Summary of the Milestone Report 3.2

Purpose

The main purpose of WP 3.2 is the analysis of the needs and requirements of the three target groups (care staff, people suffering from dementia, relatives) as well as their correlation among each other. This is the basis to find out how quality of life for people suffering from dementia can be improved. Furthermore, the aim is to identify relevant use cases and business cases.

 Determination of Research Guide

The overall research paradigm is the hermeneutic approach (Gadamer, 2004), also inspired by a phenomenological approach (Dahlager & Fredslund, 2012). The two used methods to gather the empirical data material are interviews on the one hand and participant observations on the other hand. These used methods are especially suitable to get a deep understanding of the three target groups’ values, the environment and organisation around them and the contextual conditions and factors.

The analysis consists of a decontextualisation, where field notes and transcribed interviews are taken into pieces, and a recontextualisation afterwards to bring the data material together again in a new way through reading and interpretation. This analysis consists of four steps:

1. Overall Impression
2. Identification of Meaningful Units
3. Operationalization
4. Recontextualisation and Hermeneutic Interpretation

Therefore, the concrete developed research question according to the purpose of the needs and requirements analysis is:

Where and when does assisted living technology have the potential to improve the quality of life for people suffering from dementia, care staff, their relatives and in the context of dementia in nursing homes?

The fieldwork consisting of interviews and observations has been conducted in the two German nursing homes Gotthard-und-Anna-Hansen-Stift and Pflegezentrum Techau as well as in the two Danish nursing homes Rise Parken and Blomstergården.

Research Results

Eight themes were emerged, which are identical in Germany and Denmark:

1. Life Story
2. Cognitive Memory Impairment of the Person with Dementia
3. Activities and Exercises
4. Presence of the Employees in the Daily Work
The life story describes the individual life that a person has lived and contains personal experiences as well as information about significant relationships, surroundings, people, places and times. Knowing the life story of an individual elderly person can be important for understanding the behaviour or symptoms of dementia on the one hand and for creating meaningful activities on the other hand.

People suffering from dementia have cognitive memory impairments that mostly appear as memory disorders. Often it is not easy for the relatives to handle these cognitive impairments of their loved ones. The elderly need help to remember; therefore, verbal communication but also sounds or pictures are very helpful.

Activities and exercises in life, which bring joy and inspiration, can support the quality of life of the elderly. The people suffering from dementia need structure and activities in their daily life. Physical training is as important as social events like church service, singing, cognitive training, cooking, joint trips, etc.

People in need of care have a high degree of dependence and a need for human human support in their daily lives. That requires presence of employees (care staff). The care staff spends a lot of time for the basic physical care and administrative tasks like documentation. To increase the job satisfaction of the care staff and to improve the quality of life of the people with dementia, the care staff must have more time to meet the needs of the individual residents.

To support the professional cooperation, more time for information exchange among the care staff is needed. Especially the exchange between care staff for basic care and care staff for activation should be improved. There is also a need of professional cooperation and communication among care staff, people with dementia and relatives to understand their different behaviours, experiences and motivations.

The interviews show that both - relatives and care staff - have a demand for being further educated in special topics. For care staff, there is a need for a development of competencies regarding e.g. leadership and social competences, but also competencies with regard to technology. For relatives there is a need for consultation-hours to learn more about correct reactions towards people suffering from dementia and about dementia-specific topics.

Both - care staff and people with dementia - need a good training regarding the use of new technologies. For people with dementia technology has to be intuitive, simple and easy to use. The care staff wants an intense training lead by the inventor of the technology.
Values from the care staff’s perspective contain the need to create a good and comfortable life for the people suffering from dementia with many interesting activities. Moreover, the care staff wants to treat the residents equally and wants to keep rituals.

Use Cases

For modelling the use case diagrams, which show what the actor can do with the system, the UML 2 has been chosen. All use cases have been discussed among the project partners and were presented as use case diagrams with a description. The following uses cases belong to the eight defined themes.

The use case diagram regarding life story is named information platform for care staff regarding individual life story of a person with dementia. The system should collect and provide life story data of each elderly so that care staff can receive information to understand their rituals, wishes and needs. The relatives can share important information about the resident via the system.

Information system for residents (and care staff) and holistic information system for residents suffering from dementia are called the two use case diagrams regarding cognitive memory impairment of the person with dementia. The aim of the first system is to support the memory of persons with dementia by creating a reminder with voice, pictures or video of their relatives. The aim of the second system is to give the residents holistic information / reminder and help them to have a more structured day.

The use case diagram regarding activities and exercises is named activity platform and record for elderly care, care staff and relatives. The amount of physical activity as well as social contact should be increased. The resident can receive motivating invitations via the system.

Voice recording documentary system for care staff and relatives is called the use case diagram regarding presence of the employees in the daily work. The aim is the reduction of time spent on documentation and administrative tasks. A voice and video recording system should transcribe the data automatically.

Regarding professional cooperation, the use case diagram is named information and knowledge platform among care staff. This system should support the exchange of information and knowledge for the care staff and thus should ensure a better and more constructive way of communication. Another use case diagram is an information and knowledge platform among care staff and relatives. The aim is the improvement of the exchange between care staff and relatives.

Education and training system for care staff and relatives is called the use case diagram regarding competence development. This system has the aim to ensure a good education and training regarding dementia-specific topics.
Regarding the theme technology, there is a use case diagram named information system for care staff regarding elderly care in which care staff should document their daily work activities continuously and thoroughly. This system also contains a tool to structure and plan the day as well as it contains information about the individual needs of the people with dementia.

Regarding values the use case diagram is called security system for residents and care staff. This security system should send information to the care staff, if a resident is leaving the nursing home so that they can use a tracking tool. The overall aim is to ensure a self-determined and secure life for residents and generate more time for care staff. Another use case diagram is called information platform for personal life story data for care staff that should help the care staff to better know the life story and the individual needs, wishes and rituals.

In a workshop in Odense on 15th May 2017, the three following use cases have been chosen for further considerations within Demantec because they are feasible and realistic:

1. Information Platform for Care Staff regarding individual Life Story of a Person with Dementia
2. Information and Knowledge Platform among Care Staff (and Relatives)
3. Security System for Residents and Care Staff

Due to the similarity of use cases 1 and 2, these two use cases are combined in system 1.

Functional and Requirements Specifications for System 1 and 2

System 1 – Information and Knowledge Platform

The users of the system 1 are care staff, relatives as well as the persons with dementia who are able to use the system.

Information that should be shared via the system are the life story, interests and current activities of the person suffering from dementia. Additionally, the communication among the care staff should be improved. Especially for care staff responsible for activation, this system can help to plan activities that match the individual needs, life story and interests of a resident with dementia. For the care staff for basic care the system is useful to get information about the activities and current situation of a resident and to have a better exchange with the care staff responsible for activation. Relatives can use this system to get information about current activities of their loved ones on the one hand and to give important individual information about the resident on the other hand. Furthermore, they can use the system for communication via video module and message module. In addition, people with dementia can use the calendar module, the message module and the video module of the system. When residents are not able to use the system directly, care staff and relatives can feed the system with information the residents give.
These specifications are the foundation for further development of the product Life-Manager by Life-Partners A/S. The modules on the front page of the system are contact module, message module, video module, calendar module, gallery module and menu module.

System 2 – Security System

Via sensor technology, system 2 can send alarms in case an unsafe situation occurs for residents suffering from dementia. Therefore, residents with dementia are allowed to leave the nursing home at any time. The system can send alarms via door sensors and bed sensors when residents leave the nursing home, leave their individual residence, leave the bed or fall. A digital door lock also can help to prevent residents from opening rooms that are not theirs. Moreover, residents can call for help using an emergency call. The alarms are received by an application (IntelligentCARE or Intelligent LIFE) developed by ANYgroup ApS.

The system can help relatives experience more safety for their loved one living in the nursing home, as they do not have to worry about him or her wandering around or e.g. falling out of bed. The system will help the residents to become safer, since the care staff by means of the system immediately will become aware of any potential unsafe situation and are then able to act and help the residents. Moreover, the system gives care staff room for more efficient working procedures so that they have more time to do activities with the residents or to do other tasks, especially at night.

Business Cases

The business cases were developed for the two systems to show advantages and expenses from different perspectives.

Business Case for System 1: Information and Knowledge Platform

From the company perspective advantages are the test of the Life-Manager in two nursing homes in Germany as well as the references that could be used for further entrance on the German market. Expenses are associated with the development, adapting the solution and making translation of documents for education and implementation from Danish into German language.

From the nursing home perspective, there are many advantages. On the one hand, more efficient work procedures can save time and money and improve job satisfaction, work atmosphere as well as interdisciplinary collaboration and communication among care staff. On the other hand, all staff in the nursing home is quickly informed and can use all available information for interaction with residents. Moreover, this information improve the planning for individual activities and help reminding residents regarding events or activities. In addition, relatives have the possibility to improve their communication with both - relatives and care staff. Another advantage is the improvement of image of the nursing home so that the job gets more attractive for care staff. Expenses are associated with the implementation of the
system, workshops and other meetings, personnel costs, investment in infrastructure as well as hardware and licensing software.

Advantages from the *municipality perspective* are quite similar to the advantages from the nursing home perspective, as the Danish municipalities are responsible for the Danish nursing homes. Additional advantages from the municipality perspective are the possibility to involve the facility manager via Life-Manager and that quality of life of the residents can be improved, as care staff has more time for care and other activities. Expenses for the municipalities are costs for the implementation of the system, workshops and other meetings, personnel costs, costs for 20 tablets and investment in infrastructure.

From the *society perspective*, the improved exchange of information and collaboration of relatives, people suffering from dementia and care staff are advantages. Additionally, improved relationships among them, improved quality of care, better quality of life for relatives and residents as well as improved quality of work are mentioned. Moreover, the image of nursing homes and the job of working as care staff are improved. There are expenses regarding nursing care insurance contributions or taxes to allocate money.

**Business Case for System 2: Security System**

From the *company perspective*, advantages regarding system 2 are the knowledge about the German market and further contacts. The expenses are associated with development and adjustment of the solution for the German market, establishment of a network in the nursing homes, installation of the solution as well as a workshop for staff of the nursing home. Moreover, annual costs and products are attributed to the expenses.

Other advantages from the *nursing home perspective* are that residents with a tendency to walk away are allowed to walk. In addition, there could be a reduction of residents leaving the nursing home unattended and a reduction of further dangers. Moreover, other residents should be more satisfied as residents wandering around cannot enter their rooms due to door locks. Care staff can be alarmed, if residents leave the bed and move around. Furthermore, residents can receive help whenever needed after using a manual or automatic emergency call. Overall, the work procedures can be more efficient regarding time and money. Therefore, care staff have more time for care as well as other activities with the residents. In addition, relatives do not need to worry about the security of their loved ones and the image of the nursing home can be improved. However, there are also expenses regarding the establishment of a network, installation of the solution and regarding a workshop for staff of the nursing homes. Other expenses are products and time spent on education of the care staff.

From the *municipality perspective*, advantages are also more efficient work procedures for the care staff and more time for activities with the residents. Moreover, there is less risk of residents wandering off or fallings and an improvement of the image of the nursing homes in the municipality. The expenses are equal to the expenses from the nursing home perspective.
Advantages from the society perspective are that residents with dementia become safer and that relatives will feel less concerned about their loved ones. Additionally, the improved quality of care and life as well as more efficient work procedures and an improved image of nursing homes and the job of working as care staff are advantages. Expenses could be higher nursing care insurance contributions or higher taxes to allocate money.

Conclusion

The needs and requirements of the three target groups as well as the interactions among them were analysed.

The researchers from Germany and Denmark were aligning the research by matching the way of observing the test persons as well as using a similar interview guideline in both countries. The target groups consisted in Germany and Denmark of people with dementia, relatives as well as care staff. However, alignment was not fully practicable due to the different job profiles of the care staff in both countries.

While having a personal meeting, the researchers from Denmark and Germany found out that there are eight common themes for both sides of the boarder that came out of the fieldwork. These eight themes are the foundation for the use cases / use case diagrams. According to the comprehensive results, eleven use cases were developed in order to cover all identified needs.

It was necessary to focus on use cases that are realistic to implement within Demantec. Therefore, the Danish and German project partners jointly chose three of the developed use cases. Due to the similarity and compatibility, use case 1 and 2 were combined in system 1. Afterwards, the functional and requirements specifications were developed. They can be understood as detailed description of the two systems that are able to improve the quality of life of people suffering from dementia as well as relatives and the quality of work for the employees when used in German or Danish nursing homes.

Based on former preparations, business cases were developed describing advantages and expenses for the company, municipality, nursing home and society as a whole. The two systems do not contain all research result so that more solutions could be conceivable and the results can be an inspiration for other technology providers.

For further information please have a look at the milestone report 3.2.

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List of Literature
