<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEECH RECOGNITION - FINLAND</td>
<td>3</td>
</tr>
<tr>
<td>TECHNOLOGIES OF UNDERSTANDING - FINLAND</td>
<td>7</td>
</tr>
<tr>
<td>A WEB BASED ULCER RECORD FOR COLLABORATION BETWEEN PATIENTS,</td>
<td>11</td>
</tr>
<tr>
<td>SPECIALISTS AND HOME CARE - NORWAY</td>
<td></td>
</tr>
<tr>
<td>USING REMOTE CONTROL FOR WATCHING TELEVISION - NORWAY</td>
<td>14</td>
</tr>
<tr>
<td>MOTION INTERACTIVE GAMES IN HOME REHABILITATION FOR CHILDREN -</td>
<td>17</td>
</tr>
<tr>
<td>SWEDEN</td>
<td></td>
</tr>
<tr>
<td>INTERNET-BASED ACTIVITIES, SOCIAL MEDIA AND OLDER PEOPLE - SWEDEN</td>
<td>21</td>
</tr>
<tr>
<td>TELEHEALTHCARE 2020 - DENMARK</td>
<td>24</td>
</tr>
<tr>
<td>ROBOT VACUUM CLEANING - DENMARK</td>
<td>28</td>
</tr>
</tbody>
</table>
SCENARIO #1: SPEECH RECOGNITION - FINLAND

Tomi Westerlund, Riitta Danielsson-Ojala, Janne Lahtiranta, Sanna Salanterä et co.

Actor
Salla is a 19 years old girl.

Setting
Salla had a stroke at age of 17. Due to the stroke, she has many difficulties to form, and some problems to understand, speech. It is also hard for her to concentrate in an on-going discussion and reading long texts (e.g., books). Salla has also mobility problems because of the hemiparesis; she has to use a cane when walking. Getting out and about and carrying out everyday activities is problematic, especially when she has to lean on the cane and at the same time use her paralysed right arm. She cannot open heavy doors or push the buttons of her mobile phone. She had started at upper secondary school, but after the stroke she dropped it.

Salla lives with her parents. Her mother needed to give up her career after Salla's stroke and stay home to help her daughter. They have not made any home modifications and they do not have any assistive technology products such as smart locks (speech recognition), door openers or any kind of home health devices.

Goal
Salla wants to manage on her own, live similar life than her healthy friends do.

Positive Scenario Today
Salla copes fine with her current mobility and communication aid devices. When she goes out, she uses her tablet computer, which has special applications for people with speech defect. She can tap on a picture and show it to her friends or the tablet tells aloud the selected words. Sometimes Salla writes words or draws a picture on her tablet to express her opinion, but she has to sit down because she needs the better hand to write and not be leaning on her cane. The applications are easy, but a bit slow and cumbersome ways to communicate. But within time, Salla has become fluent with her tablet and the communication applications.

At home, Salla has the courage to communicate by speech that she does not do with her friends or strangers. Her parents give her the time she needs to say the right words and gently correct her if wrong words occur. Often Salla prefers to show pictures from her special booklet rather than her tablet. Salla's therapist encourages her to speak, and she has progressed remarkably during the last year. She would like to start talking also in public places with her friends but she does not have the courage yet.

After the stroke, Salla had to interrupt her studies in the upper secondary school, but this autumn she resumed her studies with a school aid. Studies are going well, but slowly. She decided to spread the studies over five years instead of the normal three years period. Although Salla is surrounded by many students at school, it is hard for her to get to know them. Salla sometimes feels sad because she has lost contact with many of the friends she had before the stroke and she is afraid of losing the rest she has. At the moment, however, she feels excited because she has met a boy called Jarno in a cafe last week. Jarno has problems in production of speech, too, and he needs similar help devices as Salla in communication with others. Jarno has sent a SMS to Salla asking her for a date.
**Negative Scenario Today**

Salla sparsely copes with her communication aid devices. She hesitates to communicate by speech at home, although her parents give her all the time she needs to say the right words. Salla’s therapist encourages her to speak, although Salla has not progressed much during the last year. Owing to her slow rehabilitation, Salla is ashamed of showing her disability in public. She also has bad memories of being treated like a stupid when she has tried to talk in public places. Therefore, she prefers to show pictures from her special booklet, which is much quicker than her tablet in everyday situations although it has a limited amount of pictures included.

Not being able to speak or communicate fluently using the communication applications, she rarely sees her friends nowadays, which makes her sad. In those cases when she goes out with her friends, she uses her tablet, which has special applications for people with speech defect. She can tap a picture and show it to her friends or the tablet tells aloud the selected words. Sometimes Salla writes words or draws a picture on her tablet to express her opinion. These are very slow and really cumbersome ways to communicate because the usability of the applications is really poor. Therefore, not even in process of time, Salla has not become fluent with the communication applications.

Salla lost the contact with Jarno, which was a considerable setback for her. They sent some text messages and met once in a park, but the conversation was extremely troublesome when they tried to discuss via malfunctioning devices. They could not really understand what the other one tried to say, and therefore Jarno never asked Salla on a date again. He did not respond to her text messages either.

After the stroke, Salla had to interrupt her studies in the upper secondary school, but this autumn she commenced the school again with a school aid. Studies are going inadequately and really slowly, and therefore she is depressed and considering to drop the studies. Although Salla is surrounded by many students at school, it is hard for her to get to know them.

**Positive Scenario 2020**

The speech recognition and communication aid applications have improved dramatically during the past 8 years. Salla has participated in several research projects and has tested numerous application and devices, which were personalised for her. Now Salla has a communication application on her tablet that understands her speech and writes on the screen the words she tries to say or the tablet says the words aloud. If Salla has difficulties to remember the words, the tablet analyses the context after which it provides plausible alternative words to choose from. The communication application also allows Salla to talk on the phone with her parents and friends that she really enjoys. She talks to the tablet or phone and it converts her speech to more understandable language. Very seldom she has to write down words. The applications works so well that she can even use it to reserve time in the health care center or order a taxi with her speech.

Owing to the highly sophisticated speech recognition system in her mobile devices, Salla could continue her studies at the University of Applied Sciences after graduating from the upper secondary school. She uses the speech recognition system in the university to dictate her essays and exams if the text would be too long to write. Instead of reading textbooks for exams she uses the “from text to speech application” of her tablet and listens to the material as e-books.

Salla lives together with Jarno in a house where new technologies help them with the daily living. With the mobility and communication aids, they are able to run errands by themselves. They also have several speech controlled home appliances to help daily activities such as door openers, adjustable bed and electronic shower system. All of these appliances are adjusted for their speech. In her busy life, Salla is happy about the possibility to sometimes have video calls with her physiotherapist instead of travelling to the other side of the town. Administering the video camera with her voice she can show the therapist all her training programme from the detail of her finger movements to the walk training.

She keeps actively contact with her old and new friends in real life as well as in school and social media. Even the communication with her foreign friends succeeds with the translation applications integrated with the speech.
recognition system. Salla is happy. With her new devices and together with Jarno, she sometimes forgets her disabilities and she feels capable of doing all those things her healthy friends do and everything she wants to do.

**Negative Scenario 2020**
Comparing to the year 2012, nothing has changed. The communication aids have not improved her life at all during the past 8 years, although that she has participated in some research projects and tested numerous communication applications on her tablet and smart phone. One of the main reasons for the lack of progress is that there is neither money nor enthusiasm in research of brain injury to help people with speech disabilities. Salla has frustrated at her lack of progress. She has stopped with her speech therapy and hardly ever tries to communicate with speech even with her parents. Salla still lives at home with her parents and a home care nurse visits her twice a day. Her mother has started working to cover all the expenses.

The school was too hard for Salla so she has to drop it. Her main pastime is surfing the Internet and watching films. She is very disappointed with her life and does not want to plan her future in any ways.
References
SCENARIO #2: TECHNOLOGIES OF UNDERSTANDING - FINLAND

Janne Lahtiranta, Tomi Westerlund, Riitta Danielsson-Ojala & co.

Actor
Anja is a 51-year-old woman, a mother of two grown-up children and a wife to Urho, 55-years-old Computer Numerical Control (CNC) machinist.

Setting
After the children moved out, Anja and Urho decided to revitalize their beloved hobby from younger days; trekking. At first, they made short trips to the surrounding wild but after a while, they took heart and decided to make longer trips to conservation areas farther in the north, above the Arctic Circle. At first, things went as planned and the couple enjoyed the time they had just for the two of them. However, as the time passed on and they decided to take more challenging routes, Anja’s hip started to ache. At first, the pain was mild, but gradually it started to hamper their progress. Eventually, they were forced to get back and limit their hiking to the more passable areas. Over time, Anja and Urho took other trips to different parts of the wild but her pain was getting more constant, and it started seriously to limit their newfound active life. In order to rectify the situation, Anja decided to seek professional help and went to see a physician. Unfortunately, the examinations revealed that her left hip was eroded to a degree that she would need a replacement surgery.

Scenario
Anja did not welcome the news on the upcoming surgery. In the 1990s her mother had undergone the same surgery and was already in a need of a new prosthesis. Even though other clinical aspects, her mother’s rehabilitation efforts, and even the quality of the prosthesis material were the primary contributors behind her mother’s need for a replacement (which occurred nearly 20 years ago), the situation had led Anja to believe that a hip replacement surgery would eventually ruin her life and make her a cripple (anecdotal knowledge).

Her doctor’s reassurances on the developments in the field and in the materiel of the femoral component and the cup (procedural and conceptual knowledge) did not give her any comfort; she did not fully understand her current condition and changes in it in the near future, what was about to happen and how the surgery would actually change her everyday life.

Goal
Anja wants to get her hip functioning again. She wants to live the same kind of active life with Urho as before.

Positive Scenario Today
The news on the upcoming surgery had really upset her. In order to get a better grasp of things, Anja decided to search more information online. Her investigations on the matter left her baffled and unsure; she could not create an overall picture to the matter on the basis of online sources that effectively consisted of a mix of (official) patient instructions, (unofficial) discussion boards and social media. Instead of the web, Anja decided to turn to her circle friend and ask for their views to the matter. One of her friends was married to an orthopedist that was willing to interpret the current situation (and the related documentation which was riddled medical jargon) to Anja. With a help of her friend’s significant other, her fears were diminished and eventually she was willing to undergo the
surgery. Over the course of her recovery, Anja consulted her friend’s spouse from time to time; even to a degree that without their good personal relationship, it could have become a burden.

**Negative Scenario Today**

As a rather competent user of information technology, Anja decided to seek more information from the Internet and from her circle of friends. She used search engines and found her way into a discussion board in which the topic was discussed. The individual messages in the board contained personal experiences and opinions from individuals, who had, at some point in life, went through a joint replacement surgery. Anja already had strong attitudinal feelings towards the operation, and therefore she sought out (without realizing it) information that would only strengthen her perceptions on the matter. Her investigations on the online services provided by accredited health information providers did not give any real respite on the matter; even though she is a rather competent user of the information technology, her health information literacy skills were not at the same level.

As a last resort, she turned to her friends in social media, sharing her medical particulars on it. The response from her circle of friends was mixed; some encouraged her to undergo the operation while others only strengthened her original attitudes on the matter by sharing negative experiences (that rarely were of their own) on the matter and even on the assigned health service provider unit.

Fearful, anguished and in pain, Anja decided to postpone the operation until further notice, silently suffering from her condition that was gradually worsening. Her condition also degraded her relationship with Urho since the level of intimacy they used to share in their relationship was no longer an option. Months later, Anja also noticed that the medical particulars she had shared via the social media were now the property of the service provider, leaving her unable to remove them.

**Positive Scenario 2020**

As a competent user of information technology, Anja decided to look for more information on the matter. The first thing she decided to do was to look into her personal health information repository. The service contained her official health documentation from the service provider that were proofread and set to a timeline. In addition, she had alternative versions of the documentation that was ‘translated’ for her use, devoid of any professional jargon. There were, however, portions of the documentation she did not fully understand. To get more help, she decided to ask for more information via the online patient information service, which was implemented as a real-time video conferencing system accessed via her health information repository. The online consultation with a health care professional helped her to understand that her case was different from her mother’s. While her mother’s operation was a total hip replacement surgery, her upcoming operation would be a surface replacement surgery that would be different on the thighbone side. Her consultation with the professional also helped her to understand, to a sufficient degree, what were the relevant recent developments in the field and in the materiel of the femoral component and the cup.

Anja had also other concerns she was unwilling to discuss with the professional via a face-to-face connection. She decided to present her other concerns to a patient decision support solution that would give a feedback to her stepwise progressing interactive analysis on the situation. The unvoiced questions included those related to her intimate life with Urho. With the help of the solutions, Anja realized that after the operation things would be normal after a few months of recuperation. As an unexpected bonus of using the decision support solution, she also realized that the operation would have a minimal impact on her hobbies and already in the next winter she would even be able to ski again.

Anja had discussed her upcoming operation with her friends as well. The feedback from her friends was mixed and instead she decided to use a moderated and anonymous discussion board that was implemented as an integral component to her health information repository. On the basis of this discussion (in a controlled environment), she decided to use the online health service evaluation system that would, on the basis of free and open governmental data, give her an analysis on the quality aspects (waiting times, patient experiences,
malpractice reports, etc.) of the possible service providers. As a consequence of this analysis, she decided to use her right as a resident of the EU to choose a health service provider from another country. Out of potential candidates, her final selection was done on the basis of a virtual tour to the service provider’s facilities. Using a simple and interactive tool in her health information repository that included calendar functions, she reserved a time for her operation (and transportation). With her consent, the repository translated her relevant medical records into the language of the service provider and sent them securely to the provider’s health record system. All financial transactions that did not need her attention and consent were executed automatically as a background process.

After her successful operation, Anja’s records were automatically translated for her and her local health service providers. In addition, all physiotherapy and patient instructions were stored in her repository. As a pioneer in the field, the used service provider also provided the physiotherapy with instructions via an augmented reality application that helped Anja to actually see from different angles what she should do in order to support her recuperation.

**Negative Scenario 2020**

Anja never acquiesced to the proposed operation and now it is too late. She is incapable to move because of her hip joint destruction. She is mainly bound to bed. Even sitting in the wheelchair is too painful although she gets painkillers in very big doses. She is depressed and has lost her zest for life. The only joy in her life is the visit of Urho.
References


SCENARIO #3: A WEB BASED ULCER RECORD FOR COLLABORATION BETWEEN PATIENTS, SPECIALISTS AND HOME CARE - NORWAY

Anne Granstrøm Ekeland, Norwegian Centre for Integrated Care and Telemedicine (NST)/University of Tromsø, Dept of Clinical Medicine, Ada Steen, University Hospital of Tromsø, Marianne Trondsen, NST

Actors
Patients and health care professionals.
Robert is a 35-year-old man who has suffered from ulcers for two periods. First, due to blisters that aggravated. Underlying diagnoses were hypothesized. The first period lasted for 4 years, and different care plans were followed. Unfortunately a new ulcer developed on the same spot 3 years after the first one had healed, due to an incident at work. He consulted his GP regularly, went to the University Hospital for control and wanted to take care of his ulcer by himself at home. A more common user scenario, however, might be home healthcare nurses who attend to older people’s ulcers in their homes. The web-based record will be the same in any case. The ulcer team at the University Hospital admits patients to the record following a specialist consultation. The specialist team also teaches nurses and patients to use the web-based record.

Setting
The University Hospital offers a web based ulcer record service (www.pleie.net). The system can be accessed from both a computer connected to the Internet and from mobile phones. It is available for nurses and doctors in the local community, nurses and doctors in specialist health services, as well as patients and their relatives. The system consists of databases to store data, an application to communicate images and text between participants and a tool to analyse ulcers. The service includes advice between a specialist team and home health care nurses, or patients who take care of their ulcers by themselves. Pleie.net has a common portal and login page with general information about the service. Participants from the various service locations might also select their own login page directly. All databases are run at the same server park, and there is a common user database and patient database with demographic information about the users and the patients that all the other databases and applications are linked to.

For the computer a two-factor authentication is required; implying username/password and a onetime password sent via SMS from the server to the phone number registered in the user profile. When the service is accessed from the mobile phone, both user name/password and a onetime link are used. This responds to security requirements.

Goal
(Background for the establishment of the record)
Ulcer patients have experienced that different health care professionals convey different opinions about treatment. They may also be exposed for different nurses who follow different plans, which make it difficult to assess effects of specified interventions. This communicates insecurity and causes pessimism.

E-mail based communication with attached images makes immediate intervention possible if the status of the ulcer changes. Rapid interventions should reduce the need for hospital admissions. Faster improvement of the condition is expected. Options to discuss the development by looking at the stored historical images and text make common care plans and better knowledge about every patient at the home care districts possible.

The system should simplify collection of data both at the University Hospital, at the GP’s office and the patient’s home. It is expected that patients should experience confidence and practical follow-up as well as a sense of more flexibility and autonomy. In addition, historical images are important for actually seeing improvement over time.

Scenario Today

“If anything new is discovered I can take a photo and send it immediately, usually I get a response the same day.”

After hospitalization at the Department of Dermatology, patients or their responsible community nurses are offered guidance in the further ulcer treatment from the expert ulcer team through the web-based record. The patients or the community nurses take digital photos of the ulcers and publish photos, comments or questions for responses from the ulcer team. There are no restrictions on the frequency or length of messages. A written answer with advices for the further treatment will be sent from the ulcer team as soon as possible, within 24 hours at latest.

The option to store the ulcer images helps compare images and observe how the ulcers change over time. It is easy to follow up interventions as specified in the record. The images make ulcer documentation less person-dependent, and can be used for work-based training. Users in home care report knowledge of alternative treatment plans and that they are encouraged to learn a more specified language. They experience more attention, and they are encouraged to build ulcer teams at the home care districts.

The system is considered very useful, especially from the mobile phone, as the camera can be used and connections made directly to the service. The ulcer record is currently not integrated in the electronic patient record.

It is a challenge to obtain strong use of the record in spite of positive users. Home care nurses seem reluctant to use it and report that they do not have time to change routines or that they are unfamiliar with operating data machines. Users have expressed another constraint: The professional language used by the experts. When sending images it is difficult to express in text what kind of situation it is, and ask questions. It can be perceived as a threshold for using the record. Images are not always enough, so a combination of physical controls and follow-up via data is ideal. Another challenge described is the fact that no fully acceptable technological solutions are available to comply with legal and security requirements for access via mobile phones. Secure solutions for mobile communication are lacking.

The increasing problem of ulcers for instance caused by diabetes, the increasing cost of out-patient calls caused by ulcers and the new policy goals to move services closer to the municipalities and homes, call for a stronger focus and coordination of services, a better institutionalization and more use of this kind of tool.

Positive Scenario 2020

In 2020 the ulcer record is integrated with a net-based patient record. Within this record, a number of services are developed, both for internal use at the hospitals and for communication between different units in health care. The current challenge between standardization of data and specificity and flexibility of data for communication within singular services is solved. New tools allow for secure and practical daily communication between home care nurses, GP’s, patients and specialists.

In the home care district offices and in hospital departments, stored text and images are available on large screens as well as mobile units. It allows for inspection of developments over time, discussions of effects of different registered interventions. This helps improve knowledge, skills and interventions.
For professionals and patients, mobile pads are equipped with cameras of excellent quality and images are easily stored and transferred. In the homes, large screens are installed containing internet, telephone, radio, TV, smart home technology, the ulcer record, self-help programs within a general health care package, as well as web functions. These programs are also available on mobile units. The big screen is operated as preferred by patients or professionals: touch screen, physical movements, voice or remote control.

**Negative Scenario 2020**

There are problems with establishing a uniform database structure for patient data. This causes indistinct procedures for instance on authentication and levels of access: Who has access to what kinds of data? The challenge of establishing unique addresses for different units and actors in health services, who are expected to communicate, is causing delays and confusion when data intended for one unit arrives at a different one.
SCENARIO #4: USING REMOTE CONTROL FOR WATCHING TELEVISION - NORWAY

Rita Jentoft, University of Tromsø

**Actor**

Karin, aged 58, is recently diagnosed with Alzheimer's after visiting the Memory Clinic regularly the last three years. Gradually, her memory, word finding, environmental attention and ability to organize and plan activities, has decreased.

Karin lives in a flat in the city together with her 20-year-old daughter, Julie, who is a student. Julie has become the important supporting person for her mother, and taking care of shopping, administration of papers and finances as well as deciding when it is time for cleaning the house. Since Karin quit working two years ago, her financial situation is worsened. Julie has to take part-time work in a grocery store, beside her studies, to support their economy.

**Setting**

Karin is alone at home every day, and feels sometimes lonely and occasionally anxious. She uses the TV as company during the day. However, she has trouble both switching on the TV, as well as shifting channels. To watch her digital television (TV), Karin has to manage two remote controls (RC) and use them in correct order. One RC turns on TV, while the second operates the digital tuner, selects channels and adjust the sound. Karin find it problematic choosing between the many, tiny buttons to find the preferred program. When problem occurs, she usually pushes several buttons by chance, which leads to erase the pre-set channels. On a daily basis Julie has to help her and reinstall the TV setup. When Karin call Julie for help, she finds it difficult to explain to her mother on the telephone, how to use the two RCs. She also dislikes being waked up on Sunday mornings when Karin does not manage to turn on to her favourite program. They both express frustration for this problem.

**Positive Scenario Today**

The occupational therapy project worker suggest, after doing a user needs analysis, that Karin may try a simple remote TV-control. The project worker provides a simplified remote control (SRC) through the project. The device is originally developed for people with visual and coordination difficulties, in addition to learning disability. The SRC is synchronized with the two old RCs in order to replace the two controls. Karin chose the four most preferred channels, and these are visualized with logos on the big buttons on the SRC. Julie is happy that the project worker did the installation. “I don’t have energy reading manuals these days”, she said.

The project worker demonstrate how the SRC is working, and give Karin instructions on how to use the SRC. Karin tries to operate it several times and soon she manages this quite well.

Three months later, on a follow-up visit, Julie tells that all three RCs initially were available the first week since Julie prefers using the ordinary RCs. Consequently, Karin frequently grabbed the “old thing”, the RC she was familiar with, which led to erasing TV-channels again. Julie learned that she had to hide the original RCs. It took some time before Karin became familiar with the SRC. According to her daughter Julie, Karin sometimes chose the wrong button or did not find the “off-button”.

After a week holidays away from home, Karin forgets about the SRC and searched for the old RC’s. However, after instructions from Julie and practicing for a short time, she manages operating it. Karin did not experience any problems using the SRC. “I love it, it is so easy, everybody can use this”, she says. Julie admits that she uses the SRC herself, and finds it both fast and easy to use. Most important, Karin stops calling Julie during daytime and waking her up in the morning.
Implementing a simple remote control is, even though the device is simple to operate, a challenge. Karin’s motivation and openness towards having a new product in her home, is crucial for acceptance, customisation and seeing the device as part of her everyday technologies. For Karin, watching TV is a part of her daily-preferred activities, and the TV means company and entertainment for her, and also keeps the anxiety under control. However, dementia often progress, and follow-up is vital for checking whether the device is used or not, if the batteries need to be changed, or maybe the person has to relearn how to use the device. For Julie, the SRC is of help - she is happy that her mother could watch TV and has a chance to select one of four preferred channels by her own. This means that Julie did not have to feel bad about not being at home or sleeping in the morning.

Negative Scenario Today
Julie has read on the Internet about several simple remote controls to ease the use. This to solve her problems with operating the TV using two RCs as described. It is difficult to understand which one will be the best for her mother, however she orders on from the Internet shop. The product is originally developed for people with sight, coordination and learning difficulties. The instructions do not tell how to combine two RC, because it is made for analogue TV signals. Julie tries to get support from the Internet shop, describing the problem by mail. After 3 weeks and 3 more mails she gets a respond, a telephone number to the SRC product developer, who she calls. They are helpful and give instructions on the phone how to install the RCS. Julie has good technical insight, managing this quite well. Unfortunately the SRC does not respond with TV and tuner. She calls the product developer again. Unfortunately this SRC does not communicate with satellite TV. Julie gets angry and throws away the SRC, regretting this time steeling project leading to nothing more than frustrations, which she has a lot of already.

Positive Scenario 2020
In 2020 broadcasting has become internet-based and the menu is flexible and easy to use. The functions are easily chosen and adaptation is possible to master for the individual. Karin and Julie have a large stationary screen at home containing Internet, telephone, radio, TV and smart house technology, all web functions. At the coffee table lie two small portals offering same functionality as the large screen and additionally including the RC functionality. Unfortunately Karin has become unable to handle the touchscreen on the RC. She pushes hard on the screen instead of touching and dragging softly. The OT recommends Karin to explore another way of communicating with the big screen. There are two ways that could be adopted to better fit Karin’s function, hand movement or recognizing by voice.

Karin and Julie first chose to explore the use of voice recognition TV broadcasting. Karin tells that she also find it hard finding and choosing between all the pictures and options on the screen. It is also hard for Karin to follow a procedure and she makes mistakes and gets frustrated.

Then, the OT and Julie support Karin to choose the 4 major pictures Karin wants to operate on the screen. She chooses Telephone with picture of the 4 most important people, Games, Music and Film/Broadcasting. In the voice recorder, Karin gives oral instructions to turn the screen on and off, choose broadcasting / TV, she tells her favourite channels, sound up and down. The same installations are done for telephone; call her daughter Julie, mama Ester, brother Kim, and friend Sylvie. For music and games she wants to explore hand movement. But first she needs to practice the voice control.

This voice control could only be adopted for one user only. Julie can still use the ordinary RC, but is recommended hiding it in her bedroom. This is to support Karin practicing the new procedures, but also because Karin might automatically choose the ordinary RC, which is more familiar to her. Karin manages the voice control easily and is very pleased to manage these for her meaningful activities since she spends many hours on her own at home.

The OT will follow up with Karin and Julie on a regular basis knowing that the disease progress and they need support to reduce stress and for Karin continue to participate in meaningful occupations. Finally Karin and Julie get contact information to the ICT engineer who is a part of the support health team to get support if the technology doesn’t work.
Negative scenario 2020
At the last consultation on the memory clinic, Karin and Julie got a brochure named: “Welfare technology to support memory loss”. In the brochure there were pictures of several Assistive Technologies. The text claims that people with younger onset dementia could benefit from specific ATs. Several producers selling the ATs were listed with webpages and telephone number. Julie looked into the webpages wondering what she needed and the costs. But Julie and Karin did not know what to buy, nor could they afford it. She called them for seeking information. They told her that they could send her research reports to support her finding out their needs. But Julie, who already felt tired supporting her mother and finding out where to seek proper help, cried and demanded professional supervision. The firms could give access to professional help from the OTs working in the firm, however the costs were too high and the insurance did not cover implementation of ATs. The firm recommended Julie to contact the Assistive Technology Center to get more information about assistive technology. They sent her a website address.

Julie opened the very instructive National Assistive Technology Center website and found information of available ATs for people suffering from dementia. These were organized in a package with 4 ATs; a stove timer, a digital calendar, an item locator watch and a simplified remote control. These were recommended as best practice to support YOD in their everyday occupations, the most needed ATs based on RC studies. The cost for this package was USD 1000,-. If financial problems, you could apply for a 50% reduction. The package could be sent within a few days. They agreed that it was necessary to order an OT for home visit, which called 10 days later to assess the situation. Unfortunately they had to wait for 6 months for a home visit, which became meaningless since the disease progressed. They needed professional help now!
SCENARIO #5: MOTION INTERACTIVE GAMES IN HOME REHABILITATION FOR CHILDREN - SWEDEN

Actor
Jessica Anderson, 12 years, diagnosed with unilateral cerebral palsy of a moderate form.

Setting
Home of the Anderson family.

Scenario Today
(Both negative and positive)
Jessica comes home from school at three thirty in the afternoon; she throws her school bag on the floor in the hallway and hangs up her jacket. It is quiet in the house, none of the other family members are home yet. She walks to her room and sits down in front of her desk and turn on the computer. The next hour she spends surfing around on Facebook and chatting with some friends whom she met last summer at a camp for children with disabilities. For a while she Skypes with John, a guy from the camp, and they try to play an online game together. John, who also has cerebral palsy, sits in a wheelchair and is considerably more disabled than Jessica. He cannot quite keep up with the same speed as Jessica, so playing together is a bit frustrating.

-Jessica, the food is ready, Mom shouts from below the kitchen. Jessica says goodbye to John and logs out from Skype. She stretches her arms above her head, stiff after a full hour of sitting still in front of the screen.

-Shouldn’t you take a session with the games at least once this week? Mom says when Jessica is putting away her plate after dinner.

-OK, Jessica sighs, and reluctantly goes to the living room. She switches on the TV and the Xbox and opens the drawer with the games. She has several motion interactive games to choose from, but starts to be pretty tiered of most of them. She flips the games around for a while, chooses a sport game and inserts it into the gaming console. After a while, searching for the game controller she finds it under the couch, and can finally begin to start the game. With a series of keystrokes, choices and preferences, she starts the game. She chooses tennis and plays against an animated figure. Although it took a while to get going, it’s pretty fun once she started. After a few minutes she has to take off a sweater as she starts to get quite sweaty.

-Can I join? Jessica’s little brother is standing at the door.
-OK just give me a minute to finish this round.

It’s always fun to play with somebody else because it adds an incentive competitive element. Unfortunately, Jessica rarely has a chance to win over her little brother because of her disabilities, which is a bit dull. But she has learned a lot of tricks to cheat and fool the motion tracking system of the game. However, these tricks means that she does probably not perform all the movements she need to practice and the training effect may be reduced, but it will at least be fun. They play together for half an hour before it’s time to shut down and deal with today’s homework instead.

Positive Scenario 2020
Jessica comes home from school at three thirty in the afternoon. She throws her school bag on the floor in the hallway and hangs up her jacket. None of the other family members are home yet.
Perfect, Jessica thinks, now I can take the opportunity to play without my little brother bothering me.

She walks into the living room and stops in front of the multimedia wall. Through short voice commands she starts the television and gaming console and logs into the youth rehab portal. At the left side of the screen she can see which of her friends that are already logged in. John a guy she met at a camp for children with disabilities is present; they often play together in the afternoons. By pressing her hand over John's picture, she calls him up.

-Hey Jessica, are you eager for revenge? John laughs when he answers.
-Yeah, and I intend to win this time, Jessica replies. They start their cameras and now John appears on the TV screen in front of Jessica, where she can also see an image of herself.

-OK, let's play tennis then! John "walks to" the comprehensive list of activities available. The list includes various kinds of physically challenging games but also games with a focus on problem-solving and cognitive abilities. As he browses to and selects tennis both their profiles are automatically activated. These profiles do also include a "handicap" based on their level of abilities. John, who also has cerebral palsy, sits in a wheelchair and has problems to coordinate his movements. But thanks to the handicap system, they can still meet each other as equals even though John is considerably more disabled than Jessica is.

It is a hard and even game, which takes about 15 minutes before Jessica manages to win the last set. When they return, sweaty and giggly, to the youth rehab portal they see that Hanna, their physiotherapist from the summer camp, has logged in and calls her up.

-Hey how's it going? Hannah asks while she appears on the TV screen.
-You look sweaty! Did you have a tough game?
-Yes, we are absolutely exhausted.
-Nice, I can see that you two have been pretty busy with the training lately, you have burned many calories and also improved your handicap scores. Hanna comments, she did check out the youngsters training profiles while they played.

-What do you say, are you in the mood for a little Tai Chi to round up? She suggests.
-OK.

When Tai Chi is selected another person pops up on the screen, this time it's Peter, an avatar who will lead the session. To the tunes of soft music Peter instructs a series of movements for the participants who are also receiving individual feedback on their performance through the motion tracking system of the gaming console.

-Bend your knees more Jessica!
or
-Straighten your back John.
-My gosh, this guy doesn't miss anything! -It is certainly not possible to cheat, Hanna giggles.

After finishing the Tai Chi session a few other friends have logged into the platform and Jessica hangs out for a while before it's time to sign out and deal with today's homework.

**Negative Scenario 2020**

Jessica comes home from school at three thirty in the afternoon. She throws her school bag on the floor in the hallway and hangs up her jacket. None of the other family members are home yet.

-Perfect, Jessica thinks, now I can take the opportunity to play without my little brother bothering me.

She walks into the living room and stops in front of the multimedia wall. Through short voice commands she tries to start the television and gaming console but, as usually, the voice command system does not work and she needs to use the manual controller instead. She logs into the youth rehab portal. At the left side of the screen she
can see which of her friends that are already logged in. Unfortunately today, as most days, no one else has logged in.

She continues to play a couple of games on her own, competing with a computer-generated avatar. It is a hard and even game, which takes about 15 minutes before Jessica manages to win the last set. When she returns to the youth rehab portal she can see that Hanna, her physiotherapist from the summer camp, has logged in, and calls her up.

- Hey how’s it going? Hannah asks while she appears on the TV screen. - You look sweaty! Did you have a tuff game?
- Yes, but it is not as fun when I have to play alone. Do you have time for a short game with me?
- I’m sorry, Hanna replies, another patient is waiting here at the clinic. But I can see that you have been pretty busy with the training lately. So keep up the good work.

- Alone again, Jessica moans. I guess I can try a little Tai Chi to round up? She thinks.

When Tai Chi is selected another person pops up on the screen, this time it’s Peter, an avatar who will lead the session. To the tunes of soft music Peter instruct a series of movements for Jessica who is also receiving individual feedback on her performance through the motion tracking system of the gaming console. Unfortunately, the motion tracking system does not work properly and the feedback she gets is quite difficult to understand.

- Bend your knees more Jessica!

- My gosh, I can’t bend them anymore! It is a bit frustrating not being able to follow the instructions, or get the system to adapt to her abilities. Hanna turns of the game without finishing. Back to the portal she can see that she is still the only one logged in. It would be more fun if we were more users, she thinks while she logs out and starts to deal with today’s homework.
References


SCENARIO #6: INTERNET-BASED ACTIVITIES, SOCIAL MEDIA AND OLDER PEOPLE - SWEDEN

The area of Internet-based activities and social media is of importance as it can enhance older peoples possibilities to continue have an active role in society and keep a social network even if geographic distances increases and/or mobility problems occur.

Actor
This scenario starts in a rural village in northern part of Sweden. We meet Lilly, a 76-year-old single-living woman. Lilly has been living alone in her house for more than 15 years now, the place where she grew up but left to work in a bigger city during many years and came back when retired. Lilly has no children but still a large family; she has two siblings and lots of nephews and nieces as well as neighbours and friends who care about her. Lilly has in the last years experienced health decline with back pain, heart failure and fatigue, though she still manage to take care of herself and her house, she has big problems with mobility outdoors and travelling. She has no driving licence but until recently she has caught the bus when going shopping, to the library or meeting places. But this is not possible any more. Mostly her family or friends help her with grocery shopping but being mostly indoors makes Lilly in risk for social isolation and occupational alienation. It is hard to keep up her contacts and continue with what she think is a meaningful in life; for example genealogy, gossip with friends about the royal family, take care of her garden and discuss politics.

Lilly has her own computer since three years, she use the computer to write letters (as she think her handwriting is impossible to read), send e-mails, pay bills and read newspapers, she also uses a genealogy-program. She used the genealogy program more or less on a daily basis when she could go to the library where a lot of information was available.

Goal
Lilly would like to be more social active and also have possibilities although mobility problems to participate and be active in society.

Scenario Today
Lilly wakes up, make herself breakfast and eat by herself. She would like to have company today so she call her sister on the phone to find out if she can come visit her but no answer. Lilly starts to make a cake in case someone pops in, she hopes so. Unfortunately, Lilly finds that the fridge is more or less empty and with no milk at home she can not make any cake or bun – Lilly gets sad and down. She needs to be more well planned she chide herself. Lilly starts up her computer instead, it takes a while before it is starts and Lilly could almost have a cup of coffee in the meantime. Lilly is dreaming of a laptop but do not have the economical prerequisites right now. Lilly want to read the newspapers but the connection to be on-line is very slow today and loading the home page of a newspaper takes forever, Lilly gets restless. After long waiting time she can read one of the big national daily newspapers, but she dare not to read any other paper even though she would like to, the connection to the net is too slow today. She sends an e-mail to one of her nieces instead, asking if she will come and visit during Eastern holiday. If she is lucky she will get an answer later today! Lilly pick up the phone and call one of her friends in the
genealogy-group, which they both are members of, but no answer. She realize that the group has their weekly meeting right now, without her at the library. It is a lovely weather today but Lilly feels down and would really like to have something fun to occupy herself with. She starts to read some old gardening magazines but stops when she finds out she already know all of it, she would like to have something that challenged her in the area of gardening, now when she no longer can dig in the yard or work with the plants. She has so much experience but do not know where to use it anymore. The newspaper arrives with the post about 1 pm and she read about the large party leader debate and the topics that probably would get most attention in the debate today. Lilly have a lot of opinions about these topics but no one to discuss with right now, she has to be patient and wait until someone comes visit.

**Scenario 2020**

Lilly wakes up, take a shower and start preparing breakfast. She knocks on the screen besides the table to see who is online and want to have e-breakfast with her. Her neighbour Anna and her sister Rut is there, they already started to eat and Lilly join them. In the table Lilly have as always the daily e-newspaper, she skim through the news and the discussion with Anna and Rut is both gossip and about news. All together this start of the day updates Lilly and make her feel good, a great start of a great day!

Lilly love when someone comes to visit her, she usually treats visitors with a cake or a bun and therefore she needs to bake today. Lilly open her fridge and finds it almost empty, she can through the touch screen in the kitchen table go into her on-line store where she can virtually walk through the real nearby grocery store and pick those articles she needs from the shelves. After paying, an estimated time for when the articles will arrive is shown; they will come later today with the bus. She connects herself to the cloud where the family has their shared collection of family recipes, both culturally important "old" recipe and those new that they tried during family dinners. Lilly pick one of the traditional cakes that now has 12 comments made by members of the family, all comments are very positive, the cake is called "the best in the world". She plan to make the cake in the afternoon as she realize that the genealogy-group starts in a few minutes.

She chooses to move from the kitchen table to the couch where she can rest her back better so that she can manage a longer discussion with the genealogy friends by using her multimedia-screen on the wall in the living room. Most members of the group meet at the library but Lilly, and sometimes also others, join the group through Skype. She listen to the short introducing lecture and take part in the following discussion about opportunities and hindrances with the new genealogy programme that is possible to download.

After the genealogy group is ended Lilly take a lunch sandwich and have a chat with a few from the genealogy group that stayed in the group room at the library. After half an hour Lilly realize she needs to update and take care of her own blog about gardening, therefor she end the lunch-chat and start to work on a new update for her blog. Yesterday’s update resulted in a few comments from people that wanted to know more about how to take care of their geranium now when the spring was approaching. Lilly worked on her blog for an hour. Boosted by all positive feedback from the blog she collected her articles that had arrived from the store and made the cake. Tried the fresh cake with a cup of coffee while listening to the party leader debate and twittering about ideas and opinions that came to her mind during the time.

**Possibilities 2020 or Evaluation of goals**

Lilly can continue to be an active social participant in the society and find her everyday life meaningful.
References


Larsson, E., Larsson Lund, M., Nilsson, I. (2012), Internet Based Activities (IBAs): Seniors’ experiences of the conditions required for the performance and the influence of these conditions on their own participation in society. Accepted for Educational Gerontology.


SCENARIO #7: TELEHEALTHCARE 2020 - DENMARK

It is the year 2020, and healthcare has changed considerably because of new technologies.

Setting
The case setting: homes of COPD patients.
It is well known that COPD patients with cognitive dysfunction are a significant clinical problem since patients have increased need for help to the most basics activities in the daily life. It is also known that they have lower compliance in the medical treatment because they often forget to take their medication or administer it in the wrong way [www.virtuellehospital.dk]. COPD patients are admitted virtually in their own home because numerous studies have shown that their cognitive functions improve considerably in case of virtual admission compared to ordinary hospitalization.

Actors and Stakeholders
Patients with COPD
Relatives to patients with COPD
Nurses at the health care center
General practitioners
Doctors from the hospital
Administrative staff from the municipality

Goals
The new technologies for COPD patients are focused on the individual’s wellbeing in healthy surroundings. Innovative technologies analyse the body’s level of health to secure that the disease or the aggravations of the disease are detected at an early stage. This early detection is detected due to implants that monitor the development. By using intelligent medication and using avatar technology it is possible to keep focus on the patients’ health. The goal for the COPD patients is to be more responsible for their own treatment on a daily basis - supported by new intelligent healthcare applications.

Action
[Missing]

Positive Scenario 2020
Tom was diagnosed with COPD 4 years ago. He has been admitted to the TeleHealthCare system for the last 1½ years. The TeleHealthCare system is an interactive platform, which collects all relevant data concerning Tom, and it is also the platform, which is used for virtual contact with the Health Professionals. One of the important features in the system is a technology called RFID – Radio Frequency Identification [http://ipaper.ipapercms.dk/IDA/Politik/sundhed2020/]. RFID makes it possible to take care of the quality of the services delivered to Tom because it identifies all measurements, interventions and treatments automatically by a little chip in Tom’s leg, which can be read by the RFID-reader. RFID tags structure the data and link them together by keeping track of the medication, the patient, the equipment, and the staff, which can all help increase the patient’s safety.
Overall, Tom’s Life has become easier because of the technology provided by the TeleHealthCare system because it allows him to focus on the things that he finds important - being with his wife, his family and close friends, and focus on rest and activity.

Every day Tom goes for a walk with his wife if the weather is good or else he plays golf on his Wii. The Wii gives Tom the possibility to train and exercise whenever he has the energy for it and not whenever the physiotherapist
has the time to come by. All data from Tom’s interactive Wii training are transmitted directly to the doctor together with other daily tests. That way the doctor can assess data to see his condition and change the treatment if needed. That part of the data with information about the actual execution of the activity is also transmitted to the physiotherapist who through the videoconference module can be in touch a couple of times during the week to guide and motivate Tom in his exercise.

A couple of months ago Tom was tired of playing golf and at the same time the weather was cold and damp outside which did not encourage him for a daily walk with his wife. The physiotherapist tried virtually to encourage Tom to play other Wii games so that he could get his daily exercise but Tom was not interested in other games. The RFID collected all data about Tom’s inactivity and sent a message to his doctor to pay attention to changes.

The doctor invited the couple to a videoconference where he showed an avatar of Tom. The avatar was an identical copy of Tom, which showed the negative progression in his situation from being active walking around and part of social life to being bed lying 24-7 depending on the help of others, if he failed to do his daily workout. This simulation gave the couple a lot to think about and shortly after Tom began his training again accompanied of his wife who wanted to support Tom in any way she could.

During the period Tom has had the TeleHealthCare system he has only been really sick once. That was when he got a cold, which developed to pneumonia. The RFID received data from pressure sensors in the walls and floors and from a chip in Tom about his changed movements. The RFID compared these changed movements with all the other data and informed his doctor. The doctor assessed the situation as acute and saw why a quick response was necessary. Tom needed some blood tests, which the robot assistant in the TeleHealthCare system managed. The robot assistant takes blood tests using camera sensors that can reveal even the smallest veins and in addition it can also analyse the blood tests. When all the data was registered in the RFID the doctor could access all the current information about Tom. The doctor contacted Tom and his wife virtually and started the medical treatment. Due to the rapid response Tom avoided acceleration in his condition.

When Tom is very ill he gets cognitively affected and is having trouble remembering when to take his medication. In the past he always got it too late - when he actually was respiratory depressed. Now Tom gets intelligent medication to avoid that - that means that he only has to take a pill once a month and it delivers target doses to the parts of Tom’s body that needs it. This happens by the help of the drug delivery technology [http://inano.au.dk/da/outreach/nanovidenesbank/nanomedicine/fremtidens-kraeftmedicin/], which uses molecular transporters and Nano particles, which deliver direct to a specific part of his organs. Tom’s experience with the intelligent medication is that he is feeling better. Before he had important side effects (such as shaky/shivering hands) due to his acute medications, but that is now history because the intelligent medication target doses on a daily basis and thereby decrease his need of acute medication. The RFID automatically reads the medication dose and activation in Tom’s body why the information becomes available for the health professionals.

Before Tom was assigned the TeleHealthCare platform he was always admitted to the hospital whenever his condition worsened. In those situations his respiration rapidly deteriorated because of all the fuzz around him, for example being picked up by the ambulance, the ride to the hospital, moving from stretcher to bed, temperature fluctuations and responding to all the health professionals’ questions etc.

In general, he now experiences with the TeleHealthCare system a much more satisfactory condition and personal wellbeing. The technology opens up for distance diagnosis by using the technology - video, pictures, sounds, and measurements and involves the health professionals in the diagnostics and treatments in an early state in his home. At the same time he gets the right amount of medication his body needs at the right time. That way Tom does not need to get admitted to the hospital whenever his situation worsens. It means a lot for Tom that he can stay in his home environment nearby his loving wife. That means everything for Tom, he feels very safe.

**Negative Scenario 2020**

For 2 months Tom has been admitted to the TeleHealthCare system and he is not quite happy about it. First of all it does not make him feel safe and he does not like the feeling about being monitored all the time. All the sensors in the house and the little chip in his leg register everything down to his smallest movement. That is difficult to ignore even though he knows it is there to help him. Second of all, he recently discovered that the system worked inappropriately. After a lovely weekend together with his family filled with cosiness and togetherness and different physical activities he decided to lie in bed a little longer than usual because he needed the sleep and recover.
During his sleep he was contacted first by the physiotherapists and after that the doctor. They contacted Tom because the RFID system automatically informed them about him being in bed longer than usual. They both started a big lecture about how important physical activities is for Tom and the doctor even showed a simulation of the evolution of his situation using avatars if he did not get out of bed. Tom felt this was entirely above the target and had no connection to the reality, which he tried to tell them. After this experience Tom gets the feeling that the system is there for the sake of the system and not for his sake. His experience is that the physical and personal contact to the health providers is replaced by technological solutions not adapted to his needs. That makes him feel lonely and isolated with his illness compared to earlier, where the doctor, nurse and physiotherapist came round to visit him on a weekly basis. In the old days Tom had the feeling that they really understood who Tom was and how he lived, and they even showed real interest in Tom as a person by asking him different questions about his life. Now they only contact him when measurements are disturbing.
References


Human Virtual Interaction Lab, Stanford University. Website address: VHIL: Virtual Human Interaction Lab - Stanford University [Lokaliseret 15.10.12]


Virtuelle Hospital. Telemedicinsk Forskningsenhed, Frederiksberg Hospital, Region Hovedstaden. Website adress: http://www.virtuellehospital.dk/ [Lokaliseret 15.10.12]
SCENARIO #8: ROBOT VACUUM CLEANING  
- DENMARK

Actors
The actors in the scenario are the residents in the nursing center and the staff who takes care of the residents. The primary focus will be on the staffs that are responsible for both cleaning and personal care. In this setting all staff was promised that no one would be resigned, even that the automatic vacuum cleaning would spare time for the staff. This promise can be important for a successfully implementation strategy.

Setting
The settings are nursing centers in four municipalities in Denmark. The main focus for the use of robot vacuum cleaning is the common areas in the nursing centers and the second focus is in the private apartments that are associated with the nursing centers. The Vacuum cleaning in the common areas was carried out mostly while the residents were away from those places. The vacuum cleaning in the private apartments was carried out in two ways. One in connection with other tasks that the staff had to perform for the residents and one where the robot vacuum cleaning was started either by automatic or by the residents when they left the apartment for a while. The most appropriate use of the robot vacuum cleaner was when it was started and then the vacuuming was performed without further monitoring by the staff.

Goals
The goal of the residents is primary that their apartment is vacuumed, and that the level of cleaning is in an acceptable standard. The goal of the staff is a better working environment and to use less resources on vacuuming and more on other tasks together with the residents.

Actions
In the evening after the residents have been eating their dinner in the common area, they are followed back to their private apartments and the common areas are left without activities during the night. Staff who work in the evening shift start the robot vacuum cleaner and the robots will vacuum the common areas during the evening by itself. The time the staff used on the vacuuming before is used to talk with the residents and help them with different personal care, which they feel add value to their daily life. This is the positive part of the scenarios below. But the staff has to empty the dust box in the robot vacuum cleaner after each vacuuming, as the box is rather small and will drip dust on the floor if it is too full of dust (Rasmussen et al 2009). This is done every time before the vacuuming is started and the staff must wear a dust mask and gloves to prevent allergies (Servicestyrelsen 2011). This is the negative part of the scenarios below.

Positive Scenario Today
It is evening at the nursing center. Staff will be focused on helping the residents to their private apartments and to settle for the night – help residents with personal care. Yvonne, a nurse, helps John, a resident to his apartment. The apartment is clean because the nursing center has invested in robot vacuum cleaners. John can feel the difference and especially that the staff has more time to talk. Although they were in the apartment when vacuum cleaning it was impossible to have a conversation because of the noise. Now it is nice and clean, no noise and time for talking. Yvonne and John talks about the activities of the day, the weather and the plans for tomorrow. Yvonne has seen the weather forecast, which promises sun tomorrow and they will see if they can plan time in the
garden. After helping John Yvonne goes to Sussi’s apartment and then to Hans’ apartment. In the common areas the cleaning personnel have put the food away and the robot vacuum cleaners are started before the night. While the residents are sleeping the vacuum cleaners start working.

**Negative Scenario Today**

Yvonne, a nurse, helps John, a resident to his apartment. The apartment should be clean because the nursing center has invested in robot vacuum cleaners for each apartment and for the common areas. But when Yvonne and John come into the apartment they can smell a kind of smoke. John gets nervous he is afraid of fire as he is not able to walk without help. Yvonne calms him down and lets him sit on a chair outside the apartment. Yvonne looks inside the apartment and finds the robot vacuum cleaner stuck on the deep-pile carpet. The person who started the robot vacuum cleaner forgot to empty the debris bin and clean the filter and brushes, and when the robot hit the deep-pile carpet it got stuck and moved continuously in the same place and the motor gave up and overheated. Yvonne tells John what happened and he is now convinced that it is safe to go to bed. Yvonne opens the window to ventilate the room while she removes the robot vacuum cleaner and promises John that she will vacuum his carpet tomorrow. John is rather upset and can’t sleep - he calls Yvonne and asks her to bring him a sleeping pill. He tells her that he will never again want a robot vacuum cleaner in his apartment.