, synchronizing, and fine-tuning relationships. In the case of distributed elder care, this could be done, to an even greater extent than in the current situation, by enforcing a stronger and more structured stipulation of the interface between the involved care providers. In the case of the patient transportation system this could be a more standardized schedule for arrivals and departures that did not change in between weekdays. In the case of a surgery or other health interventions, a stronger segregation could be achieved by standardizing the requirements for how a
residents are prepared before departure. While standardizing collaboration may not intuitively go hand-in-hand with care and comfort of elderly citizens, some degree of segregation is probably needed in most distributed healthcare regimens, and may potentially free up resources that enable caregivers to provide better care for the residents. While stronger segregation could dissolve some of the challenges observed in this study, this would mostly serve the interests for precision and timeliness of the healthcare providers, rather than the wish for flexibility of the residents. These interests, we argue, are not easily aligned in a strongly segregated system.

Based on these findings we argue that caregivers at the care center fulfill an important, yet overlooked role in assessing the importance of various activities and prioritizing them in relation to one another, in cases where opposed interests occurs. How this in practice can be achieved, remains for a future design project to explore. However, this project indicates a need to help the caregivers with prioritizing activities, for instance by providing a multiple-input communication channel, that allow the members of the distributed care regimen to add information regarding their specific activities, while making it easier for the caregivers to decide on the importance of the events in the context of other events.

Based on these findings we overall propose ‘balancing priorities’ as a guiding concept for design of future care administration systems for elder care specifically, and for healthcare in general.

8. Conclusion

In this paper we have presented findings from an ethnographic study aimed at exploring the challenges of coordinating distributed elder care, to inform design of improved IT-support. Overall we found that residents at care centers are situated among opposed and sometimes incompatible interests. On the one side, health providers such as hospital clinics and dentists require a tight schedule and timeliness, on the other side the residents themselves require a great deal of flexibility to allow for a comfortable life where, for instance, family members can come for unscheduled visits. In this, caregivers at the care center fulfill an important role in assessing the importance of the activities and associated interests and prioritizing these in relation to one another. This work, we argue, is crucial for coordination of elder care, but is currently not well supported by the care administration system and a generally fragmented information infrastructure.

Conclusively, the findings of this study therefore indicate a need for a care administration system that not only supports the meticulous planning of activities that is needed by the healthcare system, but also the need to prioritize activities in order to balance the interests of care and life of the elderly.

9. References


