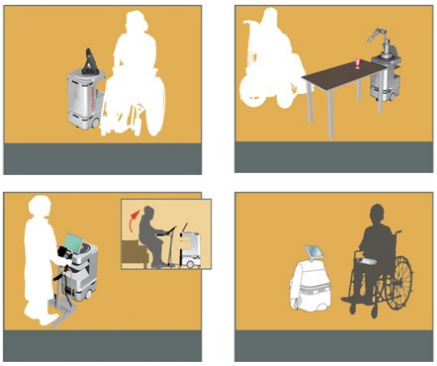

DOMEO Project
AAL-2008-1-159

Interviews results report

Document Information	
Title	Interviews results report
Workpackage/Deliverable	WP1 D1.2
Responsible	NIMR
Due Date	31/03/2011
Actual Date	20/06/2011
Type	Report
Status	Version 2.0
Dissemination Level	Public
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Project URL	www.aal-domeo.eu

Keyword:
User interview, methodology, focus group, caregivers

Summary

The socially active robots can support older people in their everyday life. The Domeo project of the Ambient Assisted Living (AAL) Joint Programme of the European Union aims to develop a new companion robotic system that would allow cognitive assistance to older people living in their home. It is based on robotic functions and telecommunication services. The Robosoft's (France) Kompaï robot is used in the project. Partners in Austria, Hungary and France completed an interview among the potential users and their caregivers about their opinion of the robot. This work describes the results of the interviews, the analysis and the main findings.

This document on the local implementation of the Domeo interviews in Austria, in Hungary and in France presents the summary of the methodology (see detailed description in Deliverable 1.1), the findings and observations of the Domeo project's interviews with end users, family carers and professional carers.

A common methodology for the user interviews to be performed in the Domeo project was laid down in the document "Interviews methodology report" that was prepared in Deliverable 1.1. This methodology was implemented in the local user interviews which were conducted on October 19, 2010 at a dementia daycare unit in Vienna, on November 10, 2010 in the National Institute for Medical Rehabilitation in Budapest and on April 6, 7 and 20, 2011 in an Alzheimer's disease nursing home in Pechbonnieu (Haute Garonne).

In this report, documented are the main methodological aspects, the steps taken to prepare the interviews, the recruitment of participants and the main findings and observations of the interviews.

About costs and funding: we indicate to a questionnaire, which we performed in Budapest at 2010 summer by questioning 120 persons when we also touched financial issues. See in details at section "8. Appendix".

This document is the second version of "Interview results report" and contains also the French results.

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1. Introduction

This document presents the methodology, results, and main findings and observations of the interviews with intended Domeo end users, family and professional carers. The interviews were conducted at the Integrative Geriatric Daycare Centre of the Caritas Socialis in Vienna on October 19, 2010, in the National Institute for Medical Rehabilitation in Budapest on November 10, 2010 and on April 6, 7 and 20, 2011 in an Alzheimer's disease nursing home in Pechbonnieu (Haute Garonne).

These interviews were targeted to investigate and explore the following issues related to the possible uptake and use of the Domeo system:

- acceptability and privacy
- pertinence of services
- costs and funding
- possible obstacles
- motivation level to use the proposed services
- organisational issues
- recommendations

Additionally, the interviewed people were encouraged to provide any ideas for the improvement of the Domeo prototype, including any new ideas what the system could offer its future users.

In order to assess acceptability and attempt and detect possible, user-driven improvements a focus-group method was introduced as a common method for all project partners.

The interviews took the following format:
Four potential user, their elder end younger caregivers were invited for an interview in all countries. A short presentation and a video were shown then about the objectives of the Domeo project. It was followed by a live demonstration about the Kompaï robot. Three focus groups were formed: potential users, elder caregivers, younger caregivers.

2. Preparation and implementation of the interviews

2.1. Conditions of the preparation

2.1.1. Austria

In order to ensure focus group interviews with the intended groups, TU Wien approached Caritas Socialis and its Integrative Geriatric Daycare Centre, a care organization specializing in supporting people with dementia and their families. Two experts, a manager and a researcher, with academic degrees in psychology and sociology, respectively, closely participated in planning of the interviews together with the TU Wien staff.

2.1.2. Hungary

The interviews were conducted in the National Institute for Medical Rehabilitation. The interviewer team consisted of three medical doctors, two physiotherapists, an informatician and an engineer.

2.1.3. France

The location of the interviews was at “Maison de Vie Marie-Louise” associative nursing home, Pechbonnieu (Haute Garonne). It's an Alzheimer’s disease nursing home and relieve centre hosting 60 permanent residents and day care patients.

2.2. Process of recruitment

2.2.1 Austria

The participants for the three focus group interviews were recruited from the pool of clients, i.e., persons with dementia, their family carers and professional carers who are regular visitors and users of services of the Integrative Geriatric Daycare Centre.

The initial contact with the clients and relatives was made by the manager of the Daycare Centre who approached them during their visits to the Centre. The manager also drafted a letter which was sent along with a brochure of the Domeo project to the recruited clients and their family carers. Similarly, the manager approached professional carers at the Daycare Centre.

For the clients of the Daycare Centre – persons with dementia – the following criteria of selection were used:

- age at least 60 years of age
- both women and men will be included (at least one of each)
- MMSE 21-24 (at least mild impairment)
- diagnosis can be any kind of mild dementia

The selection criteria of the caregivers and relatives were the following:

- age: for one minimum 65, for the other maximum 40
- both genders must be represented
- caregivers should meet the patient at least 3 times a week

An informed consent form was attached in the information letter that was sent to the recruited participants.

2.2.2. Hungary

The participants were selected from the patients of the hospital, the friends and the relatives of the workers of Domeo team.

The criteria of participating as a patient were:

- age at least 60
- both genders (at least one of each genders)
- MMSE 21-24
- diagnose can be any kind of mild dementia

The criteria of participating as a caregiver or a relative was:

- age: for the elder caregivers minimum 65, for the other younger caregivers maximum 55 years (at least for one caregiver under 40)
- both genders must be represented
- caregivers should meet the patient at least 3 times a week

2.2.3. France

The interviewers have selected triplets with one patient, one elderly caregiver and one young caregiver.

Criteria for selection of elderly patients:

- Alzheimer’s disease including mixed dementia and related syndromes
- 65+
- average MMSE over 15 (preferably 20)
- usually well awake in the morning
- used to watch the TV

Relative selection criteria:

- 65+
- no cognitive impairment
- visiting their patient at least 3 to 4 times a week (caregivers widowed to a patient were accepted)
- not used to have a nap after lunch

Professional caregivers selection criteria:

- average age 40, less than 60
- caring for an AD patient at least 3 to 4 times a week
- no cognitive impairment

2.3. About methodology: presentation, demonstration and documentation

A PPT presentation based on the common Domeo slides was prepared and a video was shown about the objectives of the Domeo project. It was followed by a live demonstration of the Kompaï robot (moving, speech recognition in English, internet facilities).

All participants gave their consent to an audio recording of the interviews.

2.4. Composition of focus groups

2.4.1. Austria

Group 1: The persons with dementia or the end users consisted of:

- two women, ages 83 and 85, with MMSE 26 and 27
- a man, age 81, MMSE 21
- visit the Daycare Centre 4 times, 2 times, 4 times respectively

Interviewer: Sabine Kloibmüller, psychologist, manager of the daycare centre
Observer/note taker: Paul Panek, researcher, Institute „integrated study“ Vienna University of Technology

Group 2: The family carers/relatives of persons with dementia, intermediate users, consisted of:

- two men (a spouse and son), one woman (spouse)
- all over 65 years of age

Interviewer: Sigrid Steiner, health psychologist, employee of the Daycare Centre
Observer/note taker: Peter Mayer, researcher, Institute „integrated study“ Vienna University of Technology

Group 3: Caregivers at the Integrative Daycare Centre

It was not possible to recruit male caregivers at the Integrative Daycare Centre. Caring for persons with dementia is predominantly in hands of female employees.

- The group consisted of three female employees, whose ages were 24, 38 and 39.

Interviewer: Marjo Rauhala
Observer/note taker: Georg Edelmayer, both researchers at the Institute “integrated study”, Vienna University of Technology

2.4.2. Hungary

A potential user, an older and a younger family member were invited from 4 families. Except for one younger all of them arrived and took part at the interviews.

Subjects were divided into three focus groups as potential users, healthy older family members and younger family members. They sat down in three separate rooms.

Group 1:
The group of the potential users consisted of three women ages 77, 78, 84 (their professions: statistical assistant, technician, teacher) and a man age 80 (his profession: engineer).

The interviews were conducted by Gábor Fazekas. The technical support were given by Györgyi Stefanik.

Group 2:
The group of the elder caregivers consisted of four woman ages 61, 62, 76 and 76 (professions: teacher, nurse, financial assistant, technician).

The interviews were conducted by Katalin Zsiga. The technical support were given by László Gelányi and András Tóth.

Group 3:
The group of the younger family member consisted of two women aged 19, 52 (professions: student and inner architect) and a man age 54 (his profession is car dealer).

The interviews were conducted by Orsolya Péter. The technical support were given by Tamás Pilissy.

Consents were signed by all participants (patients and caregivers). They can withdraw their consent at any time without further explanation.

2.4.3. France

Group 1: elderly patients with Alzheimer's Disease (AD)
Two men and two women, residents in Marie-Louise (82 average):

- man, 82, former baker, MMSE<5
- man, 82, in retraining in an agricultural setting, MMSE=10
- woman, 78, former nursing home auxiliary nurse, MMSE=13
- woman, 85, shoe shop saleswoman, MMSE=16

Group 2: elderly natural caregivers
One woman, three men (83 average). One had his wife at Marie-Louise, one's wife used to be in Marie-Louise but died, one lived at home with her Husband and one with his wife.

- man, retired gendarme

- man, retired automobile repair garage owner
- man, retired aerospace industry engineer
- woman, retired midwife and former head of school for midwifes

Group 3: young professional caregivers
Participants:

- one female registered nurse (57)
- two auxiliary nurses (one female 52, one male who didn’t want to give his age, under 30)
- one female entertainment personnel (53)

Involved research staff:

- responsible and focus-groups animator: Pierre Rumeau MD
- actors: Blandine Boudet MSci, Patrick Coquerel Eng, Mathieu Denis MSci
- technical support: Patrick Coquerel Eng, Mathieu Denis MSci, Marylène Lefevre ST, Guillaume Lepicard PhD cand, Frédéric Vella PhD, Nadine Vigouroux PhD
- data collection: Nadine Vigouroux PhD, Blandine Boudet MSci
- data analysis: Pierre Rumeau MD, Blandine Boudet MSci, Marylène Lefevre ST

Paramedical staff from the nursing home were present during the focus group with patients, to help avoid unnecessary stress to the patients or in case of trouble, but they did not need to intervene.

3. Analysis: main findings and observations by focus group

3.1. Overall impressions and general remarks

3.1.1. Group 1: Potential end users

3.1.1.1. Austria

The end users’ discussion group lasted significantly longer than the experts at the Caritas Socialis expected. The participants were able to participate actively in the discussion. They also provided concrete ideas for what the system could

do. Against prior expectations, this group displayed perhaps the most open and positive attitude toward the system.

The focus group interview with end users can be considered to have been successful. The participants displayed genuine interest in the presentation and demonstration of the Domeo project and the Kompaï. Additionally, the length of the participants' focus and concentration on the topic exceeded the expectations of the experts.

The users all said they had a good impression of the system following the presentation. None of them had ever seen anything like the Domeo system before.

> "*It makes a good impression. I thought (after the presentation) that it can do quite a lot. It could make me aware of all kinds of things. What I have forgotten to do, what I need in daily life. And this it could do.*"
>
> "*I guess one's steady companion should look a bit different... But we live very long and many things have changed.*"
>
> "*It looks handsome. Sweet-looking.*"

3.1.1.2. Hungary

All members of the group were very interested in the Kompaï robot, very important questions were asked during the presentation and the demonstration.

3.1.1.3. France

Two men and two women, residents in Marie-Louise (82 average) took part in the interview.
They appeared to be motivated during the presentation and focus groups but had some difficulties in connecting with the discussion.

Total duration of the interview was 1h 03min.

General feeling about the services are: no understandable spontaneous answer.

3.1.2. Group 2: Older family members

3.1.2.1 Austria

The focus group consisting of relatives and family carers displayed the most critical attitude. Their expectations of the Domeo system were high and the presentation and demonstration of the capacities of the system were somewhat disappointing.
The system was on one hand too simple, is able to do too little, to really provide relief for the family carers, or, too complicated, according to the relatives, for the end users to be able to use it.

The attitude of the relatives can be explained by two facts: on the one hand, this group is very well aware of the actual problems and limitations of the potential end users. On the other hand, the group composition turned out to be such that one of the participants was very familiar with computers (through his work) and another had recently discovered interest in personal computing. The views of this group were more critical and less optimistic with regard to any genuine relief that the Domeo system could offer either to them or to the family members they care for.

The major weakness perceived was the system's incapacity to really provide assistance or support, as in being able to bring or carry something the user needs. The Kompaï should be able to somehow manipulate something in order to be helpful.

> *"It would need to have functions related to transporting things; for example, "bring me some water". It should be able to somehow manipulate things. This is in my opinion a basic requirement."*
>
> *"I am sorry, but the mechanics are missing."*
>
> *"It has no arms."*
>
> *"My first thought was: for whom should this be of help, me or my spouse?"*

3.1.2.2. Hungary

During the interviews the participants showed many new aspects concerning the Domeo project. The general attitude about robots is that these can have a very useful role in healthcare but also the devices are still not advanced enough and some improvements needs to be done.

3.1.2.3. France

One woman, three men (83 average). One had his wife at Marie-Louise, one's

wife used to be in Marie-Louise but died, one lived at home with her Husband and one with his wife.

Total duration of the interview was 1h 45min.

The general feeling about the services is: all:

> *“Reactivity is failing, the robot is reacting too slowly.”; “It is needing too much time, this is an issue in an emergency situation.”*
>
> *“The voice of the robot is too deep, a more acute voice would be better.”; “I couldn’t hear what the robot was saying.”; “It may be difficult to catch... what the robot said.”*

3.1.3. Group 3: Younger caregivers

3.1.3.1. Austria

The professional carers displayed a curious and rather open attitude toward the possibility of using robotics in dementia care, both in private homes and in more institutional settings and provided many ideas of how to use the Domeo in the institutional setting. Each of the groups provided at least one idea on how to use the Domeo system in supporting dementia care. The Kompaï was perceived as a combination of a walking frame, a communication device, and a portable a computer, and (ideally) including some support for transporting things.

3.1.3.2. Hungary

In Hungary the younger caregivers displayed the most critical attitude and they gave the most constructive recommendations.

3.1.3.3. France

Total duration of the interview was 1h 10min.

General feelings about the service are:

> *“It could be improved.”*
>
> *“It is slow.”*
>
> *“Having to repeat the command is puzzling to the user: the patient may get lost during the process.”*

3.2. Acceptability and privacy

3.2.1. End users

3.2.1.1. Austria

Issues of acceptability and privacy were discussed in terms of confidentiality and briefly in terms of design aspects of the Kompaï. The users mentioned several times that the robot should not tell anyone else about the conversations that they might have. The robot should simply listen, take over the function of reminding, perhaps being a conversation partner and be discrete.

The size of the Kompaï was considered appropriate, the colours could include others than the current purple. The colour of the system, however, was not considered so important.

Confidentiality of the robot:
It was mentioned several times during the interview that the robot should keep confidentiality and not tell anyone else about the conversations that the user might have with it. This suggests that the users might perceive the robot a kind of companion with whom to share thoughts during the day. They did not want these thoughts to be heard by others. This also suggests that the interviewees may sometimes feel lonely. One user described her concerns regarding confidentiality as follows:

> "*The robot is not allowed to tell anyone what I have said to it because I might just want to pour my heart out to it.*"

The end users did not think that the robot could replace people. It was seen as an aid that could help and remind, even listen, and initiate some action, but not as a replacement to human contact and companionship. The robot was seen as limited or lacking in its capacities to feel, think, to be affectionate, and to adapt itself to new situations.

> "*No, it cannot talk with a person.*"
>
> "*You cannot give it a kiss and even if you could, it would not feel it.*"
>
> "*It cannot replace my spouse. But it could help my spouse.*"

3.2.1.2. Hungary

The opinion of the potential end users about the appearance of the robot was not so good:

> "*It should be more “elegant”, more humanoid.*"
>
> "*It’s speech is too official.*"
>
> "*It should have arms.*"

They gave different answers to the question if they would need such a robot.

> "*Yes.*"
>
> "*It would be useful on “bad” days.*"
>
> "*Not yet, but later it would be useful for me.*"
>
> "*I would consider it as a toy.*"

However most of them would use the robot at home with pleasure.
They didn't find any amazing or unexpected when seeing the robot.
They had some weird questions of the subjects:

> "*Has it any radiation?*"
>
> "*Has it an emotional centre?*"

All of them evaluated the presentation quite interesting.

3.2.1.3. France

> *“This is not fearsome.”; “Nowadays, one is seeing many machines.”*
>
> *“We are afraid we could not understand it.” “The voice of the robot is pleasant”.*

3.2.2. Elder carers

3.2.2.1. Austria

With regard to acceptability, the relatives mentioned the complexity of the user interface as a hurdle. The user interface was seen as too complex for the end users to handle. The participants thought that it could be useful if the robot could respond to some simple natural language commands, such as a cry for

help, however, they rejected this ideas as well because there are many other (less complicated and established) systems that can be used in this case. The human computer interaction in the case of a person with cognitive impairments was seen as complicated whether commands were to be given through the use of a touch screen or speech.

> *“I have great doubts that my mother [who has Alzheimer’s] is at all capable of touching the screen in the right place. It is too complicated. […] We already experience problems with a mobile phone. The use of an ordinary telephone is the limit of what we can ask of her.”*
>
> *“Using a touch screen is a problem for older persons. And not only for older persons, I know this from my own experience, even people still who are still working, for example, in a factory, have difficulties with touch screens. Because they point at the wrong thing.”*
>
> *“You cannot train a person with Alzheimer’s Disease to use standardized language.”*

The relatives could not imagine the Kompaï or its use in their households, nor could they think of anything that it could achieve that cannot be achieved with mobile phones or personal computers.

> *“You can make phone calls with your mobile phone. Conference calls are possible with the personal computer. You can do almost everything today without this robot.”*

The relatives did not perceive design aspects as critical when it came to the acceptance of the Kompaï.

> *“It looks funny, the robot. Yes, it is nice, a nice design, etc. But it cannot do enough.”*
>
> *“My first impression was: parking assistant, the sensors…”*
>
> *“It looks nice.”*
>
> *“To me it makes little difference how it looks.”*

The relatives were inconclusive with regard to the end users’ willingness to accept the Kompaï in their homes. On one hand, they expressed critical attitudes toward the robot as a kind of carer or companion by saying it is not human after all. The idea of a robot taking up human roles was not well received.

> *“It is not a human being; we do not even have to discuss this.”*

On the other hand, they thought that the users might well display a more accepting attitude toward a robot than to some people that come to their homes and assist them, such as cleaning ladies.

“It depends on the patients. They will probably say it cannot even shake your hand.”

“I think my mother would be more likely to accept a robot than a cleaning lady in her home. Cleaning ladies are chased out of the house or not let in in the first place..."

Opinions also differed with regard to what the needs and preferences of the end users are. While two relatives described “their” end users as needing much calmness or silence, one relative described the complete opposite, an end user who needs much activity to feel good. The Kompaï would need to address both groups.

3.2.2.2. Hungary

According to the impressions based on the presentation the robot is a great help for people living alone and their families.
However the robot has a strange, unusual look, it's inhuman.

“I don't like it. It's unnatural.”

“Funny.”

“It's unusual. It's shape has to be more human-like.”

“It's speech tone was very low and I'm not said to be deaf.”

When asking the members of the group about using the robot themselves or if they would recommend it to their relatives, they all replied positively with and addition that the robot needs some improvements and also physical assistance should be necessary when the robots are used. They also said if the robot would be improved and they were older people living alone, they would use it.

3.2.2.3. France

Privacy:

“No problem if voice only is transmitted, there would be a problem of respect to the individual if video was transmitted.”; “The video should be started by the patient apart from an alarm situation.”; “The operator should be adequate staff, with an ethical... approach, abiding to... medical secrecy.”

“The robot is complementing the caregiver but the caregiver should not be bypassed.”; “The caregiver should agree with the provision of the robot; the robot should not be imposed, the patient should ask for the robot.”; “The caregiver should be allowed to cancel the transmission by the robot trough

a voice code or start it when he requires to."; "The person helped, when alone, should have no liberty… to stop the robot… as he could not restart it."

"The caregiver should not abandon the helped person due to the presence of the of the robot."

Fear of the robot: three:

"No, but the patient could be afraid."; "Myself, I feel overcome."; "My wife didn't understand anything with or without robot."; "It is a mater of use, surprise may occur at the start but then there is no problem."

Impact on daily life:

"A problem with stairs and curtains."; "It would not change anything at daily life."; "It could help daily life, if the caregiver is absent at the time of a fall as an example, it me give a bit of safety."; "There could be difficulties if the patients is used to the caregiver, if the caregiver is away, there could be a divide: the patient is used to call the caregiver and not the robot."; "I can not leave my wife alone at the time with a robot, it's just a robot."

3.2.3. Younger carers

3.2.3.1. Austria

- Privacy and risk of reduced contact

Implementation of the system in a private home of a person with dementia, especially if the system were to include a possibility of surveillance, was found problematic if the person could not make decisions for themselves any longer. The risk of collected data landing in wrong hands was also mentioned.

The camera function was found problematic – not only because of privacy-related reasons – both in the private home and at the Centre. At the Centre the caregivers would not want to be monitored themselves all the time. In the private home the possibility that technology could be used to reduce actual care was to be taken seriously. It would not be acceptable for the caregivers to use the Domeo system to reduce visits of care personnel and their time spent with persons with dementia. A video contact cannot replace real social contact.

"How long can a person stay sane without skin contact? If no one shakes your hand, no one touches you, if you don't feel another person's skin… How long can you take it?"

- Design: recognition as robot important

For the professional carers the major ethical issue in introducing robots to the care setting dealt with the risk of the end users mistaking the robot for being human. For this reason, the caregivers preferred a design for Kompaï that clearly signals its being a machine. Despite the preference for a machine-like design, the interviewees mentioned that the Kompaï could be given a mouth.

> *“These things will one day look like people but I believe it is wrong. There must be a clearly perceivable difference between a human being and a machine. Otherwise it is deception, deceiving that a machine is a human being.“*

When asked about the limits of how far a robot could imitate a human being, facial expressions (mimic) was mentioned as being too much. The caregivers found it misleading to have humanoid robots with facial expression without emotions. This would probably cause abnormal behaviour in people.

> *“I find facial expressions [in robots] spooky.”*
>
> *“A machine that looks human, has facial expressions but no feelings probably triggers something because [human beings] act with emotion. If you never get any emotional response in return, I believe that will trigger abnormal behaviour in people.”*

Concerns were additionally voiced with regard to the fact that a robot could be scary for an older person with dementia.

> *“If I had dementia and such a robot would suddenly come to me, I would probably be scared. If I could not assess it any longer, because of my dementia...”*

Related to acceptability, the Kompaï’s being able to move about in homes of the end users was important. They were wondering if the Kompaï’s the engine would be powerful enough to get over thresholds and roll over carpets and rugs.

3.2.3.2. Hungary

They accepted the robot's appearance.

> "*I like it. The only question is if it’s necessary to have the robot a human shape?*"
>
> "*It does not disturb me, for me it’s kind.*"

They found the robot's speech well understandable.

> "*Yes.*"

"*Absolutely.*"

"*Totally good.*"

They were satisfied how the robot executed the instructions.

"*A little bit slow, but it made the tasks in a good beat.*"

"*It is not necessary to be faster, an aged man generally slower.*"

"*He executed it normally.*"

If they have a chance they would you use a robot like this.

"*If I would be alone, and I would be aged, may be then.*"

"*Yes, mainly because of the contact keeping.*"

3.2.3.3. France

“The voice is too sharp, a deeper less aggressive voice would be better.”

“Messages are correctly understandable.”

“Voice communication is very important.” “There is seemingly no other communication media.”

“The person or caregiver should keep some control.”

“There is no ethical problem in case of an answer to a telealarm or if the user himself is asking… the connection.”

Impact on the daily arrangements:

“It’s a good tool, reassuring and most useful in the relationship between the caregiver and the helped person” but “it should not be a replacement for the helper.” “It is a spare help to the caregivers and an addition.”

Would you like to have that robot: all:

“Why not” but “there is an understanding problem, patients, due to their generation, could be afraid, it’s complicated, a demonstration would be very useful as the robot is an abstraction to them.”

3.3. Pertinence of services

3.3.1. End users

3.3.1.1. Austria

The most important services or functions were considered:

- reminder function
- companion, someone to talk to (someone who can keep confidentiality)
- emergency situations
- shopping list

3.3.1.2. Hungary

The most useful functions of the robot are:

- connection to family members
- emergency call

3.3.1.3. France

About use perception:

> *“I want to have something left to do. One has to retain her autonomy for as long as possible.”*

Use of the robot in case of an accident:

> *“I’d like it to help me.”; “I have to admit I don’t know, there are limits, occasionally the robot doesn’t answer completely, it is peculiar.”*

About relevance of services:

> *“We would not have anything left to do, we have to keep our autonomy as much as we can.”*

Alarm:

> *“The robot doesn’t answer completely.”*

Congenial videoconferencing: two “yes”, one “no”.

Interest of a transmission logbook on the robot:

“I don’t think so.”

3.3.2. Elder carers

3.3.2.1. Austria

The shopping list was not considered so useful by the family carers; one interviewee mentioned it could be possibly useful for her (but not for her husband). For the end users themselves, the focus group appeared to agree that it would not be of help any longer.

Services that relatives considered pertinent included:

- reminder function, especially about need to take medication
- entertainment (films, music)
- transport function
- carrying some objects along all the time
- emergency call (being able to recognize when the end user needs help and calling for help)

- Reminding about medication

A major issue for the relatives is the end users’ medication and reminding about it. They would be grateful for a solution that works in this area. The solution would need to be able to check whether the user has really taken the medicine. Reminding itself is not sufficient as relatives reported that the end users often react to their providing reminders over the phone by replying that they are now taking the medicine, but only going through the motions (including imitating the situation of taking the medicine, taking a glass of water, making sounds as if swallowing the pills).

- Entertainment

In addition to reminding functions, the system could provide some entertainment (music, films). The system could actively suggest some entertainment for the end users in the opinion of the relatives.

- Transporting and carrying things

The robot should be able to transport things (bring them to the user, and return them to their place) and keep some useful and often needed objects along all the time (shoehorn, tissues).

- Emergencies: calling for help

Furthermore, the system should be able to recognize when the end user no

longer reacts to it, or needs help, and be able to actively call for help. Here the relatives mentioned that the system should be smart enough to recognize the difference between sleeping and being unconscious.

- Monitoring

Two interview partners mentioned they could benefit from being able to spend some time alone during the day. If the system could monitor in a reliable way it could be useful. The end users mentioned they are now the ones who perform monitoring.

3.3.2.2. Hungary

- emergency call system
- efficient verbal communication
- good obstacle detection system
- reminding of daily tasks like taking a medicine, measuring the blood sugar, it remembers a shopping lists, appointments etc.
- video-phone system

3.3.2.3. France

About use perception:
Command confirmation:

> *“It may help some individual but puzzle others.”; “No problem.”; “It needs to be part of a dialogue.”; “One has to be able to say yes or no, it is difficult.”*

Voice control:

> *“The voice command is interesting but Alzheimer’s persons are not always able to think on what they want to do, to act in voice spontaneously.”*

Would there be a threshold in the disease:

> *“There could be difficulties, no patient will behave the same as the next one, when I’m talking to patients they never do answer.”; “They may understand and not answer and the other way round.”*
>
> *“If the robot is just transmitting from the patient to his correspondent, there is no need for a robot. I can not see the point of the robot if it is only transmitting.”; “The robot could be a more realistic presence to the patient.”*
>
> *“The robot should be rigged with an independent failure detection device.”; “The user should know there is a failure with the robot.”*

“The robot could have an other use: guide the user inside the home.”; “A same word may have different meanings for the patient, the robot may fail understanding what the patient is wanting... The voice processing should adapt to the individual.”

About relevance of services:
Alarm: two “Yes” and one “No”.

“Relevant if the robot may detect falls by itself and the person doesn’t need to call the robot; the patient can not call the robot.”

Congenial videoconferencing:

“It’s depending on the stage of the patient, it could help the patient or the caregiver.”; “It’s more important for the caregiver.”; “I’m overcome by all I can see.”; “It is important to remotely assess the disease at a distance, if a physician has a look at the patient, it’s important, he can give an advice.”; “An Alzheimer’s person can not stay home alone.”; “My wife can not walk, I’m doing what I can, but the robot could not help.”

Interest of a transmission logbook on the robot: all: “Yes.”

3.3.3. Younger carers

3.3.3.1. Austria

A reminder function was considered very important especially in the case of using the system at home. Caregivers mentioned the following areas where reminding is useful:

- taking medication, especially in the evenings
- taking the correct amount of medication;
- drinking adequate amounts
- remembering to eat
- wearing adequate clothing (for the weather and temperature; changing house shoes into street shoes when going out)
- taking along a bag, keys, glasses before leaving house
- informing about a delay in the transport (taxi to Centre)

The Domeo system could be an improvement to the existing communication.

The shopping list function could be useful. A caregiver could respond sooner to the needs of the end user. Currently users make lists to the carers to take along. Whatever needs to be bought will be brought at the next visit. This takes planning and time.

It would be helpful if the system could be connected to a physician so that receiving prescriptions at home became possible. It would mean an improvement to the users who have regular medication and who now need to get their prescriptions renewed in person every month.

3.3.3.2. Hungary

The strengths of the robot are:

- the modern communicational function
- speech recognition

3.3.3.3. France

About use perception:

> *“Emergency call center to the operator is a priority.”*
>
> *“Helping with ordering home delivery of goods, contacting a shop, the nurse, the pharmacy.”; “It is a link with the outside.”; “Having drugs delivered at home.”*
>
> *“It should be considered that the robot should detect that the person is not answering in the morning, detecting a problem by itself… the robot… would be better.”; “A daily call by the call centre operator to the frail person to check every thing is all right.”*

About relevance of services:
Alarm: all:

> *“Relevant.”*

Congenial videoconferencing: all:

> *“Interesting to get in contact with his family.”*
>
> *“We can trust the robot but it is a machine and may happen to be out of order.”*

Interest of a transmission logbook on the robot: all:

> *“Yes, remote access for the medical and paramedical staff according to the law on telemedicine but through a secure connection.”*

3.4. Costs and funding

3.4.1. End users

3.4.1.1. Austria

The question about costs was made by the end users right at the beginning of the interview. It is apparently a very important topic. However, as there was no concrete information with regard to the costs or financing of the future Domeo system, the interview team agreed ahead of time to bracket this particular point and keep it limited in the discussion.

3.4.1.2. Hungary

We didn't have precise information about the robot's costs when making the interview, so we didn't talk about that.
It's important to mention that it would have a big impact if the purchase of the robot would be supported by the healthcare insurance.
We indicate to a questionnaire, which we performed in Budapest at 2010 summer by questioning 120 persons when we also touched financial issues. See in detail at "8. Appendix".

3.4.1.3. France

> *“It depends, there should be a service, according to the service we could see who would have to fund.”*

3.4.2. Elder carers

3.4.2.1. Austria

Many of the suggestions that the relatives made to improve the system were blocked by an immediate concern that this would be likely to increase the costs of development and the subsequent system. This implies that costs are a very important factor for the relatives.

3.4.2.2. Hungary

We didn't have precise information about the robot's costs when making the interview, so we didn't talk about that.

3.4.2.3. France

> *“I could not pay.”; “I would advice… A subscription: some would answer 50 € a month and others 1.000 € a month, but the service has to be efficient.”; “The user has to pay.”; “Part should be paid by the user and part by the social security.”; “Alarm and videoconferencing are as much of a priority for Alzheimer’s people.”*

3.4.3. Younger carers

3.4.3.1. Austria

Costs and funding were an issue raised by the caregivers without prompting. They reminded the interviewers of the fact that many of their clients live off modest pensions.

3.4.3.2. Hungary

We didn't have precise information about the robot's costs when making the interview, so we didn't talk about that.

3.4.3.3. France

No spontaneous proposition.
Family, social security, mutual insurance…: all:

> *“All three, as a subscription, no more than 50€ a month to be paid by the patient, for teleassistance and loss of autonomy.”; “Target the needs of the individual.”*

3.5. Possible obstacles

3.5.1. End users

3.5.1.1. Austria

One of the users mentions being technically so untalented that someone else would need to enter any data to such a system.

Despite the fact that the overall impression seemed rather positive, it is necessary to pay careful attention to the typical ways that new technologies are turned down – especially by older users. In other studies, we have encountered the comment "useful but not for me" as a kind of polite rejection of a system. One interviewee said:

> "*I would not need it at the moment. I am old but I still feel pretty good. But I could need it one day.*"

3.5.1.2. Hungary

The opinion of the potential end users about the appearance of the robot was not so good.

3.5.1.3. France

> *“We are afraid we could not understand it”, “The voice of the robot is pleasant.”*

Use of the robot in case of an accident:

> *“I have to admit I don’t know, there are limits, occasionally the robot doesn’t answer completely, it is peculiar.”*

Alarm:

> *“The robot doesn’t answer completely.”*

3.5.2. Elder carers

3.5.2.1. Austria

The robot would fail in typical council apartments because it would not be able to get over the thresholds.

The relatives could not think of ways the robot could really assist their family members or themselves in basic needs. They considered the needs of the end users such that they could not be solved with the help of information technology.

The arms of the Kompaï would help in transporting things.

Relatives doubted that the Domeo could be used for a longer period of time by a person with dementia. As the cognitive impairment increases the persons with dementia will be less able to communicate with the systems.

3.5.2.2. Hungary

The robot's weaknesses are:

- Communicating with the robot can be done only from a short distance, it's hard to understand the robot's words
- It's unable to provide physical assistance for disabled old person

> *“If it isn't able to do anything why should I send it anywhere?”*

- It's only able to communicate verbally so emergency will be triggered only if the patient is able to speak
- If the patient hits the robot or falls on it, it doesn't go away
- Although older people don't feel alone in the presence of the robot, it's inanimate and can't reflect emotions

3.5.2.3. France

> *“Reactivity is failing, the robot is reacting too slowly.”; “It is needing too much time, this is an issue in an emergency situation.”*

The elder carers has no fear of the robot, but in their opinion the patient could be afraid.

About the impact on daily life: it can be a problem with stairs and curtains.

3.5.3. Younger carers

3.5.3.1. Austria

The caregivers found it misleading to have humanoid robots with facial expression without emotions.
That a robot could be scary for an older person with dementia.

- Carrying function necessary

The caregivers pointed out to a shortcoming similar to the family carers that in their opinion was obvious. The Kompaï would need a tray or basket so that it could carry some small things, for example, a cup of coffee. Without the carrying function the Kompaï was perceived of as having limited use and benefit.

> *“Otherwise the users might as well take their walking frames and mobile phones...”*

3.5.3.2. Hungary

The weaknesses of the robot are:

- it’s not able to go upstairs
- it's not able to go over a doorstep
- it must be placed in a clean environment
- it can't speak and understand Hungarian
- understanding the spoken word is difficult

3.5.3.3. France

Obstacles to usability:

> *“Every thing should be level... in the place of living, problems with bugs.”*

Acceptance obstacles:

> *“Fear of the complexity and the abstraction of the robot.”*

3.6. Level of motivation to use the proposed services

3.6.1. End users

3.6.1.1. Austria

The users displayed a rather optimistic attitude toward the use of the system. None of them had previous experiences in computer use but all appeared to think that the use of the Domeo system would be something they could manage.
To the interviewer‘s question whether the users think they could use the system, all answered in the affirmative.

> "*I think I would still manage using it.*"
>
> "*Yes. Offhand.*"
>
> *Interviewer:* "*You are not afraid of technology?*"
>
> "*No.*"
>
> "*I would trust myself…*"

3.6.1.2. Hungary

They found the most useful functions of the robot:

- connection to family members
- emergency call

3.6.1.3. France

Motivation to learn use:

> *“It would be a better frightening at the start but one should try.”; “Yes, I would, if there is a service.”; “No, I’m not ready at the present, I’d rather keep my autonomy.”; “No, it is not possible for us, I haven’t got a big house.”*

Usefulness for the family:

> *“Definitely.”; “I guess, yes.”; “Yes to help me.”*

3.6.2. Elder carers

3.6.2.1. Austria

Relatives displayed overall a skeptical attitude toward the benefits of the proposed system and services. Many obstacles would need to be cleared in order to motivate relatives to adopt the system for the persons they care for. Some of the obstacles include the failure of the presented prototype to convince the family carers that the services can be useful and provide the relatives some genuine relief in their care burden.

Relatives have rather high expectations of the technical support that could provide them and their relatives assistance. Some of the interviewees considered themselves irreplaceable as care providers.

> "*I can only say that I am the best robot, I am the best and irreplaceable.*"
>
> *“I simply cannot see how you could use it so that it would provide real help.”*
>
> *“It would need to be able to do much more than this [what was presented].”*

It is also apparent that relatives need reassurance that any new technology in their home would not end up creating an extra work load for them. One of the family carers expressed her concerns regarding the requirements and expectations placed by Domeo on the care person. This family carer did not feel technically competent in using this kind of a system. Using the system would mean an additional burden for the particular interview partner. She also doubted the system would provide any benefit for her husband, or, that it would interest him.

> *“Because I have to say, I have enough work. I work more now than when I was still employed, I have to say, or that is how I feel. I have also aged. Now that I have seen it, I think it is too technical. I have limited technical skills. I look up on my mobile phone and my computer that which I need. Whenever I cannot do something, I ask my daughter to take care of whatever it is that does not work. I don’t want too much of it because I am happy that I can manage what I can.”*
>
> *“It might just bring more work than benefit.”*

3.6.2.2. Hungary

The robot's strengths are:

- In case of an emergency the robot alerts the appropriate person
- The robot has efficient verbal communication skills and has a good obstacle detection system

- Reduces the feeling of loneliness of older people by communicating with them

“This is an enormous help for people who live alone.”

”The old person is under non-stop observation.”

- Reminds of daily tasks like taking a medicine, measuring the blood sugar, it remembers a shopping lists, appointments etc.
- With its video-phone system it can maintain a connection between the relatives and the doctor

“It's a very good thing that the patient can make a connection anytime between the doctor or the relatives.”

3.6.2.3. France

Use of services: two “Yes”, one “No”, one:

“Why not, if the robot is adapted to the individual and efficient.”

Motivation to learn use:

“The robot is in the same state as the Alzheimer’s individual.”; “One should have the possibility to chose the words, the adapted vocabulary to the individual.”

Motivation to use the robot for oneself: two “yes”, one “No”, one “Why not”.

Motivation to use the robot for a close relative: one “Yes”, one “I would try”, one “Why not”, one “No”.

“Games are not useful.”

3.6.3. Younger carers

3.6.3.1. Austria

The Kompaï’s being able to move about in homes of the end users was important.

The Kompaï would need a tray or basket so that it could carry some small

things, for example, a cup of coffee.

The caregivers mentioned that the cognitive training program that is in use at the Centre could be integrated into the Domeo system. Because the Kompaï is mobile it could bring the training program to the end users and clients, wherever they happen to feel comfortable at the moment. This would allow for more flexibility in the use of the Centre’s premises than is currently the case.

3.6.3.2. Hungary

The most useful functions of the robot are:

- it is a big help for persons who cannot use modern devices
- it detects if the old person fell down in the bathroom

> "*Mainly for those who cannot use the modern devices (computer). For example, I like that it can inform those people who the patient wants to with modern devices (it can send an e-mail, what the aged man would not be able to make automatically).*"
>
> "*In my opinion the most important function of the robot is that it should notice if somebody fell over in the bathroom. Or you can tell the robot that you are having a bath now and inform somebody if you don’t come out in half an hour.*"
>
> "*I consider it’s good. But it’s necessary to give the older people more help in their weekdays. The alarm function is a good idea.*"

In the future they would able to image their relative's life with a robot like this.

> "*Yes, if there is no other way.*"

3.6.3.3. France

Motivation to use the proposed services: all: “Yes.”

Motivation to use the proposed services for a close relative: all: “Yes.”

Motivation to learn use: all:

> *“Yes.”; “Training is compulsory.”*

Training related difficulties:

> *“For us, not necessarily.”; “More complicated for elderly people.”*

Robot as fun: all: “Yes.”

3.7. Organisational issues

3.7.1. End users

3.7.1.1. Austria

- Other users

The end users were of the opinion that the system should be able to recognize other legitimate users besides themselves. They might not know at some point how to use the system and therefore someone else should be able to use it as well. This could be a family carer, for example, but "no stranger".

> "*I am alone and I would use it alone. But I also have a nephew who lives in the same building, and the system should also recognize his commands. He could program what the system should tell me, something I might not be able to do myself. It should accept a second person.*"

- Places of use

Besides finding the Domeo system suited for the private home, the users found it could be useful in care facilities. The Daycare Centre, for example, was considered an excellent place of use for the Domeo system. The end users thought the robot could for example guide one to the toilet.
Only physical obstacles mentioned by the end users with regard to use of the system in the private home. These include rugs, carpeting, doors, thresholds in the home. Additionally, it was discussed whether the floor plan of the home would be suited for the robot. It was also mentioned that narrow doorways and glass doors might be a problem for the robot. All users agreed that they had enough space for the robot to move about in their homes.

3.7.1.2. Hungary

The appearance of the robot must be made more acceptable for older people.

The speech recognition and speaking abilities must allow the following:

- tell the patient where he/she has taken his/her belongings in the house
- ask if the medicine was taken
- read books, newspapers etc.
- dictate letters, memoir etc.

3.7.1.3. France

The end users were afraid they could not understand it.
Some of them want to retain their autonomy for as long as possible.
They found the robot a bit frightening, but some of them didn't refuse trying the robot in the future.

3.7.2. Elder carers

3.7.2.1. Austria

The family carers were of the opinion that the robot would fail in typical council apartments simply because it would not be able to get over the thresholds.

The concern was voiced that the system would be unable to provide relief to caregivers as an Alzheimer's patient cannot be left alone at all.

> *"Unfortunately we are… my husband cannot spend a minute alone."*
>
> *"You cannot leave an Alzheimer's patient alone for one moment. […] Monitoring might be good. Because that is what I do…"*

3.7.2.2. Hungary

The house should be prepared for the robot (thresholds, doors), the robot can't move between levels and it isn't able to fit or move to small spaces (eg. bathroom).

> *"The place must be suitable for robot movement. What does it do if there is a threshold?"*
>
> *"But without tresholds the flat is windy."*
>
> *"It can't even open a door."*
>
> *"Even the places are too small for it to turn around."*

3.7.2.3. France

> *"Reactivity is failing, the robot is reacting too slowly."; "It is needing too much time, this is an issue in an emergency situation."*

About privacy:

“No problem if voice only is transmitted, there would be a problem of respect to the individual if video was transmitted.”; “The video should be started by the patient apart from an alarm situation.”; “The operator should be adequate staff, with an ethical approach, abiding to medical secrecy.”

“The robot is complementing the caregiver but the caregiver should not be bypassed.”; “The caregiver should agree with the provision of the robot; the robot should not be imposed, the patient should ask for the robot.”; “The caregiver should be allowed to cancel the transmission by the robot trough a voice code or start it when he requires to.”

3.7.3. Younger carers

3.7.3.1. Austria

The caregivers made suggestions to how the Domeo system could be helpful in their own care organisation. They displayed an open and interested attitude toward implementing a kind of mobile computer to their daily work. It was assessed as contributing to efficiency especially in the documentation processes. This way the caregivers estimated they could often save up to an hour per day of time that could be better used in the actual care of their clients.

3.7.3.2. Hungary

According to the communicational capabilities:

- it must speak and understand Hungarian language
- the speaking must be well understandable and louder

The house and the robot's environment must be clean and prepared for the robot's movement.

3.7.3.3. France

Obstacles to usability:

“Every thing should be level… in the place of living, problems with bugs.”

3.8. Recommendations

3.8.1. End users

3.8.1.1. Austria

Potential end users' ideas about the uses of Domeo:
The end users provided some concrete examples of how the Kompaï could assist them in their daily living. While the robot was seen as being incapable of replacing human beings, it was assigned the roles of compensating (memory), encouraging or initiating activities, and guiding physically a person from one place to another. It could also act as a friendly wake-up call every day at the same time. The following ideas were introduced and discussed by the interviewees.

- Reminder and compensation for memory

At least one user mentioned that she had difficulty keeping in mind all the things she needs to do. She copes by writing things down. A robot could compensate memory loss, for example, when it comes to remembering appointments, reminding about different needs, making aware of things that may have been forgotten, and even initiate some activities. The robot was also seen useful in providing answers to questions.

- Reminding about appointments

The users discussed the reminder function of the robot in the following way:
Not only should the robot remind about an appointment but it should tell the user what to take along, like the social security card to a doctor’s appointment.
When reminding about an appointment the system should do so early enough so that there is time to prepare, to eat and to use the toilet, for example. The reminder should be given about 1-2 hours in advance. Not only was a reminder about appointments outside of the home considered important:

> "*The robot could remind about the fact that home-help will be arriving soon, so that I will open the door for her and not leave home.*"

- Reminding about different needs

The users perceived the Domeo system as being able to remind them about different needs. Examples mentioned were reminding about the regular use of the toilet; medication; and the need to check regularly that there is enough food at home.
Additionally, the Domeo system could simply make a user aware of something he/she may have forgotten and give an overview of the daily program.

- Encouraging and prompting activities

The end users were curious to find out whether the Domeo system could actively initiate some activities on its own. Apparently the end users would accept the robot prompting or encouraging some activities. In the words of one interview partner:

> "*It could say something, couldn't it? It could tell me that we need to go shopping, or, that we need to go out, for a walk or whatever. Could it do that?*"

Furthermore, the robot could address the users by asking them questions such as:

> "*What would you like to do now? What could I do?*"

- Noting things down

The robot should be able to keep track of things that the user should be able to remember and provide that information when asked for.

> *Interviewer: "Do I understand you correctly when you say that the robot could make a note about what you say to it?"*
>
> "*Yes. Yes. Yes. It will make a note. In a way that you can read it later. Oh, oh, that I forgot. That I have forgotten yet. This is something I need to do yet. And so on.*"

- Having someone to talk to

At least for one end user the Domeo system could function as a kind of companion who would listen to her. But in this case, the system should be trustworthy and display confidentiality and not „tell" anyone about the conversations that may have taken place. For this interview partner having someone to talk to would be important, she mentions living alone, and loneliness, and the need to have someone to talk to.

> "*I would like to say that it should say nothing to anyone else. It has to stick to it and not tell anyone about anything that has been said. "Interviewer: „Perhaps you would like to say more to a robot?"*
>
> "*Maybe. Yes. And maybe I will be pouring it my heart out.*"
>
> *Interviewer: "Really? You would like to have it as someone to talk to?*"
>
> "*Yes, something like that. Because I live alone. I used to live with my family. But they are now all dead, and the others have moved out. And I am alone. Especially when you are old you could really use someone.*"

- Domeo in emergencies

Telephoning through the Domeo system was considered useful especially in case of emergencies or in relaying information. As concrete situations where Domeo could be helpful the following were mentioned: a Domeo user cannot

get out of bed in the morning, or has fallen, and needs help. The system could then call somebody, such as a relative. Or, a user cannot participate in the activities of the Daycare Centre and s/he could use the system to easily cancel participation and the ride to the centre.

- Providing answers

The robot could provide answers to users' questions. To the user's question "What have I forgotten?", the robot could give a reply in writing, for example. This suggestion came from a potential end user who said she needs to write down a lot of things to remind her of daily tasks.

- Wake-up function

The users thought the robot could have a wake up function so that they would be woken up at the same time every day.

> "*The robot could wake me up in the morning; say good morning, it is time to get up.*"
>
> "*It could also play music, from an opera or operetta. No hot rhythms. I don't like them. I am too old for that.*"

3.8.1.2. Hungary

Some other thing would be useful besides the present functions of the robot:

- telling the patient where he/she has taken things in the house
- bring to him/her objects, drinks etc. from other parts of the house
- expression of emotions, e.g. encouragement, stimulation, sympathy, compassion
- asking if the medicine was taken
- paying check
- reading books, newspapers etc.
- helping to step in the bathtub
- supporting to stand up
- opportunity to dictate letters, memoir etc.

One of them would suggest the robot for persons who cannot move.

3.8.1.3. France

Use of the robot in case of an accident:

> *"I'd like it to help me."*

3.8.2. Elder carers

3.8.2.1. Austria

The interviewed relatives could only see a very limited use for and limited benefit of the Domeo system. They even recognized risks in increased burden for themselves.

For family carers, the relief to their care burden that a technological system could provide is of central importance. Problematically, the interview partners could not think of anything that their family members could do with the system while they themselves were out of the house.

> *“I tried to imagine this thing is in our home. It would be interesting to know what my wife would do with it if I were out of the house for a couple of hours. Nothing. It will stand in the corner and do nothing.”*

Instead, the interview partners could imagine the robot helping persons without cognitive impairments but who are immobile.

The relatives could not think of ways the robot could really assist their family members or themselves in basic needs. Part of the problem is that they considered the needs of the end users such that they could not be solved with the help of information technology and the tasks that they themselves do as representing a vast spectrum.

> *“The basic needs of older people or disabled people include things like: ‘tie my shoe laces.’ The robot will never be able to do it. This is something that will not be achieved even by the next ten robot generations. Or, ‘give that thing from up there!’, or, ‘put this thing over there!’ But these are the things that a patient needs. The weather report in Paris is relatively uninteresting; [the patient] won’t need it. But he can look it up if he is mentally up to it. All these PC solutions can be too much and be all too confusing for a patient.“*
>
> *“This [system] is of no help for persons with dementia or for their relatives. This is because the spectrum of caring is so wide. The robot cannot even cover 1% of the work that a care person performs.“*
>
> *“My husband does not use a computer at all. And he has no interest in it. He likes to play with the heating and I have to keep on checking on it… He does not know what he is doing; he only turns things around…”*

- Addressing real issues of persons with dementia

The relatives presume that the use will be too complicated for the persons with dementia. The use may be possible provided that the system is limited to a few functions only. All items of the display would need to be.
The areas where the end users need, according to the relatives, genuine help, support, and assistance are the kind where the relatives saw little hope for the

Kompaï to accomplish anything. The support needed is the kind where information technology cannot provide solutions. For example, one interviewee mentioned putting on shoes as a real problem where an assistive device is helpful.

> *“I will now say something funny... A long shoehorn that my husband has. With its help he can still put on his shoes on himself, I don’t have be there. [The robot] cannot do it.”*

Throughout the interview, the missing arms of the Kompaï resurface. This would help in transporting things. It is also suggested that the robot could keep some commonly used objects available inside it behind a door. A shoehorn was mentioned. The prerequisite is that the robot could demand the objects to be put back in place after use; otherwise they could be misplaced.

- Cleaning of the toilet

There are burdens that the relatives would like to be relieved of. One interview partner mentioned the burden of cleaning the toilet as an important issue that would require attention. Not only is there reoccurring physical work related to this problem, but it is also an emotional burden to the family carers.

> *”This is a great problem for Alzheimer’s patients. I was told no one will relieve me of this burden. I presume the robot will not do it either. This is the greatest and most unpleasant issue...a bad problem; because one gets appalled over and over thinking this person was... Cleaning the toilet is certainly... Whether the robot would do it...*"

3.8.2.2. Hungary

- The house should be prepared for the robot (thresholds, doors), the robot can't move between levels and it isn't able to fit or move to small spaces (e.g. bathroom).
- To give instructions to the robot, the speak has to start with the word „robot”, this would be better with a human name.

> *“It's very useful but it has to be improved.”*
>
> *”It should be able to carry objects, elevate when it's needed to cross a threshold or open a door.”*

3.8.2.3. France

> *“The robot is complementing the caregiver but the caregiver should not be bypassed.”; “The caregiver should agree with the provision of the robot; the robot should not be imposed, the patient should ask for the robot.”; “The*

caregiver should be allowed to cancel the transmission by the robot trough a voice code or start it when he requires to."

"It could help daily life, if the caregiver is absent at the time of a fall as an example, it me give a bit of safety."

3.8.3. Younger carers

3.8.3.1. Austria

The caregivers mentioned that the cognitive training program that is in use at the Centre could be integrated into the Domeo system. Because the Kompaï is mobile it could bring the training program to the end users and clients, wherever they happen to feel comfortable at the moment. This would allow for more flexibility in the use of the Centre's premises than is currently the case.

- Entertainment

The caregivers saw potential in Kompaï's ability to play some music and show films to the end users. Additionally, it could be a combination of a mobile library, collection of games, and cognitive training program.

- Use in the institutional care settings

The caregivers suggested that a mobile robot with speech recognition features could support the daily administrative and documentation work of caregivers at the Centre. As a concrete example, the documentation of the blood pressure measurement or filling out the daily reports could be dictated to the Kompaï, or, it could be asked to bring medication. According to the interviewees, documentation of measurements and fetching medication tend to be time-consuming activities which take up time spent in actual care. The caregivers estimate that they spend up to an hour each day filling out forms and reports. They imagine that mobile robots could assist in documentation and carrying in use at their Centre.

"Mrs. Soandso, record blood pressure of soandso, or filling out the care report… that would be great. This would save us a lot of time."

"We would experience less stress and we would have more time for our clients."

- Domeo in the private home

In the private home, the caregivers believe the Domeo system should be able to support housekeeping and be able to carry and bring small things to the user. Jokingly the caregivers said the system should be equipped with a vacuum cleaner. It could either measure the air quality, or even have an integrated humidifier. If the system could measure the oxygen level it could

also remind about the need to air. Some environmental control functions would be helpful, for example, opening the windows and the door, and switching on/off the lights on command. It could also provide a visual image of a person standing behind the house door when the door bell rings.

Furthermore the caregivers found it useful that the Kompaï could assist the user in standing up. A grab bar could be installed. Additionally the Kompaï could assist the user in doing walking and standing-up exercises.

The Kompaï should carry along important things (medication) and it should be able to come to the user on command.

Additionally, the Kompaï should be equipped with a holder for a cane and a hook for the hand bag.

3.8.3.2. Hungary

Some other functions that would be useful:

- carrying objects
- telling the patient when he injected the insulin, and checking if the person did not forget to inject it
- reading loud a book
- checking if the patient has turned off the gas
- sensoring carbon-monoxide and smoke
- checking all persons who are coming to the house (e.g. postman, relative or unknown person) and contacting the police if there is an unwanted person in the house
- managing the household machines
- recording everything that happens in the house

3.8.3.3. France

> *“A touch screen would be more handy than a keypad, visual symbols would be more useful than voice messages... or both depending on the individual.”*

4. Summary of the results

4.1. Austria

With regard to the observations of the interview with potential end users, a few remarks are necessary. For instance, the rather positive and open attitude toward the presented system in this group is noteworthy. Not only did the interviewees in the group of the end users appear curious and open to the technology but they also could imagine uses, including uses other than those presented, for the Domeo system. For this group early signs of memory-related problems are an important topic which explains the group's preoccupation on reminder functions. They also suggested a wake-up function and thought they could use the robot as someone to talk to. It is also of interest that at least one interviewee in the end user focus group used the pronoun "we" in one situation when talking about herself and how the robot could be helpful for her. This remark along with the idea that the robot could act as a listener to the users suggests that the end users (or at least one of them) perceived the Kompaï as something a bit more than a mere machine.

The attitude of the family caregivers or relatives group was the most critical of and least open to the potential of the Kompaï and the Domeo system of the three focus groups. The interviewees perceived themselves to be irreplaceable in the care relationship and considered the potential of the Domeo system very limited. The critical attitude was strengthened by the fact that the relatives saw the system's use as too complicated for the persons they cared for. They were also disappointed at the capacities of the system itself, calling it a mere computer on wheels that was useless unless it could carry and bring something on command.

Interestingly, even functions that made good sense to the end users were found uninteresting or not useful by the relatives. The shopping list which the end users found useful, in combination with a reminder function, was not of interest to the family carers.

> *"I think a shopping list is completely useless."*
>
> *"It is not needed; the [end users] don't even go shopping any longer."*
>
> *"The robot will not even be able to find out what we need in the first place. …to save all that on a PC and then retrieve the information again… I don't know. It can do a lot, but it needs arms."*

The family carers made a strict difference between humans and machines in supporting activities of daily life of the persons they care for. Family carers

considered themselves practically irreplaceable and found it difficult to find any areas of daily life where the Domeo system could be of help. They were especially critical with regard to the idea that the end user and the Kompaï could somehow be talking with each other. Surprisingly the end users who were interviewed considered the Kompaï having more potential for being a kind of companion and even someone who could listen to them. They also had expectations with regard to rules in the interaction with the Kompaï; they mentioned the Kompaï should be able to respect confidentiality.

As the relatives will be in a key position to decide whether a system like Domeo will be taken up in the household of a person with dementia, it is very important to carefully chart and investigate their main concerns. The fact that family carers are often overburdened as it is, the system should not cause any additional work for them.

In the focus group of the caregivers interesting uses for the Domeo system were introduced and discussed. These included making use of a kind of mobile computer as part of the documentation of care and in care provision itself. Concerns were raised especially with regard to the risk of reduced human contact, or the possibility that a humanoid robot could be mistaken for a human being.

Caregivers could see many uses for the robot also in the private home. Various reminder functions, the shopping list, and a connection to the physician were mentioned.

The caregivers' suggestions and concerns spring from their everyday experiences with the intended end users and are therefore a valuable source for further investigation. Also the possibility for institutional use of Domeo supporting the caregivers themselves should be investigated.

4.2. Hungary

We found some similarities and also some differences between the final opinion of the three groups. Although all three group had similar opinion about the need of technological advancement, the different generations had different aspects.

The end users group found the robot's appearance unnatural and inhuman, although most of them would use the robot at home with pleasure. They said the most useful function is that it's able to make connection to family members and make emergency calls whenever needed, which is a very easing function.
Some other things would be useful besides the present functions of the robot, which are not available recently, but could relieve the patient's life, e.g. telling the patient where he/she has taken things in the house; bring to him/her objects, drinks etc. from other parts of the house; asking if the medicine was

taken; paying a check; reading books, newspapers etc.; help steping in the bathtub; supporting to stand up; opportunity to dictate letters etc.
They would like mainly a partner to reduce their feeling of loneliness, to have someone to talk to, to have somebody who reads books or newspapers, who plays the desired music etc. Therefore they were a bit disappointed because the robot wasn't able to express emotions.

On the contrary the main aspect of the older caregivers was that they wanted a device which is safe and reliable, can give support and initiate an alarm in case of an emergency.
The general attitude about robots is that they can have a very useful role in healthcare but are also devices which are still not advanced enough and some improvements needed to be done.
The main strengths of the robot: the ability to make emergeny calls, the verbal communication skills, the reminder functions, the good obstacle detection and easy connection with video-phone between the patient and his/her relatives or between the patient and the doctor. The main weaknesses are the strange looks of the robot, the hardly understandable speech, the inability to provide physical assistance, the movement problems, the inanimate gestures and inability to express emotions.
When asking the older family members about using the robot themselves or if they would recommend it to their relatives, they all replied positively with an addition that the robot needs some improvements and also physical assistance should be necessary when the robots are used.

In Hungary the younger caregivers displayed the most critical attitude. Unlike the two old groups, the younger caregivers had no objections against the robot's appearance and its speech.
They found the robot's communication skills and speech recognition excellent.
The robot also has a lot of weaknesses, e.g.: it’s not able to go upstairs; it's not able to go over a doorstep; it must be placed in a clean environment. The robot has a lot of useful functions, e.g.: it is a big help for persons who cannot use modern devices; it detects if the old person fell down in the bathroom. They told some other functions that would be useful: carrying objects; checking if the patient has turned off the gas; sensoring carbon-monoxide and smoke; checking all persons who are coming to the house (e.g. postman, relative or unknown person) and contacting the police if there is an unwanted person in the house; managing the household machines; recording everything that happens in the house.

Every group said they would not exclude such devices from their life, but all of them added that we have to widen the abilities of the robot and develop some available functions to be more precise, safe and reliable.

4.3. France

It was easier to recruit patients and professional caregivers than it was to recruit elderly natural caregivers.

Professional caregivers represented a good panel of the different professions involved in caring for Alzheimer's patients and an expected sex-ratio. Their perception could be biased by their activity in a nursing home and not in the community but some had a previous experience and reaching community staff would have been much more difficult from a focus group organisation point of view (availability time slots). Nevertheless, they had a good experience of AD. They appeared slightly older than expected with an average age closer to 45 or 50 than to 40, this is reflecting the average age of the caring staff in the nursing homes in cities in France (scarcely a first appointment).

Patients were on average of a more severe state than expected. This is because we had to rely on the physician and psychologist of the nursing for recruitments, and some of the MMSE were not updated regularly since admission. Those patients had an experience of home living with AD but their disease stage has limited their ability to interact, yet those information they gave proved most useful, probably due to their go level of commitment to the presentations and discussion.

The age of the patients is slightly lower than that of the natural caregivers, both being in their eighties (which is relevant to the epidemiology in Southern France). That slight difference may be explained by the sex-ratio and the fact one of the caregivers was widowed. We still remain in the same age class with a same expected attitude to technology.

Both patients and natural caregivers were representing a wide span of socio-educational levels. In one natural caregiver, there appeared to be some level of limitation of understanding and a difficulty to take part in the discussion therefore affecting the possibility to reach a consensus, he still could provide some valuable comments.

We consider that, although we had to adapt our panels for feasibility and we had to adapt the focus group methodology to special needs population, our panels gave a fair representation of the perception of Kompaï robot as developed in Domeo project by the home-dwelling AD patients, their natural and professional caregivers.

As compared to the focus groups held in Austria and Hungary, the use of live demonstrations seems to have had an effect on expectations. A stronger emphasis was put by participants on practical issues such as understanding the voice, the speed of operation, reliability of services… We had very little if any comment on the aspect of the robot. Companioning functions such as games or even the weather forecast (that was demonstrated as part of 1st scenario)

were not stressed by the focus group participants, games were denied usefulness.

4.4. General remarks

The opinions of the focus groups were summarized. The following were mentioned as the main advantages: the robot is a great help for people living alone, it connects family members, communicates verbally, recognizes speech, it is capable of video-communication, it can make emergency calls, reminds the user of the daily tasks (e.g.: taking medication) and reduces the feeling of loneliness. The negative things about the robot are: it's inhuman, the house must be prepared for the robot, the robot can't move between levels in the house, the robot is unable to provide physical assistance, the use of the robot seems to be too complicated for persons with dementia. The most important recommendations are: the robot should be able to carry objects, give physical support, read books and newspapers, provide cognitive training, clean the bathroom, remind the user where he has left something in the house.

In all countries the potential end users thought that the robot is an interesting tool but in general they didn't see the oppurtunity in the device. They need primarily a partner to have someone to talk to, to entertain themselves.

On the contrary the older carers would have been more calm if they knew their older relative is under constant surveillance in his own home 24 hours a day. Although their opinion about the robot was that it's too simple to successfully perform its assigned tasks. In Austria they were very disappointed because they thought themselves as not replaceable and the robot's potentials are very limited, and it cannot help in basic needs, some of its functions are unnecessary. In France the older carers also said that it can't change everyday life, they don't trust it. Nevertheless, in Hungary the participants were not so skeptical, they could see the opportunity in the device but thought some functions should be improved or implemented.

There were some differences even between the countries, e.g.: the appearance of the robot in Austria was found to be appropriate, while the Hungarian old people would like to see a more humanoid shape. In France people didn't found it to be frightening.
In Hungary the younger caregivers displayed the most critical attitude whereas in Austria and in France it was the older family members. The younger caregivers gave the most constructive recommendations.

The robot has to be a real partner for the old persons to reduce his/her loneliness, to maintain his/her cognitive functions and also has to be a reliable supervision to alarm in any case of emergency.

5. Conclusion

5.1. Austria

This report describes the procedure adopted for the Domeo focus group interviews in Vienna, the results of the interviews, the analysis, and the main findings. The results of the users interviews have been analysed to obtain information acceptability and privacy, pertinence of services, costs and funding, possible obstacles, motivation level to use the proposed services, organisational issues.

5.1.1. End users and Domeo

Summarized below are the main findings and observations of the focus group interview with end users:

- The end users displayed a more open attitude toward the use of a robotic system at home than was expected prior to the interviews
- The end users were able to point out to three different functions that they would find interesting for themselves
- These functions included: a wake-up function in the morning, with a greeting and/or music
- Different reminder functions, including reminders about appointments and what it needs to prepare for them, reminding about a need to go shopping
- Using the Kompaï as someone to talk to
- The end users furthermore placed the moral expectation of confidentiality on the Kompaï as a conversation partners – it should not pass on the conversations to anyone else
- Design aspects were not very important for the users, the robot could come in different colours, but that is not a prerequisite for use
- The end users estimated their own skills (as persons having no previous experience in computing) as sufficient for operating the Kompaï
- End users considered it important that the system would recognize another legitimate user, for example a family carer, who could operate the system (as well)

5.1.2. Elder carers and Domeo

The focus group with relatives displayed many critical observations and an overall critical attitude toward the presented system.

Summarized below are the main findings and observations from the focus group with relatives:

- The relatives were skeptical of the Kompaï's capacity to address real needs of the family carers or the end users
- The relatives cannot really see how the system could provide them any genuine relief
- Relatives would need assistance in areas such as cleaning the toilet, providing relief during the day so that they could spend some time themselves
- Relatives perceived more deficits than strengths in the current prototype and spent much time pondering what the system could do for their family members
- Concerns were expressed that the system might cause more work for the carers that provide relief for them
- Especially useful would be a reminder function especially for medication
- Entertainment (films, music) was considered a possibility to some users
- Transport function was seen as an absolute necessity, the missing "arms" were frequently referred to as a deficit
- The system should be able to carrying some objects along all the time; these include small frequently needed things such as shoehorns and tissues
- The system should be able to recognize an emergency and initiate such a call

5.1.3. Younger carers and Domeo

In the focus group with professional carers both critical and positive views were expressed as a reaction to the Domeo presentation. Uses were imagined for the home as well as institutional settings.

- Various reminders were consider very important, these included
- Taking medication, especially in the evenings
- Taking the correct amount of medication
- Drinking adequate amounts
- Remembering to eat
- Wearing adequate clothing (for the weather and temperature; changing house shoes into street shoes when going out)
- Taking along a bag, keys, glasses before leaving house

- Informing about a delay in the transport (taxi to Centre)
- The shopping list function was considered useful; currently users' needs can be reacted to only with a delay
- The Domeo system could be connected to a physician so that receiving prescriptions at home would be possible. This would mean an improvement to the users who have regular medication and who now need to get their prescriptions renewed in person every month
- The Kompaï should be equipped with a carrying function, a tray, or basked, and it should have a hook or holder for a cane and a hand bag

The caregivers were concerned about the robot being developed into a humanoid which could be mistaken for human. This would be morally inacceptable.
They were also concerned about the risk of patients being subject to more remote monitoring and less human contact through the implementation of a new system in the home. This would be inacceptable as well.

5.2. Hungary

5.2.1. End users and Domeo

- The opinion of the potential end users about the appearance of the robot was not so good.
- They gave different answers to the question if they would need such a robot. However most of them would use the robot at home with pleasure.
- The most useful functions of the robot are: connection to family members and emergency call.
- Some other thing would be useful besides the present functions of the robot: telling the patient where he/she has taken things in the house; bring to him/her objects, drinks etc. from other parts of the house; expression of emotions, e.g. encouragement, stimulation, sympathy, compassion; asking if the medicine was taken; paying check; reading books, newspapers etc.; helping to step in the bathtub; supporting to stand up; opportunity to dictate letters, memoir etc.

5.2.2. Elder carers and Domeo

General aspects: the general attitude about robots is that these can have a very useful role in healthcare but also the devices are still not advanced enough and some improvements needs to be done.

The robot's strengths:

- It's a great help for people living alone and their families
- In case of an emergency the robot alerts the appropriate person
- The robot has efficient verbal communication skills and has a good obstacle detection system
- Reduces the feeling of loneliness of older people by communicating with them
- Reminds of daily tasks like taking a medicine, measuring the blood sugar, it remembers a shopping lists, appointments etc.
- With its video-phone system it can maintain a connection between the relatives and the doctor

The robot's weaknesses:

- The robot has a strange, unusual look, it's inhuman
- Communicating with the robot can be done only from a short distance, it's hard to understand the robot's words
- It's unable to provide physical assistance for disabled old person
- The house should be prepared for the robot (thresholds, doors), the robot can't move between levels and it isn't able to fit or move to small spaces (e.g. bathroom)
- It's only able to communicate verbally so emergency will be triggered only if the patient is able to speak
- If the patient hits the robot or falls on it, it doesn't go away
- To give instructions to the robot, the speak has to start with the word „robot”, this would be better with a human name
- Although older people don't feel alone in the presence of the robot, it's inanimate and can't reflect emotions

When asking the members of the group about using the robot themselves or if they would recommend it to their relatives, they all replied positively with and addition that the robot needs some improvements and also physical assistance should be necessary when the robots are used. They also said if the robot would be improved and they were older people living alone, they would use it.

5.2.3. Younger carers and Domeo

- In Hungary the younger caregivers displayed the most critical attitude and they gave the most constructive recommendations.
- They accepted the robot's appearance.
- They found the robot's speech well understandable.
- They were satisfied how the robot executed the instructions.
- If they have a chance they would you use a robot like this.
- The strengths of the robot are: the modern communicational function and speech recognition.

- The weaknesses of the robot are: it’s not able to go upstairs; it's not able to go over a doorstep; it must be placed in a clean environment; it can't speak and understand Hungarian; understanding the spoken word is difficult.
- The most useful functions of the robot are: it is a big help for persons who cannot use modern devices; it detects if the old person fell down in the bathroom; In the future they would able to image their relative's life with a robot like this.
- Some other functions that would be useful: carrying objects; telling the patient when he injected the insulin, and checking if the person did not forget to inject it; reading loud a book; checking if the patient has turned off the gas; sensoring carbon-monoxide and smoke; checking all persons who are coming to the house (e.g. postman, relative or unknown person) and contacting the police if there is an unwanted person in the house; managing the household machines; recording everything that happens in the house.

5.3. France

Fear or privacy are not overwhelming issues in the prospect end-users decision to use or by a Kompaï robot and the related services. Providing reliably a relevant service to the special needs of the end and intermediate users is first and foremost. The economic model will derive from the service model. Retail selling the robot without the related services is not an option to the participants.

5.3.1. End users and Domeo

- The group didn’t feel the robot was fearsome.
- The robot is perceived by all as a new technology with a level of complexity. A training is needed to use the robot and some in the elderly groups are not feeling ready to take it.
- The elderly caregivers group stress the need for the voice control to adapt to individual users and to the evolution of the disease.
- There is a global feeling that the voice is not very well coping with the user’s special needs. Although the four patients could understand it, one feared he could miss some words. Understanding the voice and it being pleasant intermingled in the dissatisfaction of both the elderly groups; some further research and testing is needed to answer that requirement.
- The patients didn’t care about the entertaining applications on the robot.
- Both caregivers and patients have to agree in deploying the robot and related service.
- The group of patients didn’t see the electronic transmission logbook

needed.

- There was an agreement that the patient should pay some of the costs, the rest being funded by the social security and mutual insurance. Yet some still feared they could not afford it.

5.3.2. Elder carers and Domeo

- The group didn’t feel the robot was fearsome.
- The group of elder caregivers expected some fear from the patients but it didn’t prove in the discussions.
- The robot is too slow for the group of elder caregivers denoting a connectivity defect but also the reaction mode; reacting speed should be improved.
- There is a global feeling that the voice is not very well coping with the user’s special needs. One elderly caregiver didn’t understand what the robot was saying some of the time. Understanding the voice and it being pleasant intermingled in the dissatisfaction of both the elderly groups; some further research and testing is needed to answer that requirement.
- The elderly caregivers considered having games on the robot was no point.
- The natural caregivers’ group proposed that the robot could be leading the patient in his home according to where the patient wants to go.
- The elder caregiver group think that in case of alarm there is no ethical problem in the robot providing the operator a vision on the patient’s condition and surroundings.
- The operator should have a training to answer special needs of the patient, be available to the natural caregiver, abide to a deontology code and the rules for medical data secrecy.
- The natural caregivers asked to have the possibility to shut down the videoconferencing access to the operator. Yet the natural caregivers also proposed that the robot could detect falls by itself without the patient having to call it, this could have had to do with the push button telealarm possible failure to detect falls as they had experienced it.
- Both caregivers and patients have to agree in deploying the robot and related service.
- The natural caregivers group stressed the need for the robot to have an independent system to inform the users in case of failure.
- The videoconferencing was considered of some use by the majority. The natural caregivers would see it of more use for them than for the patient himself. Generally, the participants are cautious on the use of videoconferencing apart from alarm and rescue.
- Apart from the group of patients who didn’t see the need, the other groups agreed when asked whether the electronic transmission logbook could be of use, the professional caregivers asked for a remote access for

medical and paramedical staff, provided it respected the regulations on telemedicine and medical data transmission security.

- The members of the group agreed when asked whether the electronic transmission logbook could be of use.
- The natural caregivers stated that 50 or 1.000€ a month is acceptable depending on the service provided.
- The natural caregivers (who actually are to pay) were of a mitigate opinion about using the robot; some would not use the device, others would consider using it. We could put that “expectant” position in perspective with the requirement for a relevant service when asked to pay.

5.3.3. Younger carers and Domeo

- The group didn’t feel the robot was fearsome.
- The group of younger caregivers expected some fear from the patients but it didn’t prove in the discussions.
- The robot is too slow for the group of younger caregivers denoting a connectivity defect but also the reaction mode; reacting speed should be improved.
- The professional caregivers stress a risk that there could be a de-synchronization if the patient is answering a question while the robot is still trying to answer the previous command causing the discussion to overlap.
- There is a global feeling that the voice is not very well coping with the user’s special needs.
- In the professional caregivers group, the touch screen was considered to be potentially easier to use, with proper icons, than the voice command.
- The professional caregivers considered that the robot could be an entertainment by itself but they didn’t consider having games to play on it.
- The younger caregiver group think that in case of alarm there is no ethical problem in the robot providing the operator a vision on the patient’s condition and surroundings.
- The professional caregivers group proposed there could be a daily contact coming from the call centre to have a discussion with the patient and check he is all right.
- Both caregivers and patients have to agree in deploying the robot and related service.
- The videoconferencing was considered of some use by the majority. The professional caregivers were seeing it as a way for the patient of keeping in touch with his family. For the professional caregivers it could also be a way to contact retailers or pharmacist and as for home-delivery of goods. Generally, the participants are cautious on the use of videoconferencing

apart from alarm and rescue.

- The members of the group agreed when asked whether the electronic transmission logbook could be of use, the professional caregivers asked for a remote access for medical and paramedical staff, provided it respected the regulations on telemedicine and medical data transmission security.
- The professional caregivers proposed a subscription costing 50€ a month.
- The professional caregivers appeared to be motivated about using the robot.

5.4. Thoghts

According to all groups the Kompaï robot has the potential to be useful for older people. However, all groups voiced some criticism. Many of the recommendations can be taken into consideration during the development, but some of them are not realistic at present (e.g.: “the robot should tell me where I put things”).

6. Photos

6.1. Austria

6.2. Hungary

6.3. France

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8. Appendix

To measure the possible expectations a preliminary questionnaire survey was conducted before the interviews and the arrival of the robot. The questionnaire was filled out by the following three groups: patients (over sixty years of age, suffered a musculo-skeletal injury and participating in a rehabilitation program), relatives and health-care workers (proficient in rehabilitation).

In the study from all three groups 40-40 people were involved, totally 120 persons were asked.

All of them had to answer 18 questions or had to choose one from the given options. In general the following questions were asked:

- Can they imagine a robot to help the older people?
- In which areas could the robot be useful?
- Economical questions

The main ages were the following:

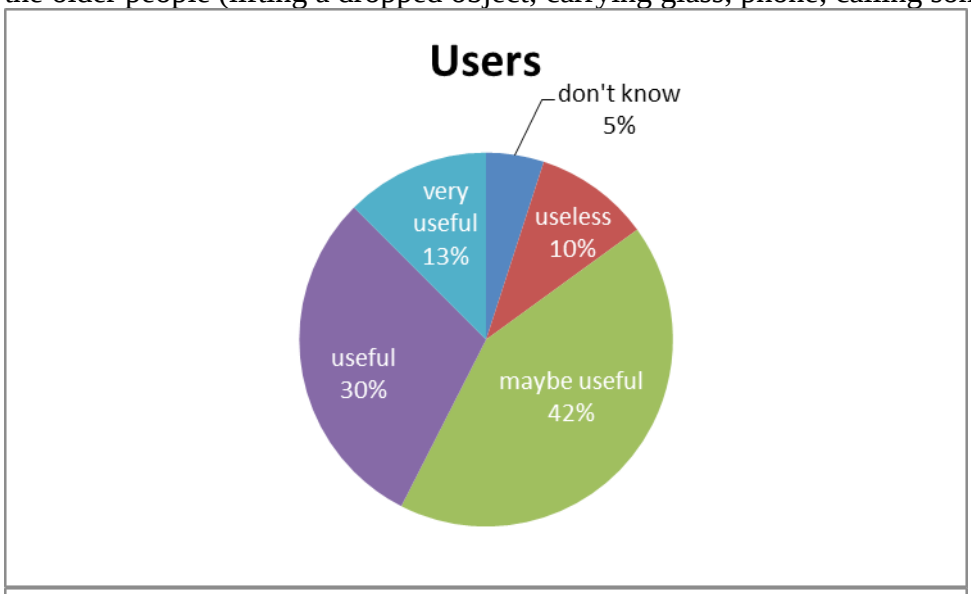
- patients: 74,5 years
- relatives: 50,4 years
- health workers: 38,3 years

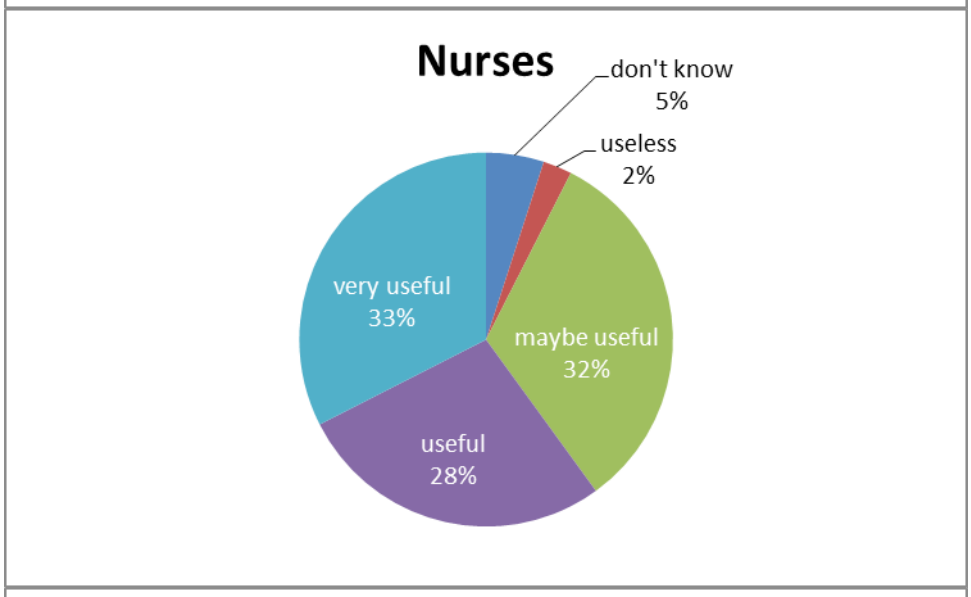
Most of the questions were related to the usefulness of the robots. As expected the younger ages (relatives, health workers) thought the robot more useful. But a large number of the patients (between 60 to 70 percent concerning the various issues) also believe that an assistive robot could be helpful.

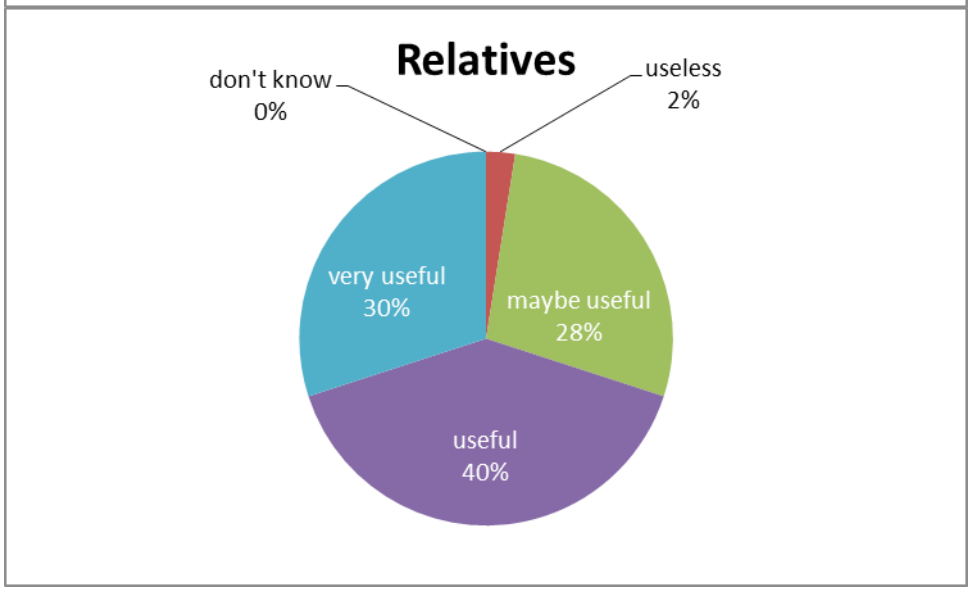
Only quarter of the people (and 4 of the patients) can imagine more than 500.000 HUF (1EUR = 275 HUF) for the potential price of the robot. For possible monthly rental fee only 4 patients, 10 nurses and 16 relatives can imagine more than 7000 HUF. This suggests that the potential home buyers want to pay much less than the actual price of the robot. However, 10 percent of patients and 25 percent of relatives gave the highest price range in the questionnaire.

In the following figures a few answer is highlighted:

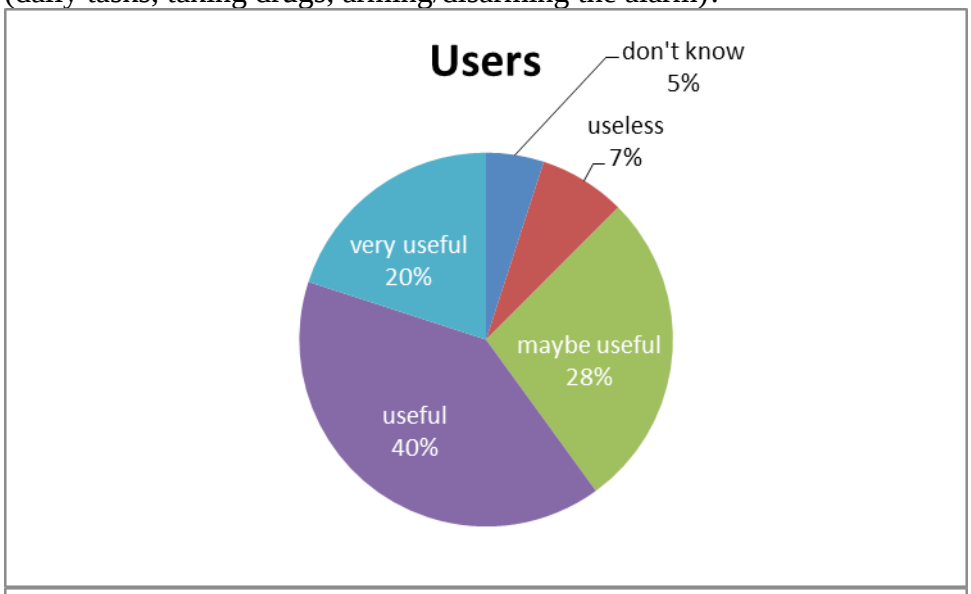
4. What is your opinion of a device/robot which does smaller tasks by voice instructions instead of the older people (lifting a dropped object; carrying glass, phone; calling somebody)?

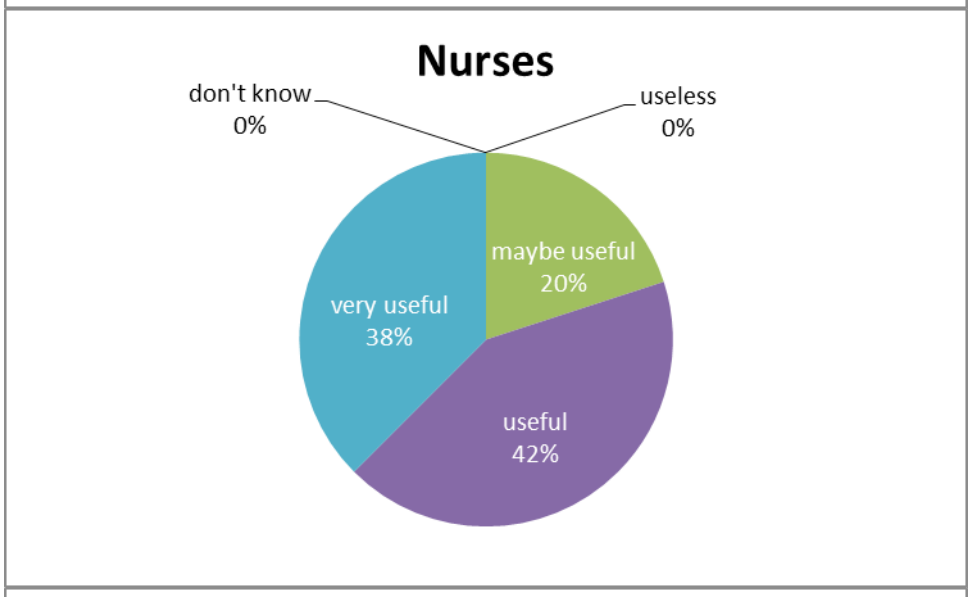


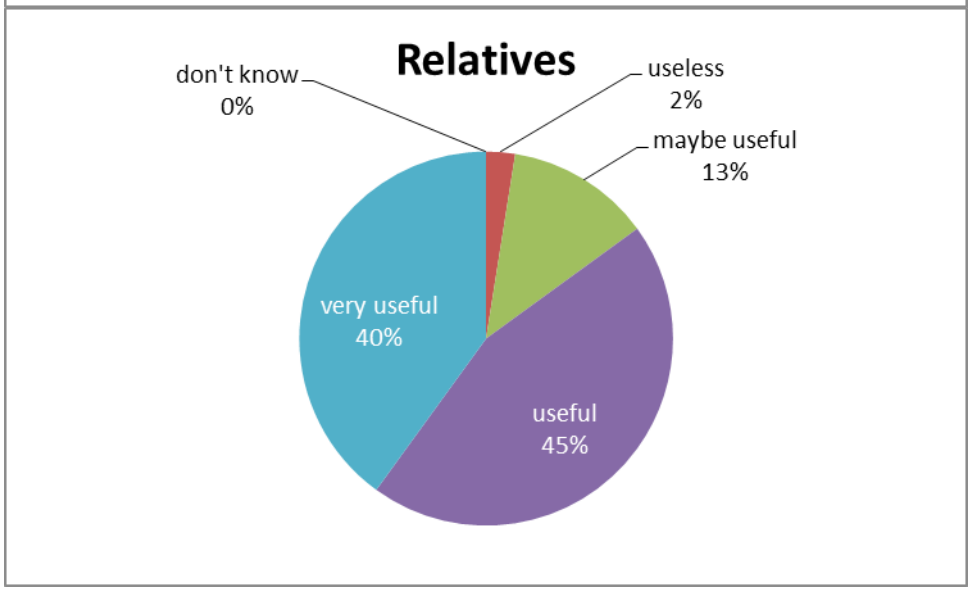




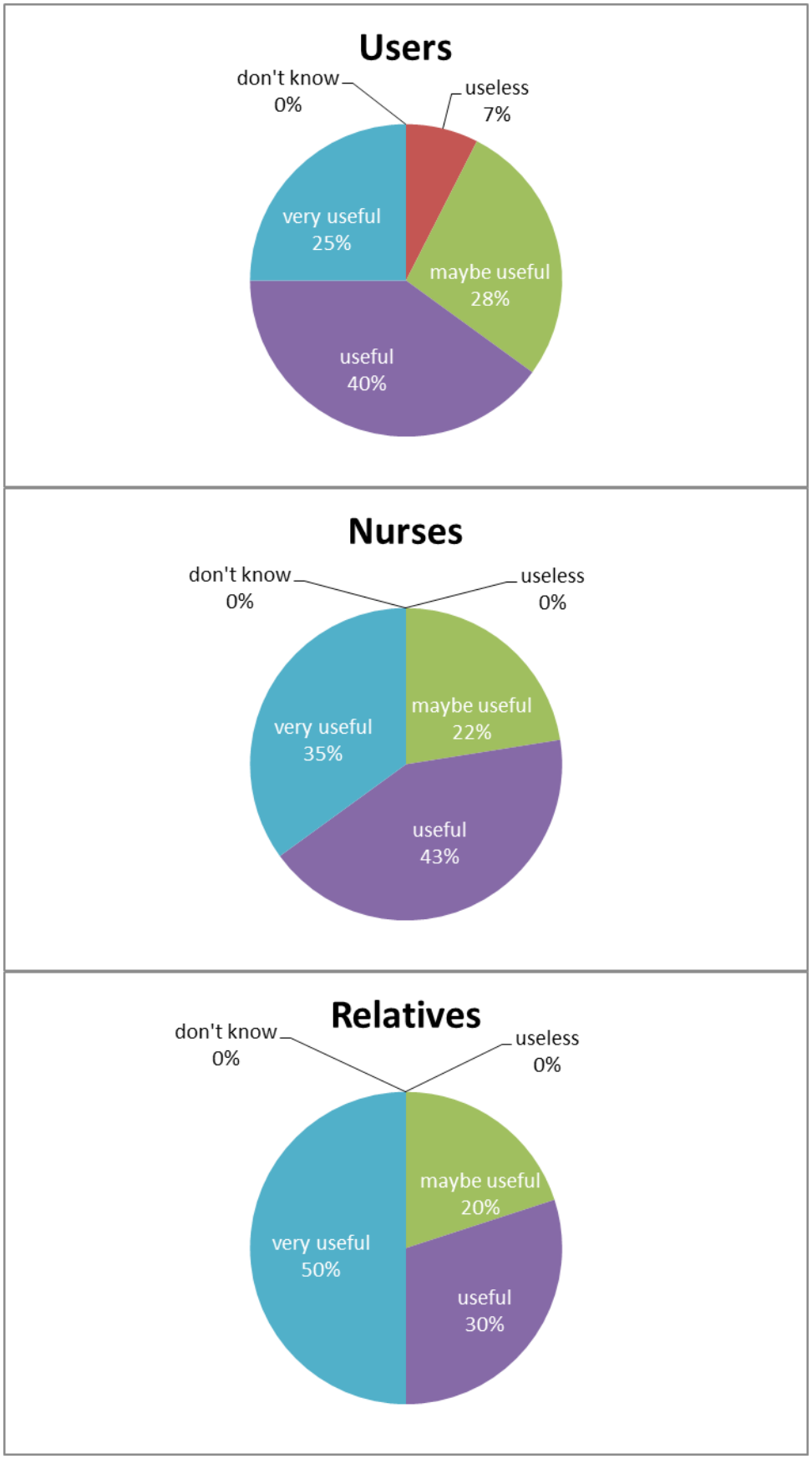
6. What is your opinion of such a device/robot which can remind the older people to their tasks (daily tasks, taking drugs, arming/disarming the alarm)?



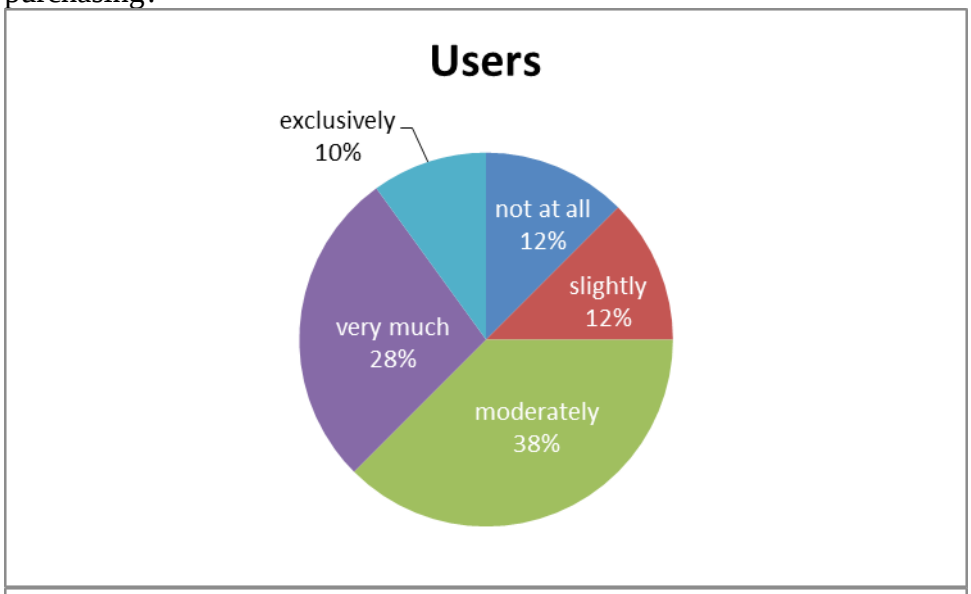


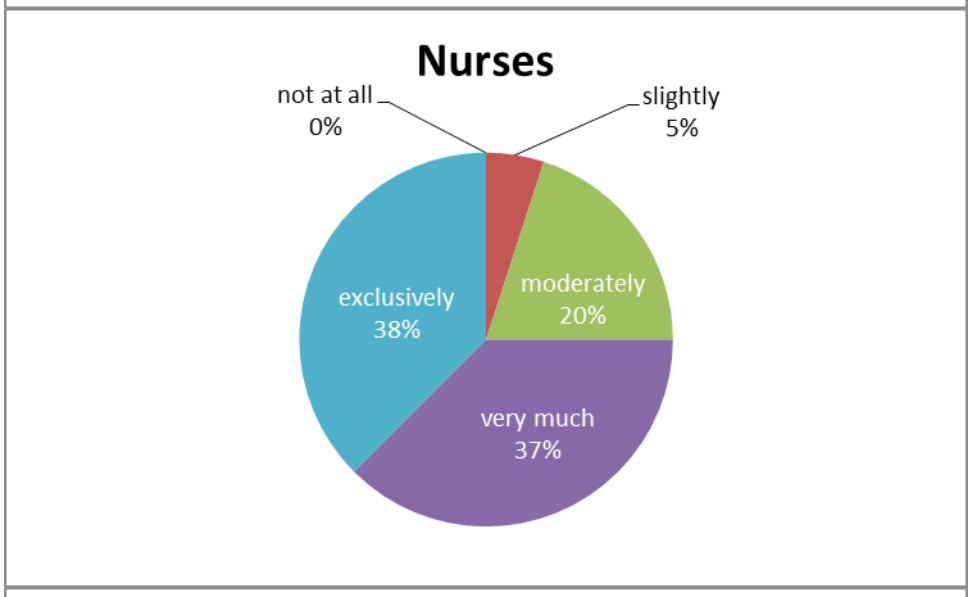


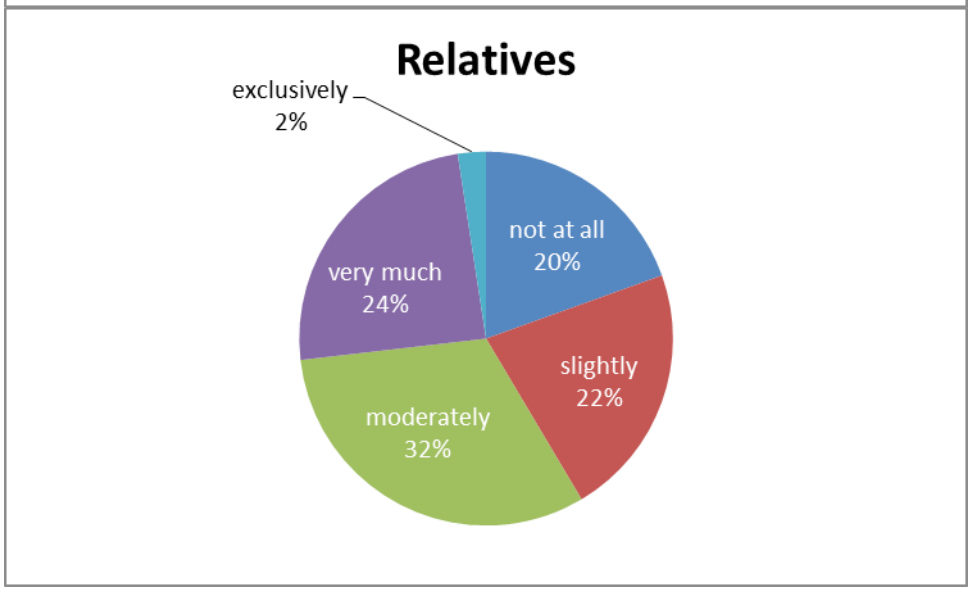
9. What is your opinion of such a device/robot which can alert the competent person /assistant or medical institution when critical value is detected?



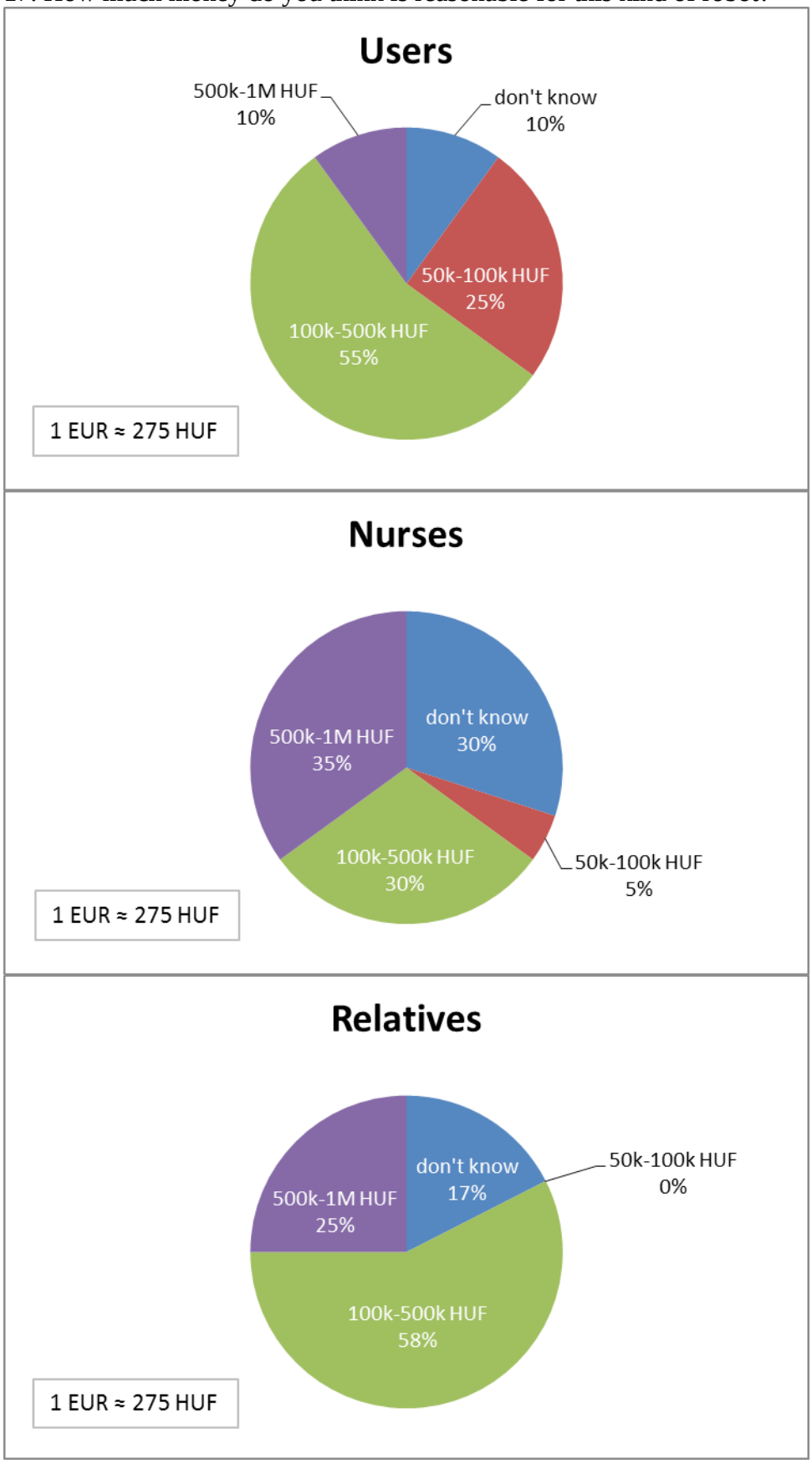
16. How much do you think the price of the device/robot would influence older people in purchasing?



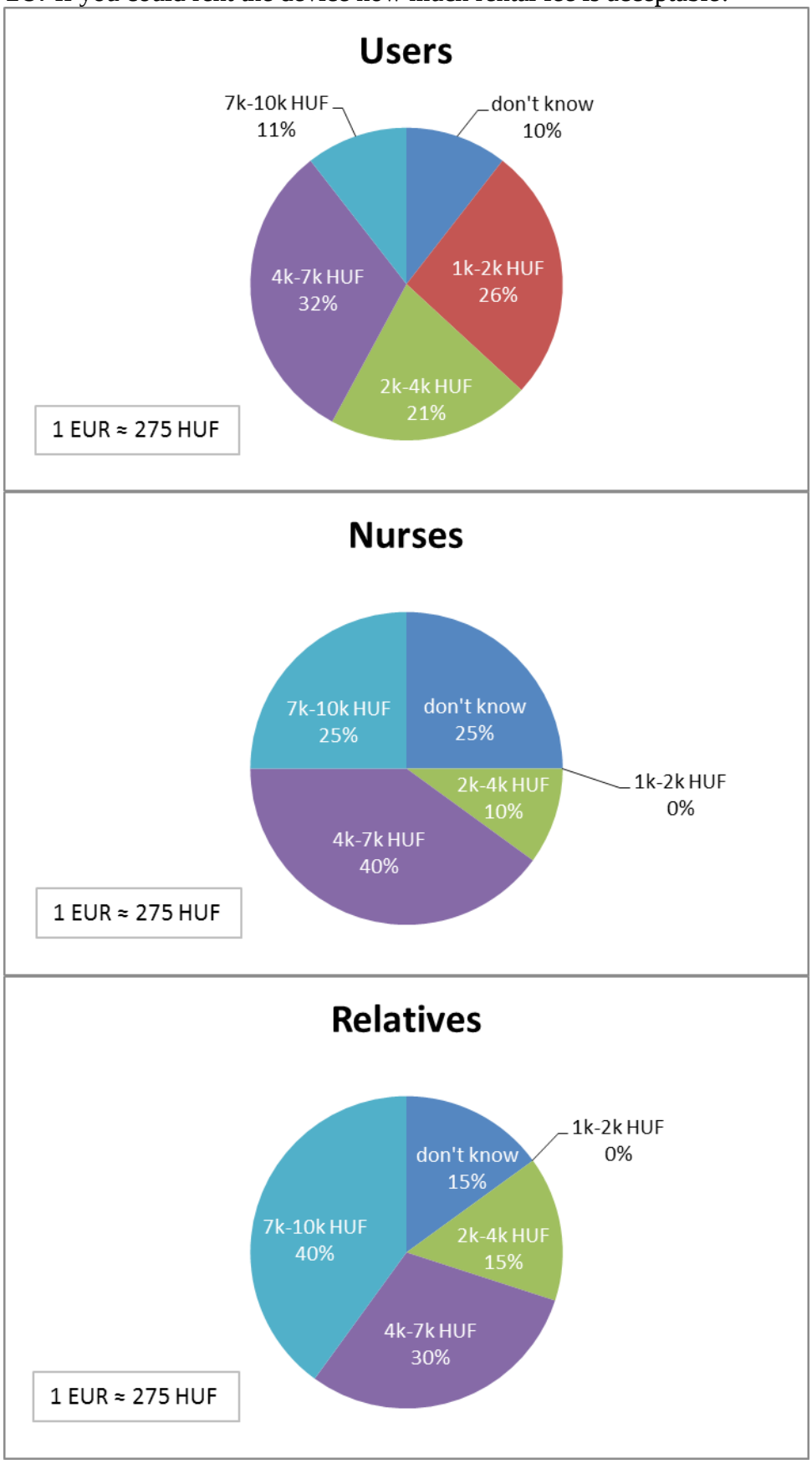




17. How much money do you think is reasonable for this kind of robot?



18. If you could rent the device how much rental fee is acceptable?



Conclusions:

- The biggest part of all three groups thought that an assistive robot could be useful for older people.
- People would like to pay much less than the potential price of the robot (both for the device and for the rental fee also).

Nurse questionnaire:	Answer
General:	I don't know, useless, maybe useful, useful, very useful
• How many assistive devices do the old person have in their household (TV, radio, telephone, washing machine, vacuum cleaner, microwave oven, toaster...)?	0,1,2,3, more
• How important do you think it would be, if these devices can be operated by a robot with voice command?	
• Do you think the older people would be glad with a new assistive device /robot in their home?	
Issues related to robot functions:	
• What is your opinion of such a device/robot which does smaller tasks by voice instructions instead of the older people (lifting a dropped object; carrying glass, phone, remote controller; calling somebody)?	
• What is your opinion of such a device/robot which can bring objects from one room to another instead of the older people by voice instructions?	
• What is your opinion of such a device/robot which can remind the older people to their tasks (daily tasks, taking drugs, arming/disarming the alarm)?	
• What is your opinion of such a device/robot which is able to periodically check older people's health (blood pressure, pulse, blood glucose, temperature)?	
• What is your opinion of such a device/robot which is able to forward older people's measured parameters (blood pressure, pulse, blood glucose, temperature) from time to time to a specified person / medical institution?	
• What is your opinion of such a device/robot which can alert the competent person /assistant or medical institution when critical value is detected?	
• What is your opinion of such a device/robot which can assist the older people to stand up when he/she fall, if it is possible and alerts the competent person?	
• Do you think the older people would like a device/robot which supervises their activities of daily living at home?	
• What is your opinion of such a device/robot which is able to call somebody instead of the older people by verbal request?	

• What is your opinion of such a device/robot which can manage the computer instead of the older people? For example dictating a letter to the robot, which can send its an e-mail.	
• What is your opinion of such a device/robot which is able to read the e-mails instead of the older people?	
• Prioritize the following robot functions! • patient monitoring, alarming • reminding the time of medication • moving objects • controlling home appliances • assisting with the management of telephone • assisting with the management of computer	
Economic aspects:	
• How much do you think the price of the device/robot would influence older people in purchasing?	not at all, little, moderate, very much, all that matters
• How much money do you think is reasonable for this kind of robot?	
• If you could rent the device how much rental fee is acceptable?	

Patient questionnaire:	Answer
General:	I don't know, useless, maybe useful, useful, very useful
• How many assistive devices/apparatus do you have in your household (TV, radio, telephone, washing machine, vacuum cleaner/hoover, microwave oven, toaster...)?	0,1,2,3, more
• Do you think it would be useful, if these devices can operate by a robot with your voice command?	
• Would you be glad with a new assistive device /robot in your home?	
Issues related to robot functions:	
• What is your opinion of such a device/robot which does smaller tasks for you by voice instructions (lifting a dropped object; bringing/carrying glass, phone, remote controller; calling somebody)?	
• What is your opinion of such a device/robot which can take objects from one room to another instead of you by your voice instructions?	
• What is your opinion of such a device/robot which can remind you your tasks (daily tasks, taking drugs, alerting flat)?	
• What is your opinion of such a device/robot which is able to periodically check your health (blood pressure, pulse, blood glucose, temperature)?	
• What is your opinion of such a device/robot which is able to	

forward your measured parameters (blood pressure, pulse, blood glucose, temperature) from time to time to a specified person / medical institution?	
• What is your opinion of such a device/robot which can alerts the competent person / assistant or medical institution when critical value is detected?	
• What is your opinion of such a device/robot which can assists you to stand up when you fall, if it is possible and alerts the competent person?	
• Would you like a device/robot which supervises your activities of daily living in your home?	
• What is your opinion of such a device/robot which can call somebody instead of you for your verbal request?	
• What is your opinion of such a device/robot which can manage the computer instead of you? (For example you can dictate a letter to the robot, which can forward by an e-mail.)	
• What is your opinion of such a device/robot which can read your e-mails?	
• Prioritize the following robot functions! • patient monitoring, alarming • reminding the data of medication • moving objects • controlling the technical tools in the house • assisting with the management of telephone • assisting with the management of computer	
Economic aspects:	
• In the previous issue the price of the device/robot how much influenced you?	not at all, little, moderate, very much, all that matters
• How much money do you think is reasonable for this kind of robot?	
• If you could rent the device how much rental fee is acceptable?	

Relative questionnaire:	Answer
General:	I don't know, useless, maybe useful, useful, very useful
• How many assistive devices/apparatus do your older relative has in his/her household (TV, radio, telephone, washing machine, vacuum cleaner/hoover, microwave oven, toaster...)?	0,1,2,3, more
• How important do you think for your older relative, if these devices can operate by a robot with voice command?	

• Do you think your older relative would be glad with a new assistive device /robot in his/her home?	
Issues related to robot functions:	
• What is your opinion of such a device/robot which does smaller tasks by voice instructions instead of your older relative (lifting a dropped object; bringing/carrying glass, phone, remote controller; calling somebody)?	
• What is your opinion of such a device/robot which can take objects from one room to another instead of your older relative by voice instructions?	
• What is your opinion of such a device/robot which can remind your older relative to his/her tasks (daily tasks, taking drugs, alerting flat)?	
• What is your opinion of such a device/robot which is able to periodically check your older relative's health (blood pressure, pulse, blood glucose, temperature)?	
• What is your opinion of such a device/robot which is able to forward your older relative's measured parameters (blood pressure, pulse, blood glucose, temperature) from time to time to a specified person / medical institution?	
• What is your opinion of such a device/robot which alerts the competent person / assistant or medical institution when critical value is detected?	
• What is your opinion of such a device/robot which can assist your older relative to stand up when he/she fall, if it is possible and alerts the competent person?	
• Do you think your older relative would be glad with a device/robot which supervises their activities of daily living at home?	
• What is your opinion of such a device/robot which is able to call somebody instead of your older relative by verbal request?	
• What is your opinion of such a device/robot which can manage the computer instead of your older relative? (For example the relevant people can dictate a letter to the robot, which can be forwarded by an e-mail.)	
• What is your opinion of such a device/robot which is able to read the e-mails instead of your older relative?	
• Prioritize the following robot functions! • patient monitoring, alarming • reminding the data of medication • moving objects • controlling the technical tools in the house • assisting with the management of telephone • assisting with the management of computer	
Economic aspects:	
• In the previous issue the price of the device/robot how much influenced you?	not at all, little, moderate, very

	much, all that matters
• How much money do you think is reasonable for this kind of robot?	
• If you could rent the device how much rental fee is acceptable?	