ICT & Ageing Scenarios

Independent Living

Health and Care in Life

Occupation in Life

Recreation in Life
BRAID aims at developing a holistic roadmap that covers all areas of a person’s life.

The roadmap is focused on four different perspectives, the “Life Settings”:

- Independent Living,
- Health and Care in Life,
- Occupation in Life,
- Recreation in Life.

These settings correspond to the main areas of life of a person in general, and will need to be supported as we are ageing. The settings stand for priorities in life, and are not location-based or mutually exclusive. In principle, not all elderly citizens may need equal support in all of the above areas. However, the significance of defining these four settings is that they comprehensively cover the main aspects related to active ageing and well being of the elderly.

This booklet presents a collection of illustrative scenarios for the different life settings.
ow technology can assist in normal daily life activities e.g. tasks at home, mobility, safety, agenda (memory help), etc. Main developments under this perspective are focused on assistance at home, namely for elderly living alone, which goes hand-in-hand with developments on smart homes.

It includes services such as living status monitoring, with connection to care providers in case of any emergency, agenda manager to compensate for memory losses, companion and service robots, integration of intelligent home appliances, etc. Support outside home, namely in terms of mobility assistance, shopping assistance, and other daily life activities, is also considered.
Aldredo, 80, lives in the city's outskirts and is retired. In spite of his physical limitations, he lives alone because his home is prepared to provide daily life assistance to an elder person. A system installed in his house provides an environment with a range of interconnected sensors, devices and smart-appliances working together to provide a safe and secure place to live.

These appliances allow Alfredo an easy utilization due to their customized interfaces and are connected to Alfredo’s neighborhood care centre. This allows, when necessary, remote operation by authorized personnel. As part of the system infrastructure, the smart phones of Pedro and Joana, his children, also interact with his home.

Several video cameras distributed along the house allow observing Alfredo’s daily routines (by authorized people) and, at the same time, maintain his privacy. The system, is capable of interpreting the situation from the captured images, and can react in order to provide assistance to Alfredo in case of need. This assistance ranges from the simplest activities, like making tea to more complex activities involving the interaction with the care center. During the afternoon Alfredo lit the stove to make tea, but forgot to put the pot with water on the flame. The system alerted him of that situation.

While drinking his tea, Alfredo receives a video conference call. The video-conference facilities works in a way that provides "virtual" presence of other people, like Alfredo’s children and friends. Alfredo interacts with them through a giant and thin television held on the wall. When wearing the 3D glasses, he can even see and talk to his children, as if he could almost touch them, helping to reduce his feeling of loneliness.

The installed system is also able to react to the most common domestic accidents that are recurrent to people living alone. If it sees Alfredo suffering a potential injury, like falling on the floor or cutting himself, the system inquires him to make sure he is well. This interaction is done via spoken natural language. If there is no reply, an alert is immediately sent to his children and the care centre.

When Alfredo goes to the five o’clock walk, a floor-cleaning robot starts its work. Meanwhile, Joana remotely sets the smart-cooking device to start preparing Alfredo’s dinner. At seven o’clock, while taking his dish out of the smart-cooking, the door bell rings. Immediately the camera starts collecting images from the person outside. An event is sent to the care centre and their children, proposing video stream interaction with the person. The devices positioned at the door and windows provide the required safety against intrusion by burglar. There is nothing to worry about, as it is Alfredo’s girlfriend. The door automatically swings open, as the house already knows she has permission to get in.
John is a 78 years old person living alone in his house in the town’s outskirts. Although he is a relatively healthy person he has a problem related to short-term memory loss which is affecting his daily-life. Therefore, he needs some assistance to help him carry on his daily activities. Due to the demographic trends of last decades, there are not enough youngsters to assist the huge amount of elderly people.

Fortunately, technology has evolved in the recent years. Personal computers and the so-called smart mobile devices have evolved and can now do fancy and interesting things. John’s pervasive computing infrastructure is everywhere in the house and his smart-device goes everywhere with him, operating as a Personal Social Assistant (PSA). John’s PSA is capable of sophisticated reasoning, able to plan, run and coordinate complex activities and tasks. In addition, it is able of advanced human interaction, and can even resemble “human” emotions in order to enhance interaction.

Due to his short-term memory problems, John relies more and more on his PSA to support carrying out his daily activities, and maintaining his autonomy. As they are together for a long time, the PSA knows every aspect of John’s daily life, including his habits and preferences. Some of the PSA’s responsibilities are agenda (reminding) management, utility bills management, dietary organization, and leisure organization. The PSA also comprises several sensors for obtaining some physiologic values, which helps perceiving John’s welfare. It also anticipates eventual health problems, like feeling stressed or suffering from depression. The PSA takes care of John’s daily shopping. After checking the contents of John’s fridge and storage room, the PSA sends out an order to fill up John’s basic stock of supplies and, if John is in the mood for cooking, the ingredients of the recipes he has selected. The products will be delivered by a shopping service. Sometimes, John enjoys going to shop for food and other things himself, in order to meet and have a chat with local shop owners and other people on the market he knows. The PSA takes care for him here also and sends a special (radio) signal whenever John enters a store, so sales people know immediately that this customer needs special assistance. Another feature of the PSA is the management of John’s personal hygiene assistance. John is able to take care of very basic things, but when it comes to shaving or taking a bath, he needs help. John’s carer stops by his house in regular intervals. The PSA reminds John when it is time for a shave or a bath again, so he knows that the carer is about to come by. When John’s schedule changes, e.g. when his family comes for a surprise visit, the PSA notifies the carer that there is no need to visit John. The PSA is also able to intelligently search for information and news-media on the topics of John’s interest. “Listen John. I’ve just heard “Prokofiev’s violin concert number one” is being played in the theatre next month. Would you want me to make a reservation?” asked the PSA. “Yes, please”. The fact that John interacts with the PSA in such a natural way is beneficial to minimize John’s loneliness. “Don’t forget to take the blue pill from the second drawer John”. Sandra, John’s long date friend has just called. “Would you like to receive Sandra’s call, John?” “Yes, please”. At that moment it turned into a stand-alone state, letting Sandra talk through its interfaces. “Hi John. How are you?.
Angela is 72 and very active. She has many friends and likes to go out regularly. As she lives in the city centre, she finds it convenient to walk, as she always has. She is, however, suffering from angina and asthma which makes walking, although beneficial for both conditions, more of a challenge. This makes her planned trip to meet her friend Rosemary at the Science Museum more of a challenge than it was five years ago.

But in those five years a single piece of technology has revolutionized Angela’s life: the “smart” mobile phone. She has used a mobile phone for some years but found the previous model difficult to use due to the small size of the keys. Recently she purchased a new-model phone with larger keys, larger display, and comprehensive functionality including adjustable color contrast, adjustable text size, zoom functions, digital maps, GPS, wireless and near-field communication (NFC), and different methods of output (text, pictograms and audio).

It has been many years since Angela first visited the Science Museum (Galileo was still a scientist and astronomer rather than a satellite system at that time), so she does some pre-trip research about its location using the Internet. Then she pre-sets the location of the Science Museum into her smart phone. Once she leaves her house, she is able to consult her satellite-based positioning and route guidance system. She is informed audibly of the directions to take via an earpiece, which means she can leave the phone (and digital map) in her pocket. This is more reassuring to her as it enables her to focus on the route ahead rather than a device in her hand. Because the digital map is highly detailed and regularly updated to take account of things like road works or re-modeled pedestrian crossings, or even re-sited street furniture, she is able to rely on the audible output.

Halfway through her journey she receives an audible warning that the presence of ozone is above the recommended level in that area. To avoid a possible asthma attack, she accesses a web-based journey planner on her smart phone to adjust her route to avoid the environmental problem.

Soon Angela arrives at the museum. Upon entering, her smart phone switches seamlessly from satellite-based navigation to wireless-based, as the museum is equipped with a dense wireless network. As the phone is NFC-enabled, she is able to pay her concessionary entry fee by swiping the phone a few centimeters from a reader, with the fee automatically deducted from her credit account.

She has arranged to meet her friend Rosemary in the café on the third floor. To find the café she consults the map of the museum on her phone display and plots out an appropriate route based on her personal profile. This route will include some stairs to provide beneficial physical exertion. The map is able to display multi-floor visual representations of the museum and alternative routes between amenities and exhibits when required; Angela is able to click on features of interest, and in this way soon locates the café. She is also able to access information about the café’s menu and services. Within a few minutes she has met up with her friend. Angela is happy that the powerful functionality of her smart phone combined with satellite and mobile technologies, and the wireless and sensor networks deployed in the city and on the building, have helped her enjoy a hassle-free and health-beneficial trip.
Pete is 70. Due to a worsening eye condition, he finally gave up driving two years ago, but since then he has found it difficult to maintain his previous social life. After several decades of relying on the car, he feels he has “forgotten” how to use public transport. Moreover, he has been put off by stories of complex fare structures, unreliability and anti-social behavior. He has lost his confidence in public transport. However, tonight Pete is due to attend a concert in the city center, and he decides to set himself a challenge: to attend by public transport. First of all, Pete carries out some pre-trip planning. Using the Internet he accesses details of the railway timetable; he needs to take the train in order to travel from his suburban town to the city centre (Central station). He knows that Central Station isn’t very close to his final destination, but from his research he discovers that the “Quaylink” bus departs from just outside the Central station and takes him to the quayside area and so within walking distance of the concert venue.

Reassured by this pre-trip planning, Pete sets off for his local station. His first step is to purchase his ticket using the smart card that he originally obtained for use in his local library, but which also has a transport application through an arrangement with the local transport operator. The smart card automatically deducts the cost of the ticket from Pete’s smart card balance. By swiping his NFC (Near Field Communication)-enabled mobile phone against an information point, he receives an audio message that informs him of the time of the first available train and its time of arrival at Central station, plus additional information about the frequency of the train service.

On his journey, Pete realizes he will travel through the village where his friend Graham lives. Having not seen Graham for over a year he decides it would be a great idea to stop off briefly for a cup of tea. He calls Graham on his mobile and arranges to meet at the station café.

After an engrossing conversation, Pete realizes he risks being late for the concert. His fear is worsened by an automatic alarm on his mobile phone that is triggered when he misses the next train. Because the system knows Pete’s current location and the time, it notifies him that there is not another train for half an hour, but the bus number X11 runs from the adjacent bus station in ten minutes. This service will arrive at the main railway station in time for him to connect to the “Quaylink” service. All this information is relayed to him in audio form because of his poor eyesight. On boarding the bus, Pete uses his smart card to pay the fare. Meanwhile the onboard information system informs him that his bus will arrive at bus stop R, whilst the “Quaylink” service will depart from bus stop T within five minutes of his arrival. He is advised that the walk between the two stops should take only two minutes. Pete discovers that his train ticket will also be valid on the “Quaylink” bus due to an arrangement between the operators.

Suddenly aware that he has never visited the concert hall before, he remembers comments from friends about how large the venue is and how many stairs there are to negotiate. He decides to find out more about the physical access of the building by accessing a point of interest database on his mobile phone, finding reassurance that there are plenty of lifts – and assistance if required.

Pete enjoys the show and feels that he will be much more comfortable using public transport in the future due to the assistance, convenience and reassurance that technology was able to provide for him. On the way back home however, Pete misses the last train. He is not carrying enough money for a taxi and starts to panic and hyperventilate. Using a speed call emergency number on his phone, he reaches a friend who calms him down. At the same time this number activates a localization service which determines which person from Pete’s network is closest to him, and notifies this person to pick him up and bring him home.
Supporting Physical Mobility

Mobility and Transportation

Zooming along a familiar winding road on his way home from his Thursday consulting session, Tom turned off the autopilot in his leased electric car – enjoying the feeling of control. He likes to take over from the autopilot to keep up his driving skills and anyway, his coach encourages him to practice as much as possible without automation. Tom interacts with the autopilot via voice commands, as it understands natural language. He would sit and say “Hi Auto, take me home, please.” Tom liked to treat it as Auto. “Sure.”, replied Auto. But as Tom this time was taking control, Auto just monitors his driving and advises about the directions to take, as a regular GPS navigator.

Tom allows himself the luxury of the leased car since his 75th birthday while he is still commuting to his part-time work – he is actually enjoying helping a couple of young kids starting their own bakery. But now a chime suddenly interrupted Tom’s thoughts – the Auto’s automobile safety system detected an attention lapse by his eye movement pattern and by EEG measurements using remote laser sensors. The chime came just in time – he almost hit a pedestrian crossing the street in the front of his own house. This does not happen frequently in the outskirts of the city.

The garage door, as well as the front door opened as soon as the security system in his house detected the RFID signal transmitted by his special watch. He appreciated the welcoming whiff of balmy air activated by the remote climate control anticipating his arrival, and the welcome of his companion robot, which helps him inside the house. At the same time, Auto started a self-cleaning process both inside and outside the car, using a built-in water-saver cleaning device. After which it parked itself in the garage and initiated its fuel-cells charge process.

Suddenly, the ambient living system inside the house told Auto to ignite the engine and prepare to go, as Tom was not feeling well. Considering time-factor, the house decided that calling in an ambulance could be too late. The companion robot helped Tom going to the car, gently laying him inside. Auto knew already what to do exactly, taking Tom to the nearest hospital with signaled emergence march. Staff in the hospital was already notified about Tom’s arrival, waiting at the door with a reanimation kit if that was necessary. Fortunately, Tom fainted due to low blood-pressure, and there was no immediate danger to his health. Accompanied with his daughter Maria, who was also notified by the house, Tom agreed to sleep in Maria’s home. “This time, I want you to take me to Maria’s house, Auto”. “Already going sir. I’m glad you feel better now”. Replied Auto. “Yes, thank you Auto”.

Independent Living
How technology can assist in health-related activities (remote health monitoring, emergency assistance, sensing environments, exercise assistance, prescription reminding, etc). Besides monitoring, it includes rehabilitation and disabilities compensation, Caring and assistance regarding health related interventions.
Maria is a 70 years old lady living in a fancy apartment in the city center. She used to work as an art consultant in the city museum. Ten years ago, she underwent a knee prosthetic and is now retired. Even with motion limitations, it will not be this problem that will prevent her from living her life as she wants. In fact, she has a strong character and she does not admit a change in her habits.

Her two children live in outside the city and do not have the possibility to visit their mother as they would wish. Their biggest fear is related to the possibility that Maria could fall in her apartment and not be able to ask for help. To worsen the situation, in the last year her other knee suffered an aggravation augmenting the risk and the consequences of a falling.

Therefore, due to these problems, and trying to avoid the alternative option, hospitalization or going to an elderly residence, Maria accepted to have installed in her apartment a supervision system integrating a set of different types of sensors (presence, floor pressure, cameras, etc) that connected to a network of health caregivers and practitioners, health institutions and their children would be able to monitor her movements highlighting if any motion anomaly occurs.

The system is not invasive and comprises a set of touch screens all over the apartment. All her daily activities are informed through a responsible caregiver who interacts with her through the screen located in the room where she is.

In the morning, Maria was extremely excited because her two children and grandchildren were going to visit her. As so, she tidy up the apartment and then she went to the bathroom to take a bath before leaving to the supermarket. When she was leaving the bathtub she felt dizzy and fell. Immediately the pressure sensors in the bathroom floor were activated and the responsible caregiver appeared in the touch screen calling for her. Maria answered saying that she was ok, but she could not get up alone so the system automatically alerted the emergency services and the caregiver continued interacting with her just to be sure that she remained conscious.

At the same time, her two children received an alert on their mobile phones informing about their mother’s situation and establishing a video communication to check if the emergency services were already at the place. They verified that she was already laid down on her bed and that the doctor was making a diagnosis. Fortunately nothing had been broken and her prosthetic knee was intact, and although she suffered several bruises, they were nothing to worry about. She only needed to rest for a while.

Of course, that the dinner with her children and grandchildren was postponed for another day…
Patricia awoke just after dawn as usual; just before her smart home monitor system triggered her wake up alarm and turned on the lights in her bedroom.

The small visual display beside the bed indicated that Patricia had had 7.5 hours of sleep with a sleep quality index of 75%. "Not too bad" she thinks. Non-contact sensors located under the mattress, recorded motion, respiration, and ECG data throughout the night.

As Patricia had grown older a good night’s sleep had become a luxury. Patricia, like more than half of all adults over 65, suffers from a sleep complaint. However, some recent orientations suggested by her doctor seem to be helping improve her sleep quality.

In addition to the sleep issues, Patricia has diabetes type 2 and due to her weight she has not travelled far from her home for 3 years. Patricia is prone to bouts of depression due to her health and life setting. Her GP and care providers’ are aware of the situation and her dwelling has been fitted with mechanisms and sensors which are aware of her cognitive and emotional states. When triggered they inform her family/carer’s and some form of intervention is initiated.

Patricia motivates herself to get out of bed when a bell chimes, a pleasant sound reminding Patricia to measure the level of glucose and cholesterol on her blood. Fortunately, they were within the normal levels.

After breakfast, Patricia decided to go to the living room to read. While she was moving from the kitchen to the living room she suddenly starts feeling an extremely sharp pain in her heart and the cognitive sensors assess what could be happening and determine that Patricia is having a heart attack. The monitoring system automatically instructs her to make a heart massage while the emergency doctors are on their way…
It is 8 o’clock in the morning and Howard starts listening to a voice calling him. He opens his eyes and verifies that it is Joshua, his latest humanoid robot acquisition that is trying to wake him up. It is time for his daily monitoring of the blood cells counts.

Howard is 65 years old and 9 months ago was diagnosed a colon cancer. Since then his life turned upside down, and suddenly he saw himself in a very painful situation that he had to face alone once he doesn’t have any more living relatives.

When he started the chemotherapy sessions, he was told about a new monitoring system that comprises a humanoid robot and that could help him at his house and with his treatments. At the beginning, he didn’t like very much the idea of having a robot nursing him. But after some workshops he realized that with this he could have a good monitoring system of his health as well as a companion.

According to his cancer type, he needs to get the treatment once a week. Meanwhile he needs a systematic blood cells counts monitoring in order to be sure that no serious complication arise due to low levels of blood cells.

Howard is still sleepy while Joshua takes a blood sample from a vein in Howard’s arm using a test called a complete blood count (CBC). After that, Joshua places the sample in a special device that automatically examines the blood and sends the analysis results immediately to Howards’ doctor. Then, Howard gets up of the bed and goes for his daily shower.

When he returns to the bedroom, Joshua has already established the video connection with Howard’s doctor that is checking the blood analysis results. Fortunately all the blood cells levels, white and red blood cells and the platelets, are normal according to his condition. After talking to Howard for a while, the doctor closes the communication channel.

Howard is now in good shape to go for a walk, especially because the day is shinny and warm…
Jennifer is a 76 year’s old retired nanny. In spite of feeling well, she had to stop working 6 years ago due to an aggravation of her diabetes condition. Jennifer lives with her husband Nicholas, who unfortunately suffers from osteoporoses, in a small house near downtown. As they are quite isolated from the rest of the population, they had a monitoring system installed, integrating among other devices special mobile phones with medication assistance functionality. Using this system, they feel more accompanied and assured that the right medication is taken at correct time. Jennifer and Nicolas are assured that their personal information held on these special mobiles is kept secure and private as they are CE rated and abide by a regulated standardization that has been passed across the EU.

During the morning they stay at home, but usually after lunch they go for a walk taking this opportunity to do some supermarket shopping. Before going out, Jennifer goes to the kitchen to grab her special mobile phone (that keeps them tracked while walking) to check the shopping list and notices a flashing hint reminding to buy a new batch of diabetes pills. This reminder has been automatically sent on her special mobile phone by the monitoring system. In fact when the pills in her dispenser are under a threshold, the dispenser sends an alarm to the system that reminds to the appropriate person, via the chosen device. Since Jennifer can buy the prescriptions by herself she receives the reminder on her mobile phone. Jennifer reflects on how useful this reminder is, especially because it informed her before she leaves home.

Jackie felt a soft nudge and looking up from her book saw CLARC’s blue eyes shining at her. CLARC (Care and Living Assistive Robotic Companion) tilted her head pointedly looking at the mobile medical unit on the tray it was carrying. Jackie smiled and sighed placing her finger on the unit’s sensor pad, while CLARC checked her blood glucose. CLARC’s eyes changed to green, which represents the all clear situation. Jackie picked up her book again, but was interrupted by a soft chime. CLARC’s eyes, blue again, were indicating towards the small pile of pills that had dropped onto a plate while a glass of cool water was being poured. Jackie didn’t know what she would do without CLARC to remind her to monitor her blood glucose and take her medicine. All those pills, it used to be so confusing to remember what to take, how much, and when. Jackie was lucky that she could now control her Type 2 Diabetes through oral pills, diet, and exercise.
Roberto suffers from high cholesterol and high triglycerides. Due to his health condition, he needs healthy lifestyle assistance otherwise can suffer consequences.

Today his virtual caregiver, after the good morning regards, suggested an hour of exercise and for that Roberto has to wear a special t-shirt made of fabric sensors that allows the system to track his physiological data as well as follow his movements, recreating them on his bedroom big wall screen.

The system begins the exercise program by projecting the routine onto the wall and played music through speakers. The sensors in the garment wirelessly transmit the data to the assistance system in which they are interpreted and mirrored on the projection of the exercises. To begin a game is played to warm up his joints and muscles. The game consists of trying to reach up to touch different shapes as they appear and once touched they disappear. Feeling nicely warm Roberto took his Pilates band and following the system’s instruction worked on his muscles toning exercises. After stretching out, Roberto went for a quick shower.

After his bath, Roberto remembered that he needs to buy some food; nevertheless he can only consume products that do not contain lactose because of his allergy. He moves to the touch screen on the kitchen and asks the system to help him with the shopping list. After a while his printer starts printing the suggested list and then he leaves for the supermarket.
Manfred, 79, and although retired he likes to maintain some healthy activity, especially because he is overweight and he started to have some related health problems.

Manfred, supported by a smart cane, walked into the kitchen later than usual, a monitor positioned in the kitchen with an interactive interface reminds him of the session with his remote coach. But Manfred did not start his coaching session yet – he was a little embarrassed since he has not committed to regularly doing his daily exercise routine. Instead, using a voice command, he started his exercise game routine. Being overweight most of his life, he had not been much of a jock, but this game-based system was actually fun! It was physically and mentally challenging, without embarrassment, within the privacy of his bedroom. He was totally amazed because he was clearly improving – imagine at his age! Today, he pushed himself particularly hard because he wanted to surpass his previous record. He knows he can push himself hard because Manfred is well aware that the system monitors his vital signs and does not let him overdo it. This close monitoring is particularly important because of his congestive heart condition diagnosed a couple of years ago.

Manfred had the opportunity to further his knowledge of using the internet by taking an evening class, which was taught by local secondary school students. There he learned how to take part in the social aspect of the web by using internet forums and websites to discuss and investigate about his condition. He has found a new social outlet online, meeting people in similar circumstances with similar conditions. They discuss how they are coping and swop stories of their conditions and how they can alleviate some symptoms and improve their health generally.

The results of his exercise were instantly communicated to his coach, and when Manfred actually initiated the session there was already a message praising him for his accomplishments. The coaching system had already incorporated today’s weight measurements (automatically assessed by the load cells in the bed as well as a scale in the floor mat in the bathroom), blood pressure – measured by a sensor in his watchstrap, and the sodium ion concentration in his urine through the chemical analysis performed by the toilet. The coaching system, as well as his coach, was pleased with his outside activities, socialization and diet. Even his balance had improved so much that his smart cane is no longer required as much when he gets up at night to go to the bathroom, rather than providing him with mobility support.
Marilyn is 75 years old, suffering from heart problems. As she lives alone and due to her health condition, she has acquired for her home a healthcare system that is connected to a healthcare center providing support and assistance in case of need.

Today, Marilyn got up as usually and after a refreshing bath she went to the kitchen to prepare breakfast. Meanwhile, the door bell rang; it was her granddaughter Anna that was passing by and took the opportunity to visit her grandma. Marilyn was really happy to see Anna and invited her to join in for breakfast. After a while, Anna noticed that her grandma was desperately looking to a set of pill's boxes and trying to remember which one she should take.

In the day before, Marilyn had gone to her heart medical doctor at the local health center to have a routine consultation. As her heart is getting weaker day by day the doctor passed a prescription with a new kind of pills.

Thanks to the installed healthcare system, Anna got the opportunity to contact her grandma’s virtual nurse and ask for the right pill that Marilyn should take. This healthcare management system knows the person’s status and needs and is on call at any time and in any place, to guide and support the person. This system acts as a knowledge source, a personal decision-support system, health and fitness coach, personal dietician, and much more, giving instantaneous feedback to the user, raising an alarm or informing professional or informal care givers when needed. This also includes the possibility for action related to behavior management by giving relevant education information and checking adherence to treatment programs (medication or exercise).

Unfortunately, Marilyn’s virtual nurse was not sure about the right pills, so it forwarded the communication to Marilyn’s heart physician that promptly accessed her treatment file and answered accordingly. Marilyn smiled again and told Anna that she was getting really old and with memory issues.

This system creates a communication channel with the Marilyn’s network of medical professionals who are involved in her current treatment plans and link her to diagnostic and treatment services. All care providers and their supporting facilities like radiology, laboratories and pharmacies use electronic health-record systems that are connected to a secure health-information-exchange network which enables easy access to the relevant data using a role- and task-based access-control system that is in line with the consent rules controlled by Marilyn. In this way, they all have constant access to up-to-date Marilyn’s information, which is of course important in case of emergencies.
Ita is a senior nurse and has now started to work with a new system for tele-consultation. The system is suited for people with some disabilities or health problems that need continuous medical treatment. Whenever a situation arises and the patient is unsure about what to do, an expert can be consulted.

Frank, 78, suffering from kidney failure is gardening at the Smith’s house, a young couple that moved in to the neighborhood two years ago. As they are extremely occupied Frank offered his gardening services to them being in this way also occupied during the day. Frank never leaves his house without his new smart mobile phone integrating a tele-consultation system that is connected to the local care center.

Rita receives a call from Frank; he is extremely nervous and she asks him to calm down otherwise she couldn’t understand the emergency situation. Frank is showing his hand with blood all over and is begging for help. Rita calmly asks Frank to show her the wound through the smart phone camera and observes that it is quite ugly indeed, she also consults Frank’s medical registry and notices that Frank suffers from kidney failure, so she cannot administrate a common treatment. After explaining to Frank what he should do and what kind of medicine he can take, she waits for the results. Frank is now taking care of his wound and much more calm…

Frank is really happy with this service. The use of a tele-consultation centre ensures that an expert is immediately available – which will mostly be impossible when calling the patient’s practitioner. Rita helped another patient and is now ready to assist another call.
Jim is 87, and suffers from a relatively mild form of Alzheimer’s disease. The effects of the dementia on his behavior are kept under control by drugs, and drugs also allow a fairly good functioning of amnesic functions.

Nevertheless, quite often Jim is not able to correctly develop and fully carry out plans for his tasks, so his ability to successfully conclude many activities of his daily life would be seriously compromised without a good cognitive support system.

But his smart home knows what he is doing, at any moment in the day:

- The home knows Jim’s world, his habits, his preferences, the way he usually does things; it has been learning this through observation and recording for years, even since before Jim developed Alzheimer’s.

- The home knows what Jim is doing right now: it knows where he is, if he’s standing or sitting, if the TV - or any appliance - is on or off, if he’s using it or not, what objects he is handling. By comparing observation and stored information, the home is able to recognize - with some likelihood - which activity Jim is performing, and subsequently the expected outcomes, the risk factors associated to that activity etc.

- The home is thus also able to actively support the correct execution of the activity, by seamlessly comparing the execution flow with a “normal” one (a “model” stored as a result of past observation), and by guiding Jim through a safe and effective sequence of steps, by means of ubiquitous audiovisual support.

Jim is usually alone during the day, while a care giver stays at his home for the night: his children don’t live in the same area of the town, and they are at work almost all day long. But they worry about Jim’s wellbeing and safety and are always ready to intervene in case of need.

They know that they can rely on Jim’s AAL system, on its capability to keep the situation under control, and to inform them when something goes wrong.

Jim likes to go out for a walk in the neighborhood, to the park, to the main square, or to the nearby grocery to buy some food. When he does this, the system automatically sends a message to Jim’s relatives and/or to the care giver. This message is nothing alarming; it is a normal event, but it is good that they know that he’s gone out. The same kind of message is sent when Jim comes back home.

But two hours is probably a little too long. A new message, telling them that he hasn’t come back, could help. Just to let them know, so that they can try and contact him to see if everything’s OK...
Thomas is a 70 years old person that despite his age feels healthy and eager to remain active as long as possible. Unfortunately, ten years ago, Thomas suffered a car accident that besides immediate severe injuries also left him with permanent ones, namely the need of having daily oxygen breathing and the need to use a wheelchair for the rest of his life.

Along with other sensors and equipments Thomas wheelchair makes use of sonar technology to detect obstacles and modify his driving commands to ensure that the platform does not collide with any obstacle. Also the smart wheelchair is equipped with robotic manipulators, which can be used to manipulate common household objects.

With the aim of improving his quality of life, Thomas installed at his home a system that manages the quality and quantity of oxygen that is needed. Also, in order not to be dependent from others for transportation, Thomas managed to buy a car adapted to his health condition.

When Thomas arrives at home, and as his car is equipped with an automated parking system, he manages to activate the system relieving him from many difficult maneuvers. When the car stops, it begins the procedures to un-dock the smart wheelchair and starts moving towards the house. Through the control panel of his smart wheelchair, Thomas can activate the oxygen system so that shortly after he can start to receive the necessary dosage of oxygen.

Eight o'clock in the morning, as every day, Anna is going to have her breakfast. Anna is 79 years old, and since 6 years ago, when she underwent a hip prosthetic, she usually tidy up the house before performing the rehabilitation exercises. Although the rehabilitation started many time ago she still regularly goes to her physiotherapist office to preserve as much as possible her motion abilities. Anna suffers of a serious form of arthrosis that is going to damage with a notable pain all her articulation, especially the hip and the hands. Even if her left hand is almost closed, it will not be this problem to prevent her from living her life as she wants, in fact Anna as all the women of her family, has a strong character and not admit to change her habits so simply.

Given this fact, the family managed to install a system in Anna's house that besides monitoring her movements is also capable of remote tele-operation. This characteristic is of extreme importance for Anna's rehabilitation exercises.

Today, just after finished to prepare the room for the rehabilitation activity, she receives the call from her physiotherapist, and his image appears on the projection screen beside her bed. After the regards, the therapist starts indicating where Anna has to put the patch on her body. Such patches are sensors that will allow the system to track physiological data and to track the motion of the joints. Anna knows that, with the help of her system, she can perform the exercises autonomously, but she prefer to work with the therapist, especially because he is a so courteous man and she loves to chat with him. It is not the first time that she needs to change the time scheduled for the rehabilitation exercises. Sometimes the therapist isn’t at disposal for the time Anna requires; just in that case Anna uses the automatic training.
How technology can support the continuation of professional activities. Occupation in life can look very different for individuals, depending on the background work structure, sector, individual goals, capabilities, flexibility, opportunities, and functional ability. It covers both pre-retirement and post-retirement activities. In fact, in face of economic crisis and the growing pressure on the pension systems, it is likely that the notion of retirement as an abrupt event will change in the coming years. This setting includes both voluntary and paid work.
Mario is 70 years old and is a skilled worker who works in wood and inlays objects. He is skilled at restoring old small wooden objects. He is restoring a wooden jewel box for a museum. He follows directions given to him by the director of the museum to complete his task.

Mario has a smart workstation at which he carries out his activities. This workstation is made up of a desk with two sections: one with a PC (monitor, case, mouse, keyboard and webcam) and the other with tools to work in wood. Mario’s workstation is able to recognize if he is working with the computer or in the other section:

- If Mario is at the PC, the lighting of the workstation is changed automatically to facilitate Mario’s working; he is presbyopic. There is also a set of sensors that recognize the distance between Mario’s and the desk (during the day Mario often changes the height of his chair) and the height of the monitor is automatically varied in order to give Mario the best visibility;

- If Mario is working with instruments to inlay the wood, the smart environment recognizes which tool he is using and varies the light accordingly; the change of air is also automatically increased because he works with chemical agents and produces wood shavings and dust.

With this smart workstation, he can simultaneously work on the old wooden jewel box and follow the directions given to him by the director of the museum. Mario is also able to use his computer with special software and interfaces that facilitate access and control of the PC.

Thanks to this special workstation and easy use of the computer, Mario is able to remain in touch with many international experts who contact him seeking his advice. He is also able to teach remotely some lessons about restoring wooden objects to students at an art school.
Helen is 63 years old and is a psychologist. She is a professional and works in her office. She actually works in the Human Resources department of a company and has been working there for twenty years. The managers of the firm asked her to create a database of employees’ skills, aptitudes and ambitions. She has therefore organized a meeting with workers and she enters the information she obtains onto the database.

She would have used a PC for this kind of work in the past but since a health decline in the last 18 months she now uses a special computer workstation for this task that has been adapted to her changing needs.

The smart PC is able to recognize who is using it thanks to its biometrical system: access to the database on the employees is allowed only to Helen and some managers.

When the workstation identifies Helen (who’s employers have trained her to use the new biometric system), it adopts working conditions suited for Helen. She is unable to use a normal keyboard and suffers from arthritis in her finger joints; she also has carpal-tunnel syndrome. She therefore uses two different interfaces to use the PC: a tablet keyboard and a voice keyboard. When Helen uses the first system, she writes her notes using a special pen directly on the tablet keyboard: the tool recognizes Helen’s calligraphy and compiles the words in text files. If Helen feels tired in her hands and she prefers not to grip the special pen, she uses the second system, a voice keyboard. This recognizes her voice and reports the words she pronounces onto text files in the database. The voice keyboard is smart because it recognizes and transcribes only the words spoken by Helen, not by other employees in the Human Resources office; it is also able to distinguish vocal commands from sentences dictated.

Michael, 60, has worked for the post office for 15 years. He started out by shifting stock and moving goods around the storeroom. This was very physical work. At the age of 50 he started to experience back problems which made it difficult for him to carry out his jobs. His employers at the post office offered to retrain him to handle the stock ordering and stock-taking instead. He took part in an internal training scheme where he learnt to use the post office databases and ordering systems. He now handles the administrative side of the stock handling. His experience in the storeroom helped him to bring new insights to the ordering process and his employers are very pleased that his experience has helped them to devise a new stock ordering process which has saved them some money.
Anthony, 69 years, is at a pre-retirement phase, still working in a consultancy company. He is very knowledgeable, and the company tries to keep him inside as long as possible. Anthony enjoys working in this company characterized by skilled staff of diverse generations, ranging from the “baby boomers” to the youngster ones. They work well together, but that was not always the case...

Although there is a gain in strength, innovation knowledge and experience from having generational diversity, there is also the potential for disaster, keeping them together carelessly.

Intergenerational relationship problems arise not only from distinct working styles, but also from the preferences and values characterizing each generation. For instance, while Anthony and his colleagues of the same age liked to put a bit more effort of their own to get things done, others like to be more collaborative and adaptable. The youngster generation, on the other hand, is seen as extremely “tech-addicted”, preferring text-based and video-conference interaction, which is significantly distinct from the previous generations.

Fortunately, the company soon realized the problem, and understanding the concerns associated to divergent working styles from distinct generations, raising the necessity of an organizational change. As a result, working principles and policies for handling generational conflicts were clearly formulated and adopted; newer communication tools were adopted, aiming at easing the compatibility between working styles, and increase the ability to communicate and work together.

The company is now proposing Anthony and other colleagues who are also retiring, not to quit their jobs and remain working, even if it was at a reduced level and undertaking affairs from their homes, allowing the company to continue profiting from their skills and knowledge. Having said yes, considering the concerns from intergenerational conflicts handled before, it is likely that this newer situation of retired working from home, together with regular staff, might cause newer, unhandled, organizational concerns...
ike in the past, Jack is heading to the headquarters of WiseCompany where he used to work as a senior project manager. But today he travels in a relaxed mood. His destination is not his old office where he would get immersed on the daily routine problems, all waiting for urgent solution.

Now that he is retired, his destination is the SeniorClub, so he is not under stress and can spend time observing the frenetic movement around and enjoying his trip.

Concerned with the prospects of the first wave of brain drain as baby boomers generation retires – i.e. face the sudden departure of thousands of skilled workers, WiseCompany launched the SeniorClub as a mechanism to keep the links with their best knowledge workers after retirement.

The club offers conditions for socializations of former employees and among them and active (young) employees. Furthermore, retired experts are encouraged to continue contributing to some high-level activities of the company, e.g. coaching or advising in critical projects, participation in strategy and roadmap definition brainstorming sessions, or acting as consultants in specific tasks.

The Senior Club offers a nice lounge / meeting facility, with free access to ICT equipment, refreshments, entertainment facilities, etc. Furthermore, members can get some other fringe benefits and some payments as a result of their contribution to the economic activities of the company.

Jack joined the SeniorClub initiative and today he is going to discuss with his fellows and some young engineers some strategy for the introduction of a radical new product in the market.

It is very rewarding for him to feel that his accumulated experience and mature knowledge is appreciated by his former employer and that he has the opportunity to continue active. Keeping the social links with his former colleagues while given the opportunity to stay in touch with new developments and trends is also very important for Jack. Furthermore, his contribution to the company is rewarded with some payment and fringe benefits that help him keep is standard of life.

Jack feels lucky for having this opportunity but a sad though came to his mind. He just remembered his relative Fred, that used to work for a SME and has no such opportunity to keep and active life. Last time they met at a family gathering, Fred looked a bit depressed...
Manuel just finished his breakfast and while enjoying this lovely morning of early Spring, he is now logging in the ProSolve portal. ProSolve is an electronic marketplace for innovation and problem solving allowing a community of retired highly skilled professionals to address problems and innovation challenges posted by client companies. A number of mechanisms are implemented in this marketplace, including:

- Open innovation challenges. A company looking for new ideas and potential solutions places a “challenge” in the market and indicates the associated monetary value. Members of the pool of experts of ProSolve can offer ideas / solutions (bid) on a confidential basis. The author of the idea / solution picked by the client company will be the one to be paid.
- Target problem solver. A company wants to find an expert with the right profile to perform a specific problem solving task. ProSolve helps matching potential experts with the requested expertise and facilitates the negotiation and contractual arrangements as well as other due diligences.
- Assistance / coaching. A company needs consultancy / coaching on some best practice. Potential experts are identified by ProSolve (matching mechanisms) and when agreement is reached the task is contracted.

ProSolve plays an important role in all issues related to confidentiality, intellectual property, contractual aspects, and quality monitoring. After browsing over the new opportunities, Manuel found an interesting challenge and started digesting a solution based on his accumulated experience but also considering the pleasure of competing to offer a winning idea. Two weeks later, Manuel received the great news that his idea was selected. Wow! He had been participating in other challenges before without being selected ... nevertheless he continued just for the pleasure of exercising his knowledge and experience. But now, the 10 000 euros reward for his solution are certainly much welcomed and right on time to plan his summer holidays!

While enjoying the news of the day, another idea came to his mind: It would be much more interesting if ProSolve evolved from a marketplace to a real community offering social networking aspects and also mechanisms for easily teaming up with our experts to work together on a problem instead of being alone.
Pedro is 67 years old, a university professor who has reached retirement age and has thus had to give up teaching in the faculty of Economics where he has taught for more than forty years. When he retired, two years ago, he considered himself happy since he was able to dedicate time to writing, one of his passions, to sports and dedicate more time to his wife, their children having long left the family home.

A few months ago his wife died, which has meant a drastic change in both his personal and economic situation. As regards his personal situation, his spare time has increased considerably while at the same time his interpersonal relationships have reduced in number and quality. Economically he is facing a considerable increase in his monthly expenditure, now that he has to afford to pay someone to fulfill the care needs that used to be fulfilled by his wife. This, added to the steady loss of buying power of his pension may, in the medium term, result in economic problems.

Talking the subject over with his friends, one of them told him about the existence of a consultancy firm in his city that regularly reaches agreements with independent professionals, who are experts in certain fields, to cover work contracts usually related to international institutions. On talking to the consultancy firm, he finds that it is indeed true that certain agreements of this nature are possible, always assuming that the retired person is legally able to carry out the service and bill for it accordingly. Whilst chatting to his financial advisor he learns that the government has made a recent change in the law that allows retirees to sign up on a part time basis for the execution of professional services.

Working it all out on paper, with the time that the consultancy is willing to guarantee him, Pedro thinks he would be interested, since it would give him a guaranteed increase in his level of income, would cover his new expenditures and at the same time would be compatible with the time he has free and would additionally afford him a chance to increase his social and interpersonal relations. As an aside, he tells the consultancy that his health seriously limits his ability to travel, for which reason his services should be limited to his immediate environment or be given through new information technology. The consultancy makes it clear that in this regard he will have no problems, since they dispose of the necessary methodologies and technical equipment and communications to allow him to work, even through video conferencing.

On reaching an agreement, Pedro starts his working activities and a few months later finds himself very satisfied. His expectations have been met and apart from a few problems related to the use of some technology (which were resolved by the training provided by the consultancy) he has adapted perfectly to the new situation. His next objective is to diversify his sources of work so he is thinking of the possibility of affiliating to a body of retired professionals that offers similar opportunities, or in the case that no such body exists in his city, attempt to found one himself. To this end he is using his recently gained knowledge of the Internet to look into the existence of this type of association. He also plans to offer independent consultancy advice for employers working with other older employees so that they can develop new business models to take advantage of the senior members of their workforce.
George is a senior electrical engineer that used to work for the national energy distributor as a public installations analyst and inspector. Although 65 years old he is a healthy man and felt frustrated for being obliged to retire so soon and at the same time depressed because he was at home with nothing interesting to do; he was feeling that he needed to give his brain some activity.

One day, when navigating on the Internet, George found a website that attracted his attention – the ActiveSeniors Community. This website supported a community of senior people that was created out of the necessity of people to remain active after retirement through sharing with others their experiences, skills and knowledge. The main objective of ActiveSeniors is providing professional assistance to people, companies or organizations located in developing countries through unpaid/volunteering senior expertise.

George felt enthusiastic with the ActiveSeniors Community, especially with the idea of travelling to a new country and of putting his brain in motion again, and registered immediately as a new member. After the registration process George received a welcome letter and a collection of information containing the community rules.

A couple of months later, George was still waiting to be contacted for an assignment and he started to feel anxious with the situation and remembered to start looking for missions. After a couple of days searching he found a small electrical company in Cabinda, Angola, that was passing severe financial problems. George contacted both ActiveSeniors and the small Angolan company and after all the arrangements were properly made George went to Cabinda.

When George returned from Angola he was so happy that his relatives realized the importance of keeping retired people active…

In fact, contributing to help a region in need and also having the opportunity to travel was a great reward, especially considering that George’s pension is enough for his needs. But the lack of opportunities to contribute is something that still worries him … By the way, thinking about the difficulties, he also felt a bit uncomfortable for having to perform his mission alone and having to do some field work in Cabinda to better understand the problem before he actually could contribute to solve it…. As a result his contribution was a bit limited as the resources for the mission ended…
José is apprehensive today. In fact he has been worried lately. Everything was different two years ago when he and his friend had this idea for an innovative low consumption air conditioning device and started their FreshAir company. The two engineers soon developed the new equipment thanks to their dedication and enthusiasm. But now they are facing difficulties. They don’t know much about marketing or internationalization, although they understand the need to target a global market. Unfortunately they spent all their resources in the start-up phase and now cannot afford to get assistance from one of those big consultancy companies … Either something happens or they may have to close and fire their employees soon…

Three weeks later …

José and his colleague are having a meeting with Carlos and Ana, two members of the local branch of the Regional Development Agency (RDA). After some initial contacts, Carlos and Ana spent some time in the company making an analysis of its problems and today they are presenting their conclusions. The diagnosis seems logical to José. It is clear that FreshAir needs some coaching and specialized guidance in two crucial areas – focused marketing and internationalization. But they cannot afford the high costs of such specialized assistance. RDA, an organization funded by the local government and that aims to promote local businesses, made the analysis for free. Unfortunately they do not have the expertise to help in the next phase …

Guessing the worries passing through José’s mind, Ana told them that there is a potential solution. Then she mentioned the ActiveSeniors association …

Pedro is a retired professional, member of ActiveSeniors. Based on his specific expertise and experience in marketing, he was invited to join a team involving 2 other members of ActiveSeniors with competencies in internationalization and air conditioning. Together with Carlos and Ana from RDA, this team started a temporary collaborative network with people from FreshAir. After 3 months the first results are starting to show up. The ActiveSeniors team not only provided technical assistance and guidance, but also helped FreshAir establish some contacts with a new market in India. Now the business prospects for the young company seem brighter ...

Pedro is quite satisfied for having this opportunity to work on a topic where his experience was a real added value. He very much appreciated the diagnosis and preparatory work done by RDA, which allowed him and his senior colleagues to focus on the core issues. Working in a team was a great experience. The small payment Pedro received is also great to complement his pension and give him some better living conditions. FreshAir and RDA could mobilize some resources to pay a small fee to the 3 members of ActiveSeniors, a value much lower than the typical consultancy prices that could never be afforded by FreshAir.

Carlos and Ana got a special recognition from their boss at RDA for being successful in helping a local company and thus creating better economic prospects for the region.

José and his friend re-gained their enthusiasm and they really appreciated the value of this collaboration endeavor with RDA and ActiveSeniors. They certainly plan to keep contact and look forward to again use the amazing pool of expertise & experience available at ActiveSeniors.
How technology can facilitate socialization and participation of ageing citizens in social, leisure, learning, and even religious, cultural and political activities. Examples of focus areas include socialization, namely through communities, entertainment, learning, and engagement in civic activities.
Having a lifelong taste for playing the guitar, Arthur of 75, has finally found a way to keep up to date and accompanied in the area. He found an online community (composed of members from all ages) with the same taste as his own for the guitar playing. Therefore, Arthur managed to become an online member of such community. This community uses video and social networking to play together online.

Whenever Arthur desires to play accompanied with his community mates, he accesses the community platform and can immediately see the names and images of his regular session mates, who are also online, pop up on the screen one by one. Once they have all agreed upon the music they begin to play it. It is also possible for other community members, who enter online afterwards, to also join the group and play on.

Besides playing, the online community platform also offers its members functionalities for sharing music and chat. For each item of information, users can express judgments, remarks and opinions by means of both a facilitated keyboard or voice-recognition software, and such judgments are sent directly to the main senior coaches that manage the information or event.

Today, Arthur feels like going out. Therefore, he logs in the online community and invites members to join him at the local club tonight. After some time, he receives answers from some members saying that they would join him and that evening is going to be great because they will finally meet in person.

After having dinner, Arthur through his PDA verifies what the next bus that will take him downtown is and leaves home.

It is late night, and Arthur misses the bus back home… hopefully with the help of his PDA he accesses a community transport support group that after identifying through GPS the nearest member available, collects him and brings him home.
ill Graves, 70 years, is a healthy and happy, retired, person taking the best he can from his free time. He knows that life is short and that we need to live it well together. He is very social, engaging in civic activities of his town. He also likes to travel, run, walk, attend shows, go to the theatre, seeing movies, and most of all, giving flowers to his wife. Being so active, it is somehow difficult to handle such level of activity without assistance, given that his age his memory is not what it used to be.

In fact, he relies on a program running in his tablet, which helps him manage the events he attends. This program is part of a platform connected to his town and integrating information from several sources and services, most of it social events, including leisure, sports and shows.

The platform allows members to form small groups to jointly attend an event. Being configured and personalized to Bill’s preferences, the program tells him about what he can do interestingly each day, including a reminding to buy more flowers.
ome elderly people are looking for new ways to keep active and alert. They are responding to the advice to take care of their brain and are involved in special activities such as doing jigsaw puzzles, juggling, dancing and playing table tennis. Nowadays, games that have been specially designed to stimulate and train the brain are also available. Such games are now entertaining a new generation of computer users: elderly people who up to this time have not been interested in computer games.

One example is Elvira that has always been a fan of the bingo nights. As now she cannot anymore go to those events due to her mobility problems, she plays with her friends remotely using the bingo online forum. Nevertheless, she feels that is not the same as being out and in the company of her friends.

Fortunately the bingo institution has developed a system that allows remote playing with the feeling of being in the environment of the bingo night. The system basically integrates cameras, movement and emotion sensors and also holographic projections.

Although Elvira was not a fan of new gamming technologies and preferred real games, is now a complete fan of this system as it allows her to play as she was really in the bingo night room session.

manda is a 70 years old woman who used to attend the recreational centre of her residential area. Among several activities, one of her favorites was to play cards with her community friends.

In the last months, Amanda’s state of health began to deteriorate and she was forced to stay at home resting in her bed. Nevertheless, and thanks to devices made available by the recreational center, her passion for playing cards with her friends who are in the in the community recreational center can continue to be fulfilled. To play they use a special platform made of touch screens and monitors embedding webcams that are remotely and wirelessly connected between them. In the recreational centre, each friend has their own touch screen showing their own cards and on the table stands a monitor that shows the cards at stake. At home, Amanda has a touch screen showing her cards and a monitor that displays both the cards at stake and her friends. Thanks to the real-time communication between the different components, the four friends can talk and discuss, see gestures of their companions and interact positively.

Although Elvira was not a fan of new gamming technologies and preferred real games, is now a complete fan of this system as it allows her to play as she was really in the bingo night room session.
Bruce loves to go to the theatre and to the cinema. Unfortunately, five years ago he was diagnosed a motor disability that prevent him to go to such activities with the regularity that he desires. Hence, Bruce seeks to find a way to allow him to overcome the lack of going out so often to attend cultural activities.

Fortunately, now there is a system suited for people who have motor deficiencies and cannot move so easily from their houses but can remotely access services or events by using digital television or a facilitated computer connected to biometrical recognition systems (fingerprints, voice, optical). With this system Bruce can be identified and gain remote access to specific services like a post office or a register office and talk with workers. Bruce can also buy tickets for particular events and watch them on the television or computer screen.

Bruce usually uses this virtual service to access most of the cultural activities. Nevertheless today Bruce is going out to the local art gallery because the exhibits are of great interest and he wishes to contemplate them in loco. For that, he accesses a supported and accessible special transport service that will bring him to the gallery. When he arrives, a route plan guides Bruce through the gallery room to find the exact exhibits that he was looking for. This route is optimized by avoiding barriers that match his motor disability.

Bruce stays for hours admiring the exhibits while an online gallery curator provides additional detailed information of the art pieces on his PDA.
Joanna is a 60 years old lady that used to work as public relations in one of the biggest art gallery of in the city center.

She was forced to stop working due to a car accident followed by fire in which she was extremely injured especially in her face with a second degree burn. Since then, and taking into consideration her age, and her specific profession (where the image is fundamental), she does not feel yet the courage to go out and face all the people’s observations about her face.

Joanna’s husband, John, is a very busy man running a financial consultancy company. In spite of travelling a lot, when he is at home he dedicates all his spare time to Joanna. Nevertheless, it is not sufficient for her, and most of the times she feels alone and isolated from the world.

One of the things that make her feel isolated and depressed is the lack of human contact as well as her daily exercises at the gym. In order to overcome this, they installed an entertainment system integrating a services network where several entertainment packages are available.

Therefore, all mornings Joanna checks out on her wall digital and touch screen, which Pilates classes are about to start. Once chosen the class to attend, Joanna selects her personal avatar (Joannatar) that will represent her in the virtual class room. On a side window she notices that her Pilate’s friends, Annatar and Paulatar, are also attending the class and she feels really happy, because she will have someone known to share some thoughts while practicing the exercises.

It is almost time to start, and Joanna is dressing her special training garment composed of several sensors that are connected to the system. In this way, while she is doing the exercises at home, Joannatar is receiving information about what she is doing and reproduces the same movements in the virtual class room. She “sees” herself in the class with all the other attendants and at the same time has an audio communication channel that permits everybody to listen to the coach and to speak with her colleagues as if she was in a real class room attending a Pilate’s class.

This system brought her a different life, because in one hand she does not have to show her face and on the other hand she can both exercise and socialize.
Teresa is a Math teacher for secondary (high school) students, who retired a few months ago. She knows, as intelligent she is, that stopping right know, excusing to rest during retirement, is in fact not very healthy, and that the next logical step is to replace work for something else, indeed. As she also likes and is planning to travel a lot, she came to the conclusion she had better learn English before her husband retires too. She proposed herself to learn as much as possible of English and English culture. Teresa went to the English School of her town and, after an initial assessment; she enrolled in the third level of an elderly class.

Enjoying the fact the she is a student again she applied with vigor to learning the proposed subjects. Teresa came across that the school has also facilities for remote learning, letting students complement their lessons at home and doing the homework. She even noticed that there was a championship between the classes of the several schools. The prize would be one week traveling to London for the wining class.

Teresa finds the site quite useful and a good complement for her lessons. The site is plenty of exercises, training sections for dictation and pronunciation, and games for increasing the knowledge of English. However, Teresa feels the whole concept of the site is a bit juvenile or even childish, and her colleagues aren’t using this resource for the same reason and because the interfaces are a bit complicate for them. Nevertheless, Teresa decided to use the remote resources as there are still useful to complement their learning. The remote facilities are tailored for younger students, as the majority of the School’s students are younger, she asserts. But she decided to propose the idea of starting to provide remote learning facilities more tailored for older students, as it was predicted a greater base of older students in the future…
Hugh is a retired teacher of mathematics from the high school. Although he has 77 he feels extremely healthy and active.

He really misses his students and the interactions with the newer generations. As he used to say: “there is nothing more refreshing than teaching mathematics to students and learning from them a set of other issues including new technologies, sports news, etc.”

Hugh has a quite limited life due to his wife’s health condition. As she suffers from dementia he has to give daily support by taking care and paying special attention to what she is doing.

During the day, the only time he has for himself is after lunch, when she is going for her daily nap. This is when Hugh goes to his home office where his newest “toy” is placed, a smart workstation at which he carries out his remote teaching activities. This workstation comprises two sections: one with a PC and the other with an electronic blackboard where he writes down his lessons.

With this smart workstation, he can simultaneously expose the subject on the electronic blackboard and follow the students’ expressions in the PC monitor when giving a remote mathematics class. These classes are part of a special programme introduced by the local high school to the students that are not correctly accompanying their classes.
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