

# Creating accessible mobility apps for seniors through user-centric design process (T&Tnet project, AAL JP Call 4 - )

## Session A5. Navigation and wayfinding

Riitta Hellman, Karde AS

Universal Design 2014 (UD2014)

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# Karde AS

- In Oslo, Norway
- Founded in 2004
- 8 employees
- Turnover: 1,1 million €
- Business idea: ICT-related innovation projects within 2 main areas

# Main areas

eGovernment

Collaboration in public sector

- Information governance
- Semantics
- Organisational aspects

ICT-based aids for

- Elderly
- Persons with cognitive challenges
  - Memory impairment, e.g.
  - Intellectual disability

# Projects: elderly, memory problems



**Aldern**



**Sampo**



**TouchIT**

## Pre projects



**Mylife**



**T&Tnet**



**PIA**

## AAL JP projects

# Important focus: cognition

Memory or other thinking skills are cognitive abilities.

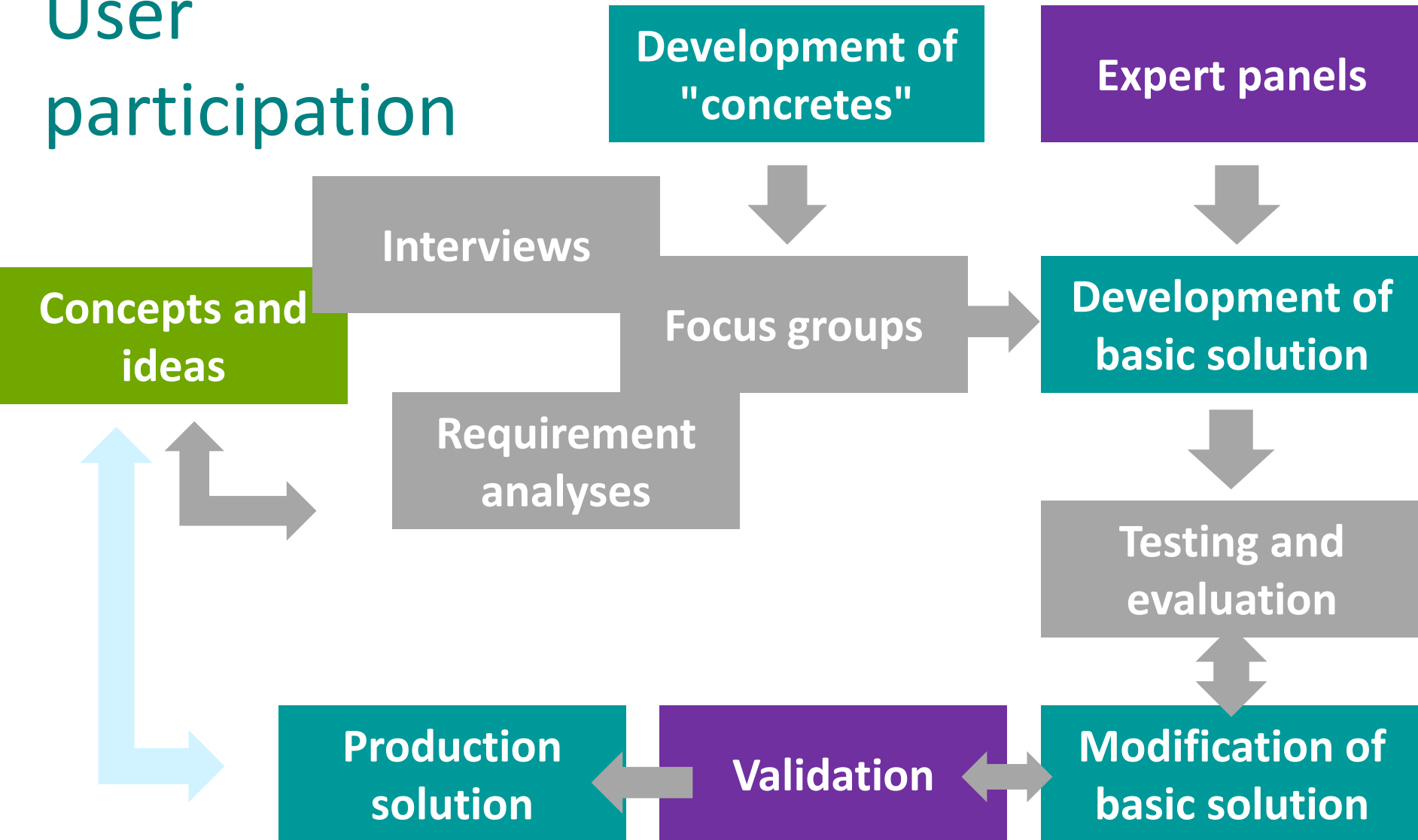
These include thinking, knowing, learning, remembering, judging, paying attention, and problem-solving.



These are higher-level functions of the brain and encompass language, imagination, perception, and planning.

[www.psychology.about.com/od/cindex/g/def\\_cognition.htm](http://www.psychology.about.com/od/cindex/g/def_cognition.htm)  
[www.sharpbrains.com/blog/2006/12/18/what-are-cognitive-abilities/](http://www.sharpbrains.com/blog/2006/12/18/what-are-cognitive-abilities/)

# User participation





Joy and pleasure  
Daily structure  
Independence  
Mastery and wellbeing  
Contact with carers  
Reduced stress for carers

## *Mylife*

"Multimedia technology to support independence for and participation by people with dementia"



## Memas™ tablet displays:

- Day, date, time
- Appointments and reminders today
- Calendar
- For pleasure: e.g. pictures, newspapers, radio and weather
- Contact me

**memas**®  
Your memory assistant



Relatives use internet to chose interesting content for the tablet, configure the tablet and and monitor the use.





Video clips on tablet  
or smartphone about  
activities of daily living

Made by relatives

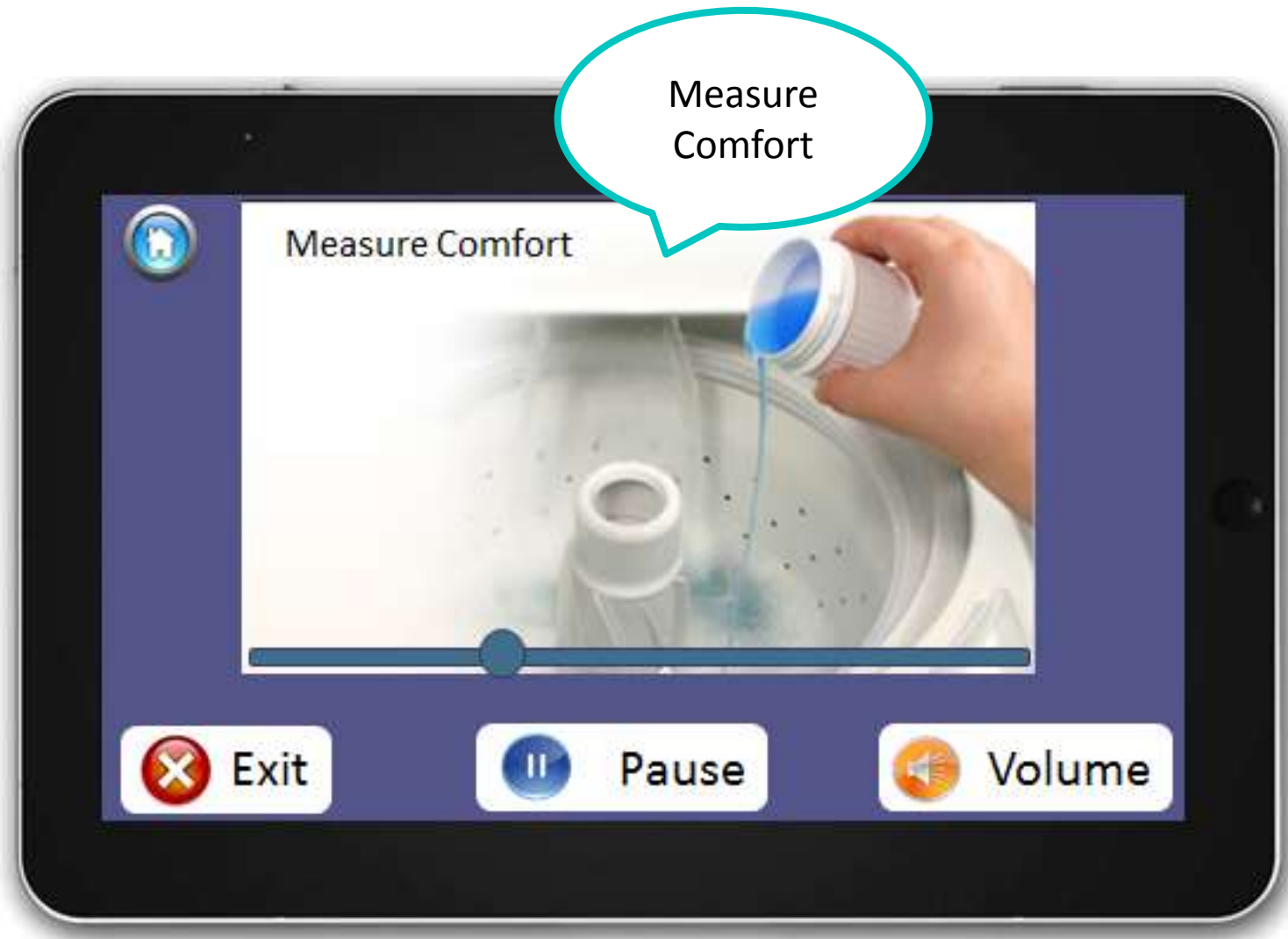
Shared via PIA's social  
platform

"Personal IADL Assistant"



# Sensor infrastructure





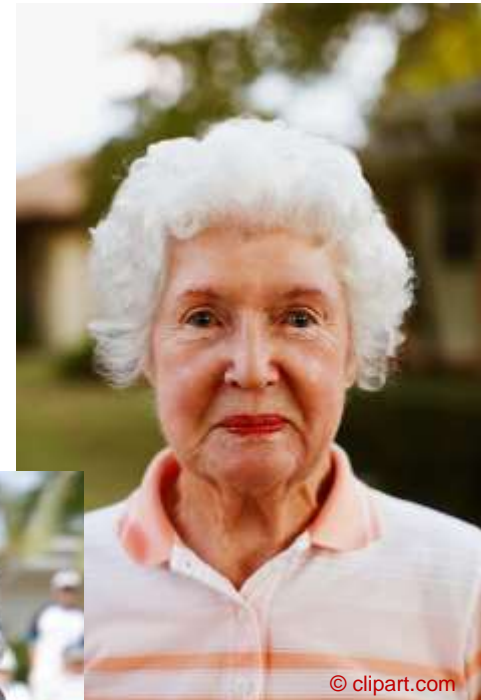
# Typical iterative work flow

- Analysis of requirements, wished and needs of
- Prototype development
- HCI approvability, usability and accessibility assessment
- Trials (prototype in real use)
- Interviews, observations, simple forms (😊 😞)

## Well-being and Quality of Life (QoL)

It is possible to maintain good Quality of Life (QoL) despite of memory impairments.

Support to daily living activities and well-being contribute to this.



# Quality of life

Domain	Subdomain
Discretionary activities: Performance of discretionary activities	Hobbies, recreational activities, <b>vacations</b> Work/productivity Being active

Source: Meryl Brod et al: : «Conceptualization and Measurement of Quality of Life in Dementia: The Dementia Quality of Life Instrument (DQoL) The Gerontologist Vol. 39, No. 1, 25-35 (1999).

# Quality of life

Domain	Subdomain
Mobility: Ability to travel out of the house	<b>Travel in neighborhood and outside of neighborhood</b> <b>Public transportation</b>

# Quality of life

Domain	Subdomain
Social interaction: Social relationships	Intimacy, happiness with family <b>Social participation</b>





Plan trip  
Navigation  
Accessibility tips  
Social network  
Learning system






**T&Tnet**  
Travel & Transport solutions through emotional-social NETWORKing

"Travel & Transport solutions through emotional-social NETWORKing"



# Personas

Aud Gjerdrum		Gjerdrum, Akershus		
Retired housewife		The Skeptic		
Mobility:	Technology:	Economy:	Social:	
				
<b>Age:</b>	67	<b>Limitations:</b>	<b>Travel story:</b>	
<b>Family:</b>	Married to Hans, children, grandchildren.	<b>Cognitive:</b>	Healthy. Cross-words for experts keep her memory sharp.	<i>"My husband drives me if I want to go somewhere special. I do have a driver's license but I haven't been driving since 30 years ago. And then I take the bus. It's practical and cheap. I call Ruter if I need to know the timetables. And then of course, we have the senior bus tours to all over Europe. We use to travel every fall and spring."</i>
<b>Social:</b>	Family and sewing club.	<b>Sensory:</b>	Good vision and good hearing.	
<b>Economy:</b>	She has enough money but does not spend much. She saves a lot so that her children and grandchildren can inherit a nice sum of money.	<b>Motor:</b>	A bit slow walker; stiff legs.	
<b>Geography:</b>	Lives on the countryside. She enjoys the nature around, and the calmness.	<b>Attitude:</b>	<b>Accessibility story:</b>	
		<i>"I think we need to travel a bit. To see around, just for our grandchildren's sake. They deserve grandparents who have seen something else, too, than the Gjerdrum village. We travel by bus or by train. It is practical, and very social as many other couples we know travel along. We do not fly. It is very expensive and not so safe. You can lose your luggage and they can cancel the flights. Hans agrees on this."</i>	<i>"I am not a risk-taker. I think that the ground should be stable and safe for elderly people. What would happen to Hans if I broke my leg and arrived at a hospital? And another thing... I'm not a great fan of huge crowds of people either. I feel sort of trapped"</i>	
<b>Technology use:</b>	She has an old Nokia cellphone. She is starting to realize that a more modern phone might be convenient. Her grandchildren have given her an old PC that she uses for online banking and simple e-mails.	<b>Touristic interests:</b>	<b>Technology story:</b>	
		<i>"Bus tours to European cities with other seniors are really interesting. We go to theater and museums. Musicals are also very nice. I'm sure Hans agrees. There is just one problem. We have a new tour leader and she makes the tour programmes on her PC and we should participate in this affaire somehow. The previous leader called us to discuss. Now it is all on PCs. I do not know anything about the next tour yet, and I notice that others do already."</i>	<i>"I find all the new gadgets rather unnecessary and expensive. All those silly things people do... I've seen grown-ups stare at their telephones on a bus, with ear-plugs and music that everybody around can hear! It's not even music, I say."</i>	

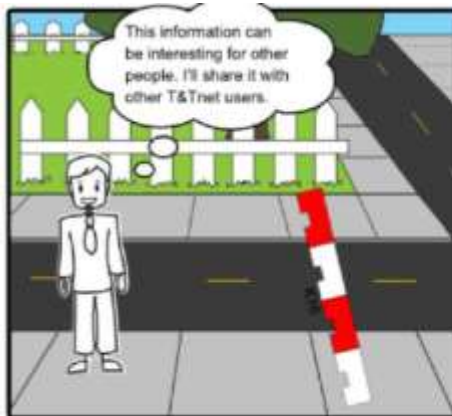
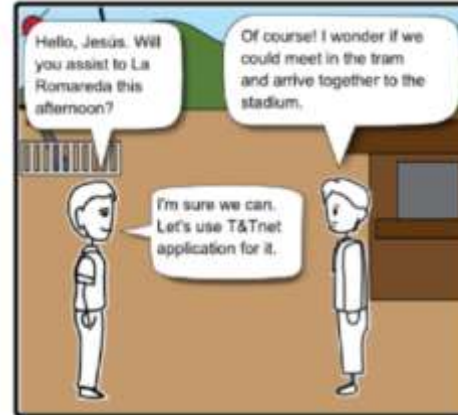
Christian Dahl		Bærum, Norway		
Early retirement		Techno-freak		
				
<b>Age:</b>	65	<b>Limitations:</b>	<b>Travel story:</b>	
<b>Family:</b>	Wife (Lene Storm Dahl), ex-wife, children from previous marriage.	<b>Cognitive:</b>	Has experienced stress-related symptoms during the last years, some concentration problems.	<i>"I have two cars, and drive my Mercedes whenever I can. When I'm in France, I usually rent a boat, I really enjoy sailing. I often travel far by plane, and then economy class is not an option, I want comfort!"</i>
<b>Social:</b>	Large social network. Plays golf, active in Rotary.	<b>Sensory:</b>	No problems at all.	
<b>Economy:</b>	Very good. He can travel anywhere. Villa on Neslya, summerhouse in France, ski-in-ski-out apartment on Kvitfjell.	<b>Motor:</b>	No problems, really well fit. Runs marathons.	
<b>Geography:</b>	Christian has two cars. He uses rental cars when in France or other places. Travels a lot by plane.	<b>Attitude:</b>	<b>Accessibility story:</b>	
		<i>"I really like trying out new things, I get bored rather easily. I am always online, that way I will not miss out on anything."</i>	<i>"I have no physical problems with getting around. However, I always make detailed planning and lists, so that I'm always in full control."</i>	
<b>Technology use:</b>	Christian is kind of a techno-nerd, and has double of everything: iPhone and Samsung-phone, iPad and galaxy Tab, PC and Mac. He enjoys trying out new things, and his friends often ask him for advice. Cost is not an issue.	<b>Touristic interests:</b>	<b>Technology story:</b>	
		<i>"When travelling, I always make detailed plans before I go. I'm a very active person and I love sailing, diving and things like that. I'm a passionate art-collector, and buy art on auctions abroad. I also have to help my wife finding the places she wants to go to. She loves shopping!"</i>	<i>"I'm really into all things technologically, and take my pride in always having the latest gadgets and apps. When travelling, I always make my reservations for hotels and tickets online."</i>	

# Focus groupus



(Photo: Cure)

# Scenarios and story-boards



# Mock-ups (paper prototypes made as realistic as possible)

- Choice of route
- Navigation and guidance
- Help
- Preferences
- Accessibility tips



# Functionality tree (paper prototypes)



(Photo: Cure)

# Mock-up tasks organised in realistic sequences of sub tasks

## Now you shall ...

- What would you do if you should ... instead?
- What do you think this button does?
- Is there anything that you feel is missing?
- What do you think about the general appearance?

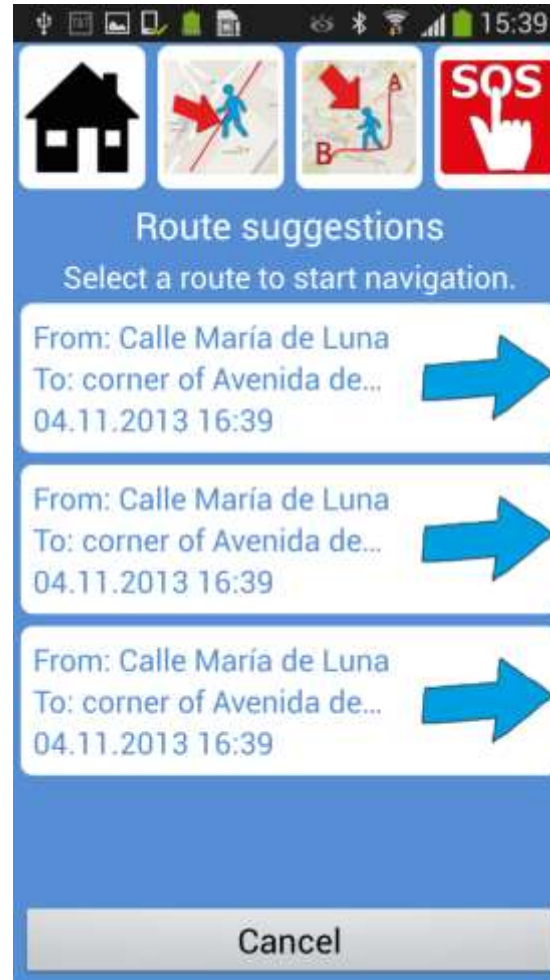
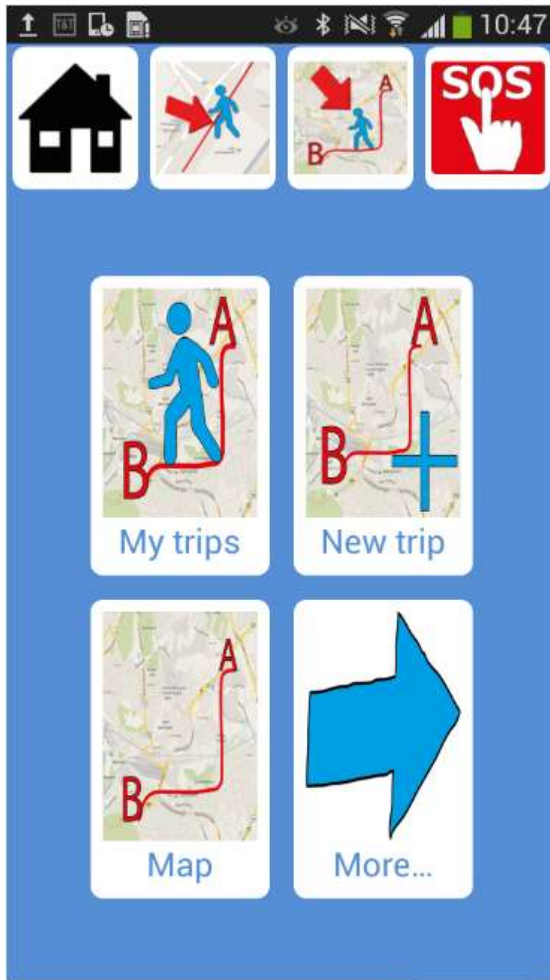
# "Senior design principles"

1. Enable gradual simplification.
2. Enable direct manipulation.
3. Offer alternative modalities.
4. Simplify the language.
5. Make visualisations relevant.
6. Enable alternative presentation styles.
7. Model real world artefacts and their behaviour.
8. Make it easy to start from the beginning.
9. Acknowledge external communication.
10. Let the users be users.

"Accessibility and usability of ICT for elderly"  
at UD2012



# Real app with "sketch finish"



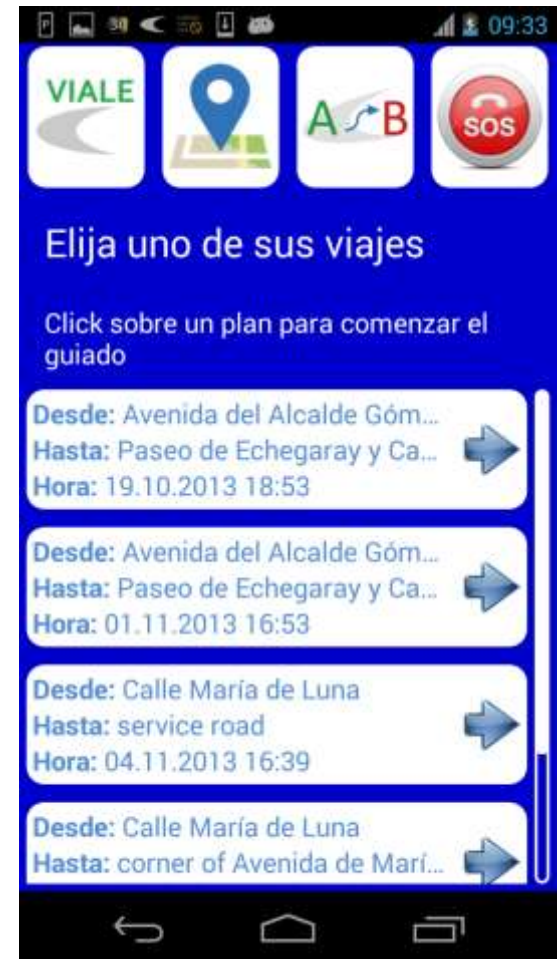
# Tests and trials



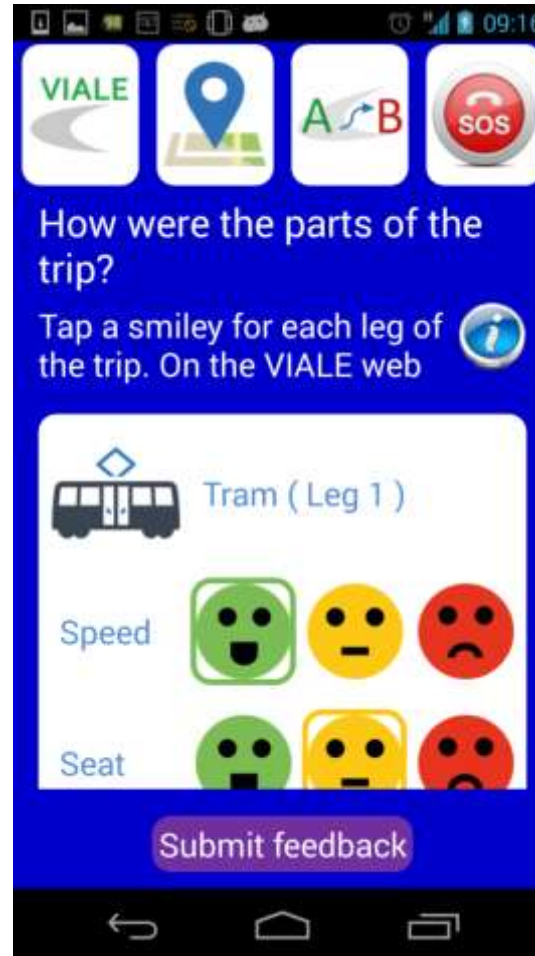
(Photo: Cure)



# Final app (1)



# Final app (2)



# Basic working principles

## Project

- End user involvement
- Expert involvement
- Carer competence
- Ethical guidelines
- Multidisciplinary

## Product / service

- Start with end user needs
- Keep it simple
- Accessible design
- Adaptive, personalisable
- Non stigmatising