Making navigation simple? Initial user studies within the NavMem project

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NavMem- Navigation Support for Older Travellers with Memory Decline

- The NavMem project is about developing a mobile companion for people with memory decline in order to support their navigation and orientation and at the same time promote a feeling of safety.
- AAL project - NavMem (AAL-2011-4-122) is co-funded by the AAL Joint Programme and the following national authorities

VINNOVA

Bundesministerium für Bildung und Forschung

Ministry of Health, Welfare and Sport

AAL AMBIENT ASSISTED LIVING

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NavMem partners

- OFFIS – Institute for Information Technology
- Siemens AG
- Swedish Stroke Association
- Lund University
- NorconsultAstando
- Roessingh Research and Development
- Navex (Navevo)

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Initial user studies in Sweden

- Interviews
- Focus groups
- Prototype development
- Initial user tests

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Interviews

- 10 persons interviewed - 7(6+1) of these had had a stroke themself
- Semistructured interviews

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Identified areas of relevance

- Fear of falling
- Half-sided motor problems
- Memory problems – simple support needed, keep things short
- May be hard to process too much information, neglect
- Navigation hard with memory problems
- Accessible routing important
- Aphasia – help finding words, images useful
- Need to take reduced vision or hearing into account

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Expert interview – occupational therapist

In general good coverage. Additionally:

- Brain tiredness
- Difficulty initiating action

Open question

- Maps (spatial rotations)?

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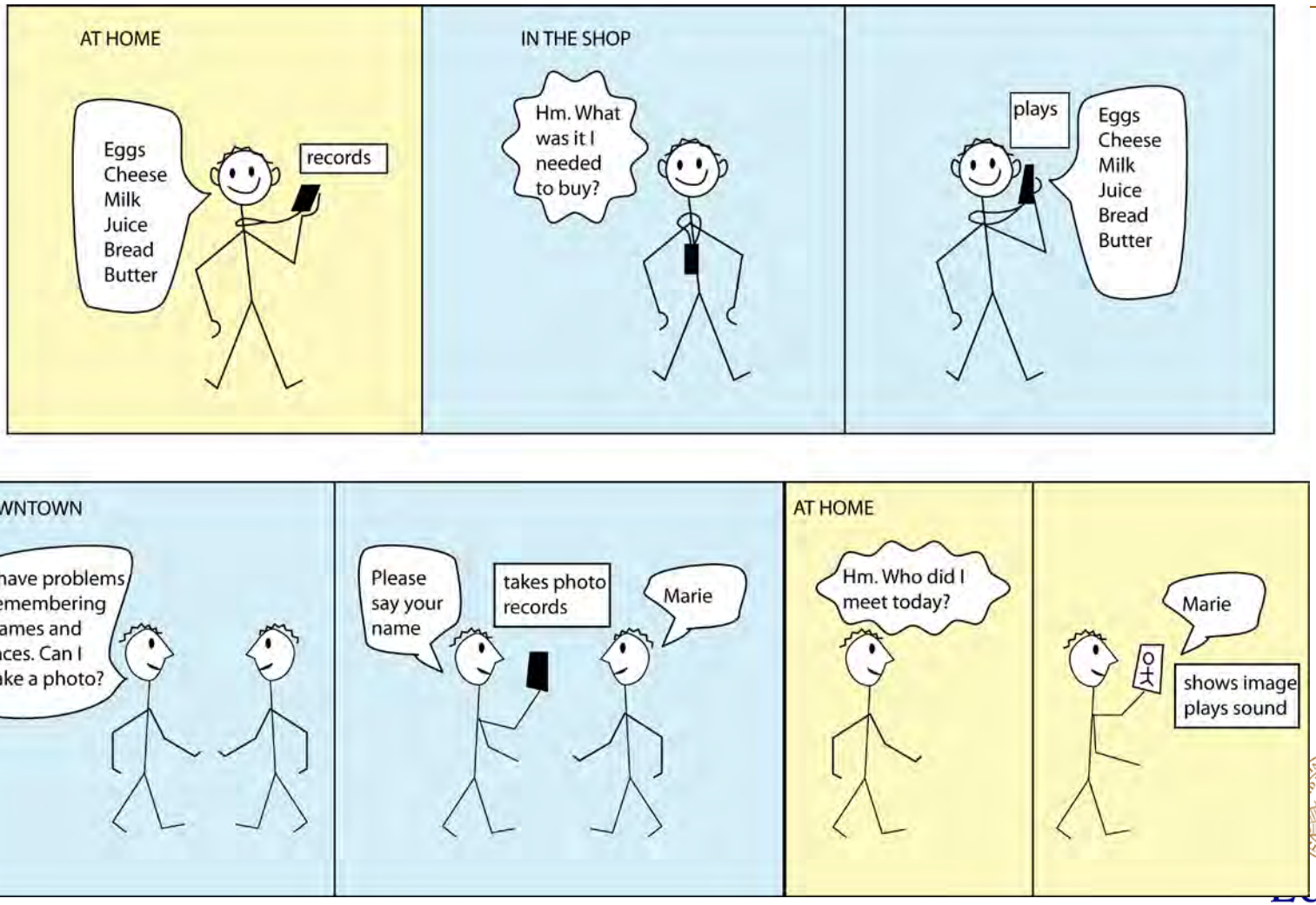
Scenarios



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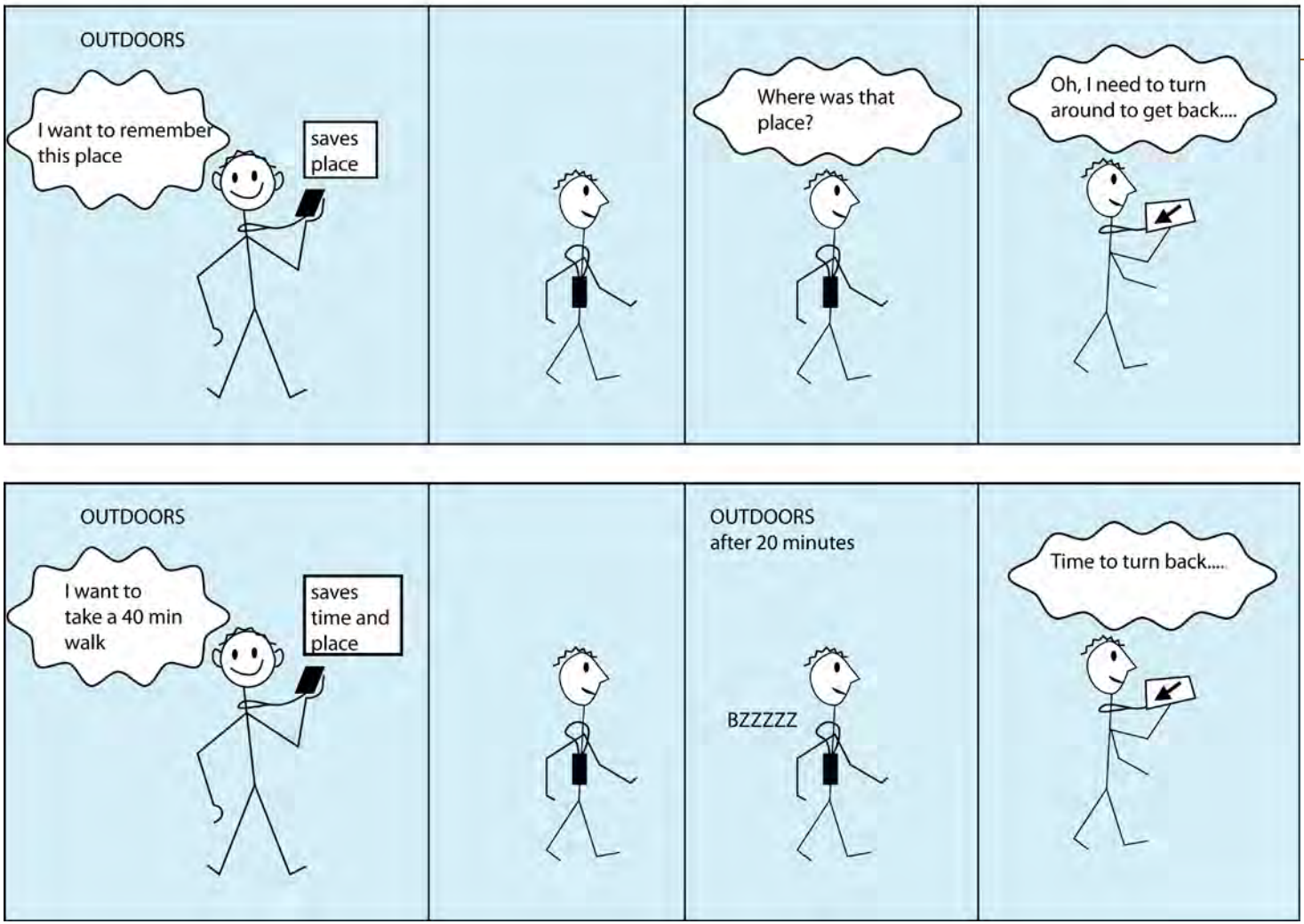

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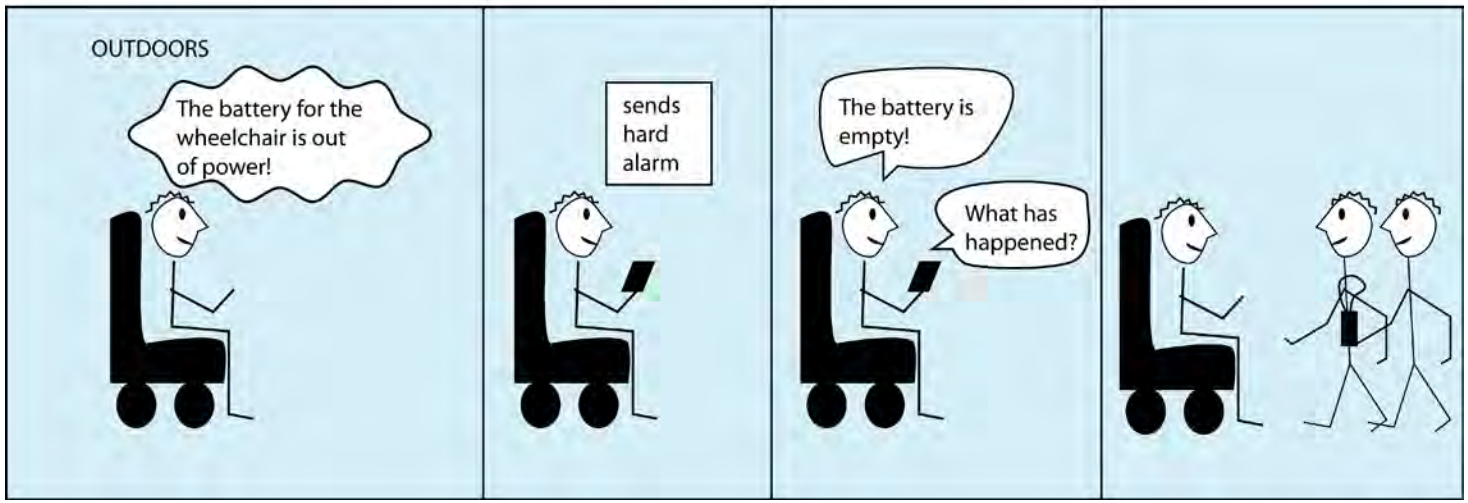

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Scenarios

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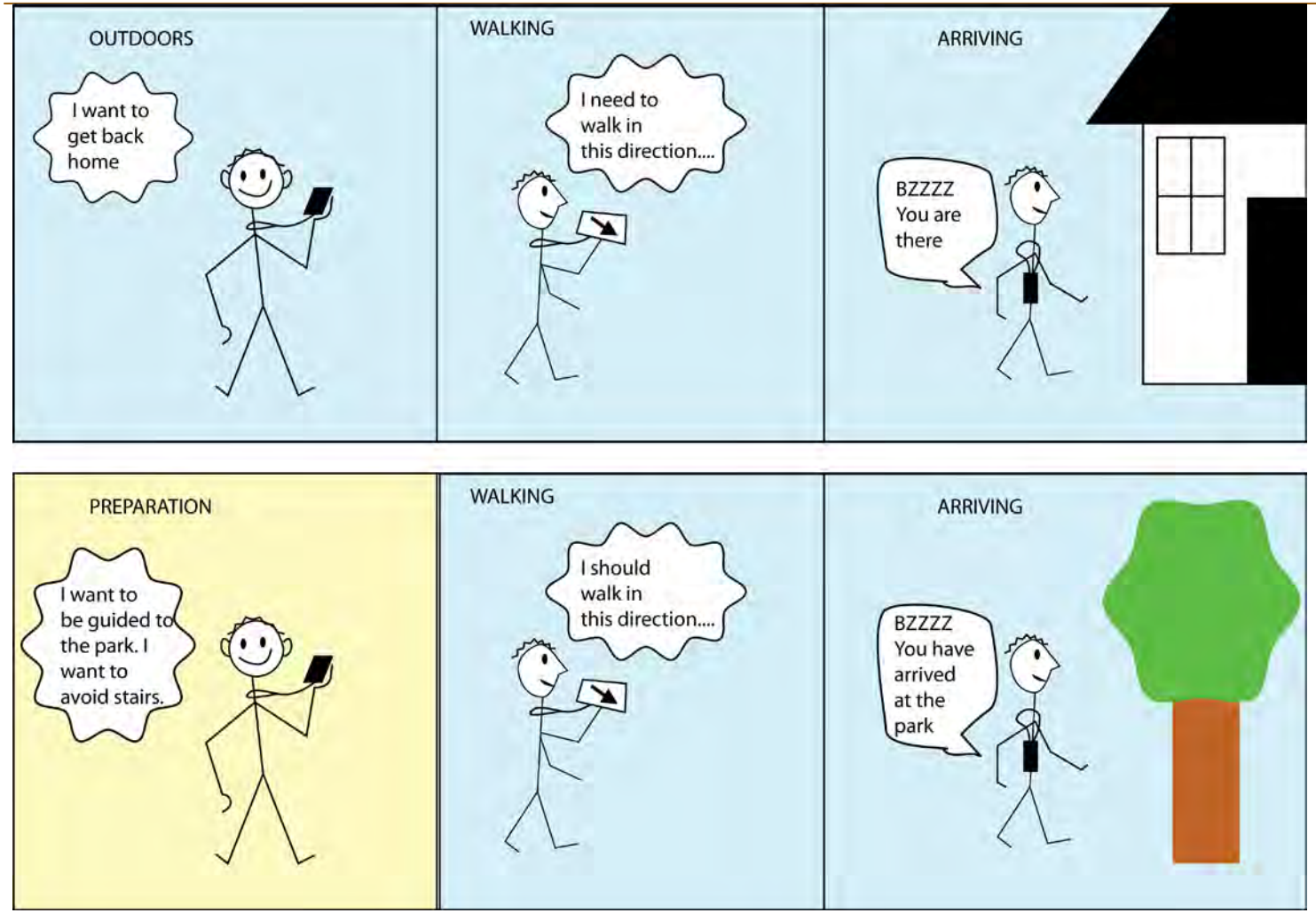

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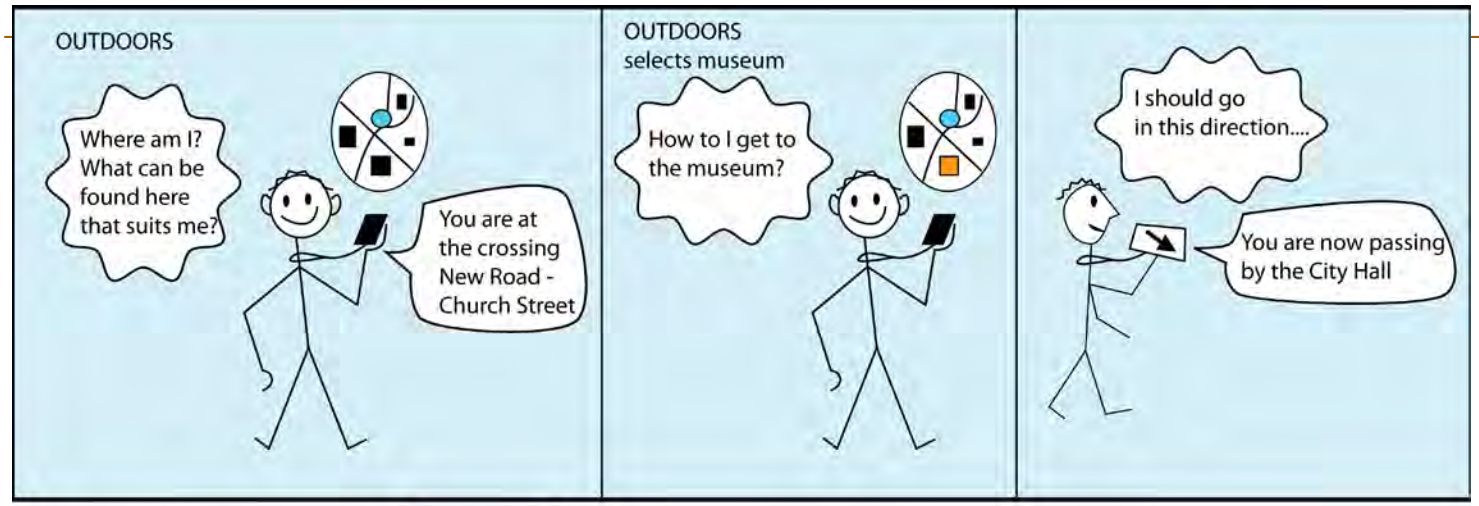

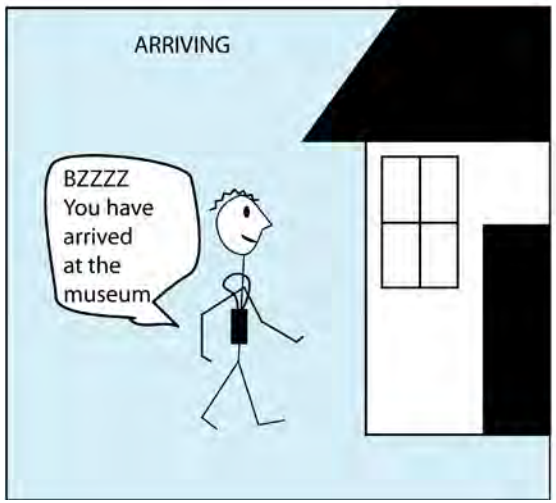

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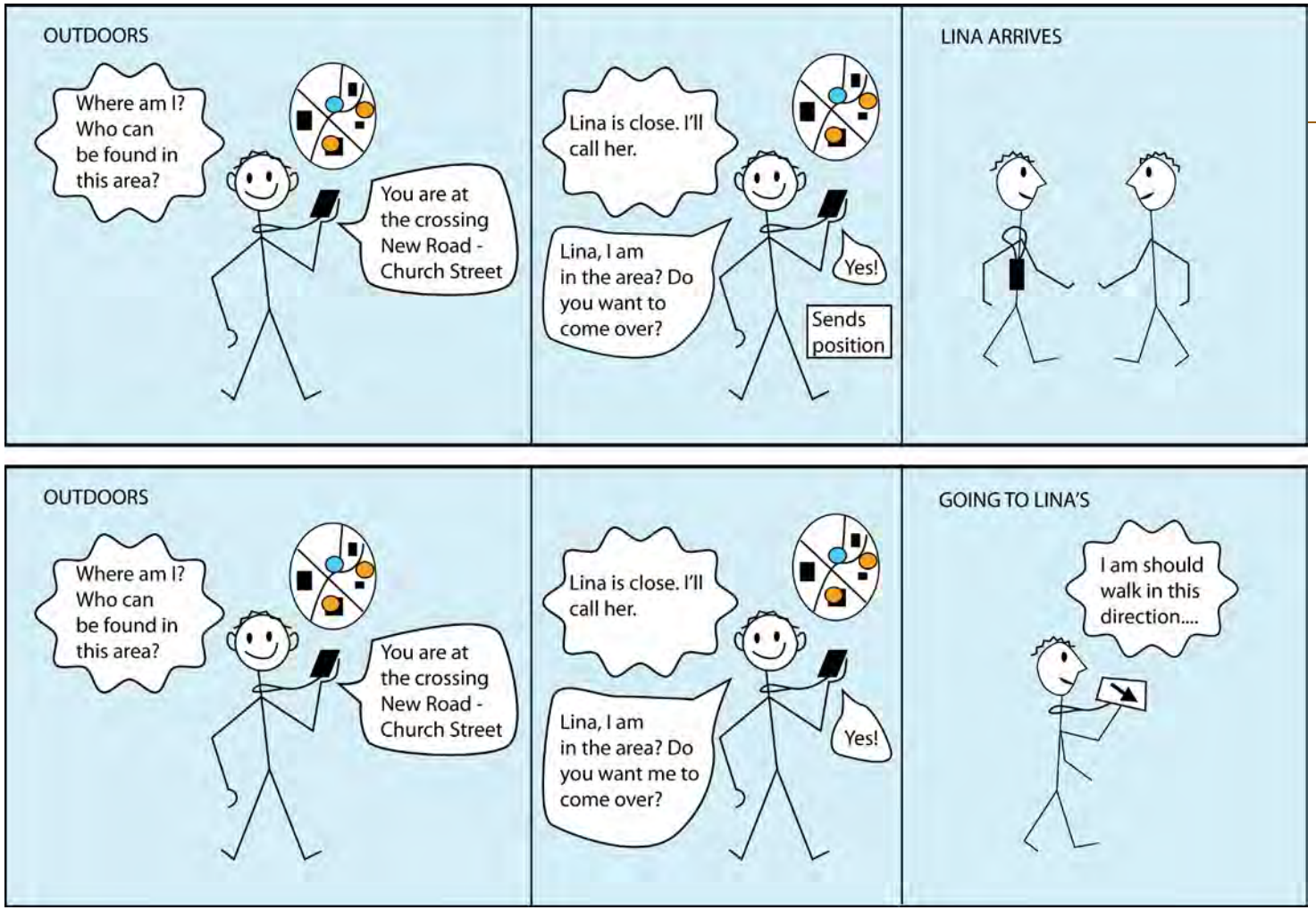

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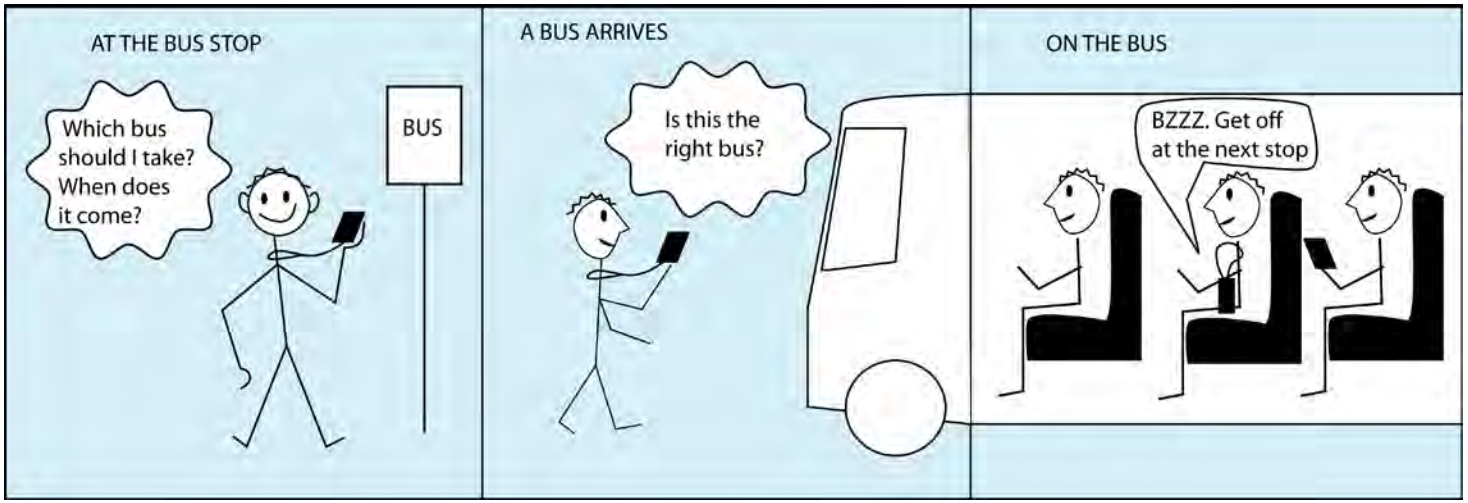
Additional scenario



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Focus group discussion, resulting requirements

- Security and safety
- Flexible and adaptable
- Allow one handed use
- Easy to manipulate
- Easy to bring
- Easy to remember
- Keep texts short
- Minimize number of steps
- Limit the amount of information

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Requitements continued

- Appropriate reminders
- Images are useful
- Provide multimodal information
- Concrete and grounded information

Desired functions

- Simple memory aid
- Lifeline
- Accessible routing
- Simple and advanced navigation support

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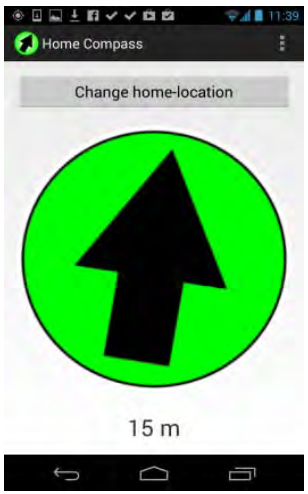
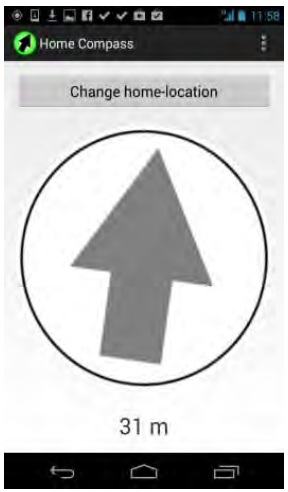
Prototypes

- Prototype 1, HomeCompass
- Prototype 2, NavMem Explorer





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NavMem explorer

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Tests, November/December 2013

- Use NavMem explorer to go some distance away
- Use the HomeCompass to get (nearly) back

Characteristic	Value
Age (years)	58-80 yrs (average 70)
Gender	5 women, 8 men
Navigation (selfreporting)	2 with severe difficulties 4 with moderate difficulties 4 with good skills 3 with excellent skills
Hearing	1 moderate hearing problems 1 minor hearing problems
Vision	1 with severe vision problem 1 with moderate vision problems 4 with minor vision problems 7 with full vision
Motor abilities	3 used electrical wheelchairs 1 used a manual wheelchair 2 used walkers 7 fully mobile

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Test trail

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Results

- All test persons could follow the direction indication

- 11 persons reached the goals
- 1 person got exhausted and was unable to complete
- 1 person was unable to walk the trail due to bad weather and tested indoors
- Problems understanding the test setting
- HomeCompass not pointing home?
- Turn by turn vs as the crow flies
- Multimodality important
- Attachment to wheelchair, walker etc
- GPS updating (or not), accuracy….
- Magnetic disturbances

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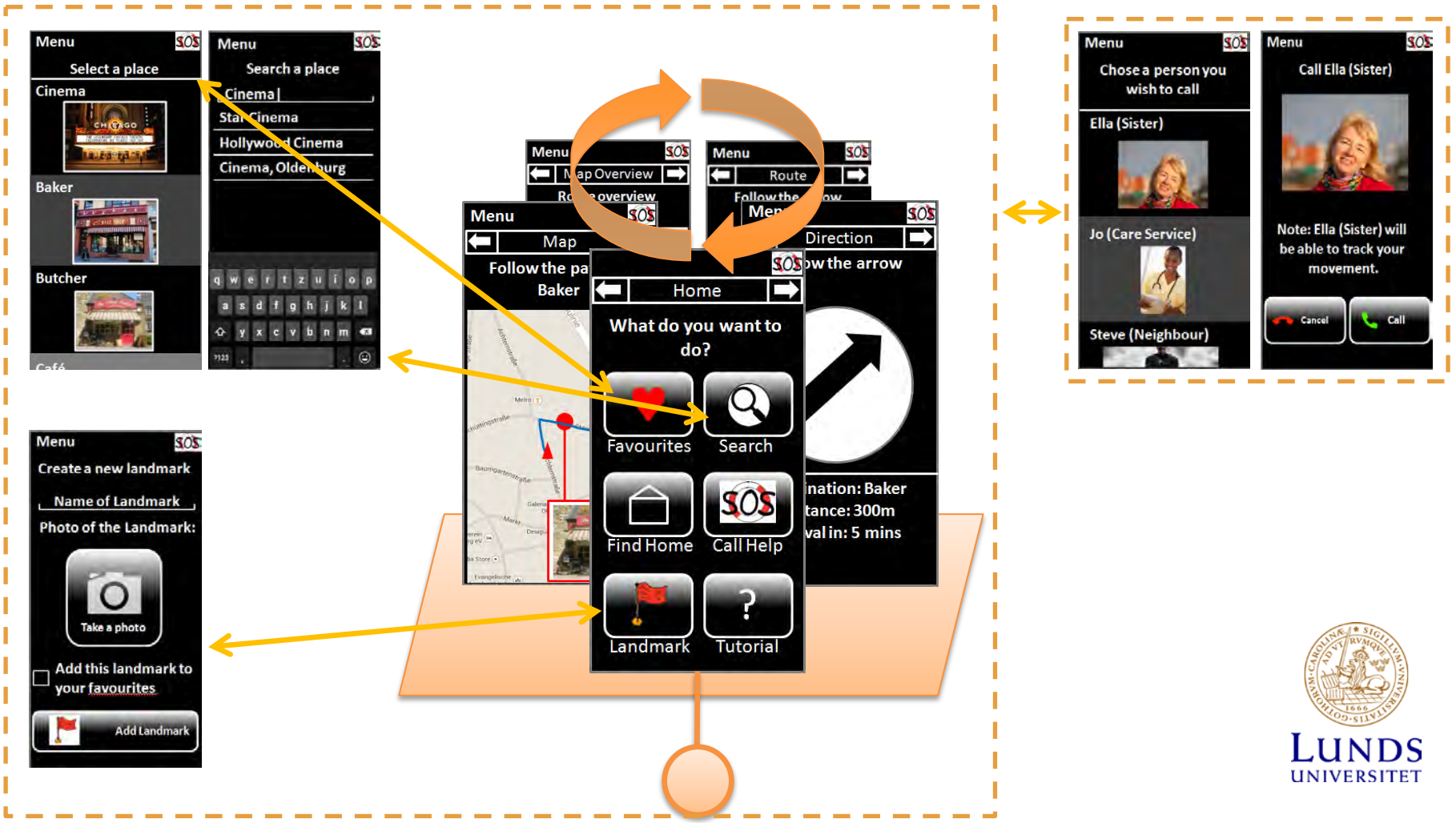
Future work

- Improved HomeCompass
- Tailor make routes?
- Improved NavmemExplorer

- Field tests!

NavMemExplorer



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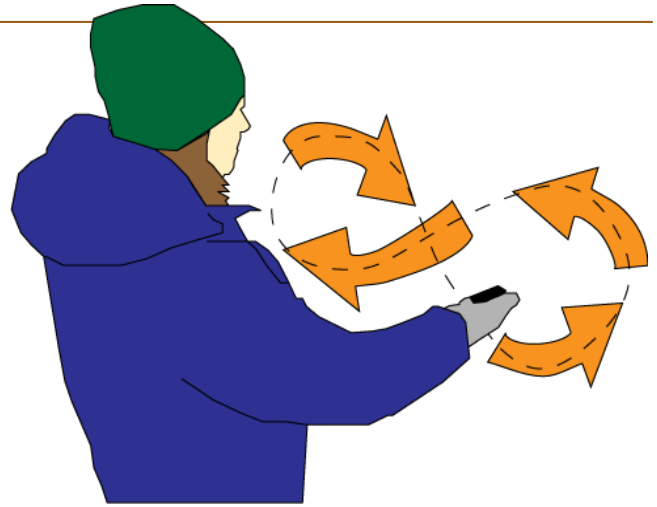
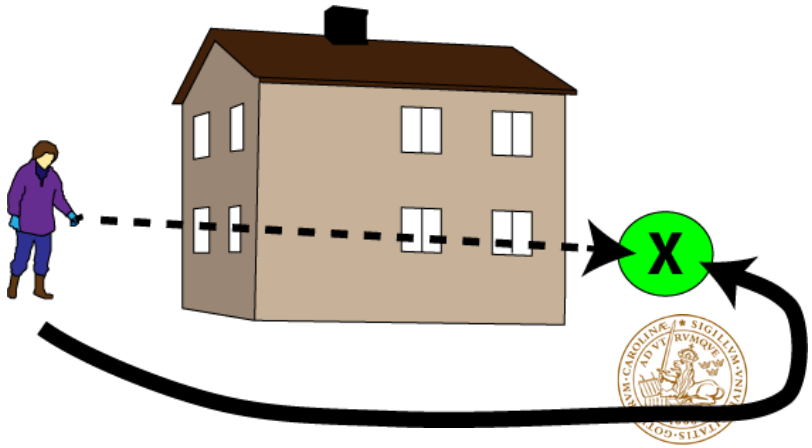
Open questions

- How to deal with poor GPS?
- How to deal with compass problems?
- What happens if no one answers a call for help?
- Guiding design?





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Frågor?

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