



Exploring Future Challenges for Haptic, Audio and Visual Interfaces for Mobile Maps and Location Based Services



Authors



User vs usage?



User vs usage!



Accessibility



Main barriers to inclusive design

- Lack of time and budget
- Lack of knowledge and tools for practicing it
- Perception that inclusive design is not a need of their end users
- Lack of business case
- Lack of internal support
- Required cultural change
- Too difficult
- Compromises aesthetics

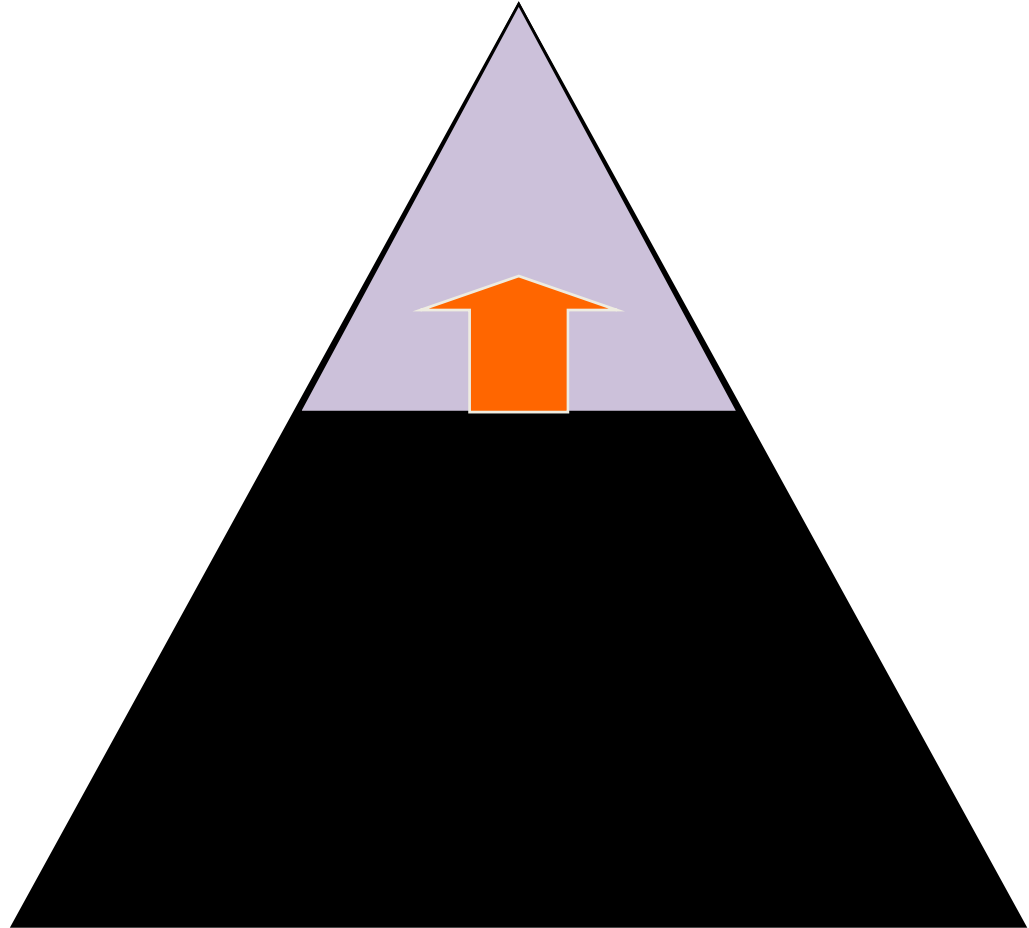
Goodman, J., Dong, H., Langdon, P., Clarkson, P.J., (2006), Increasing the uptake of Inclusive Design in industry, *Gerontechnology: International Journal on the Fundamental Aspects of Technology to Serve the Ageing Society*, 5 (3). pp. 140-149. ISSN 1569-1101

Challenges

- Map usability – also when mobile
- Context, adaptivity, filtering
- Non-visual interaction design
- Accessibility / Inclusive design

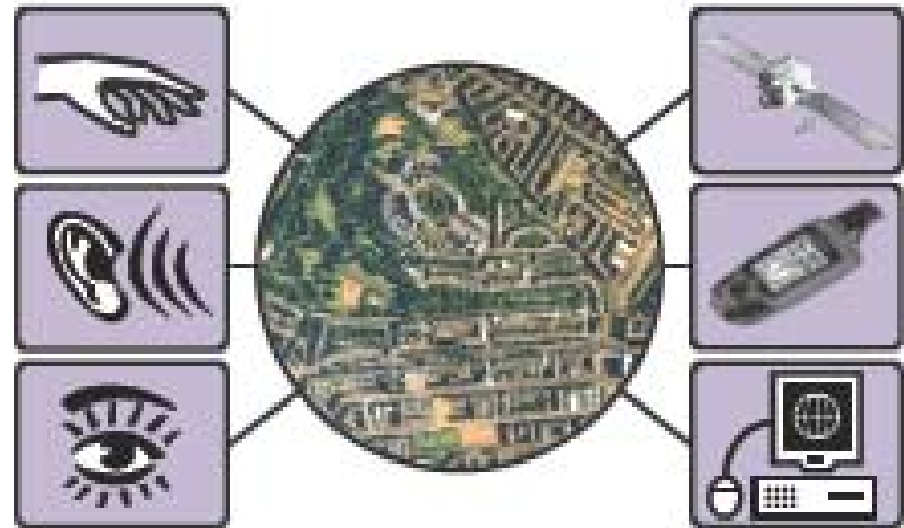
HaptiMap project

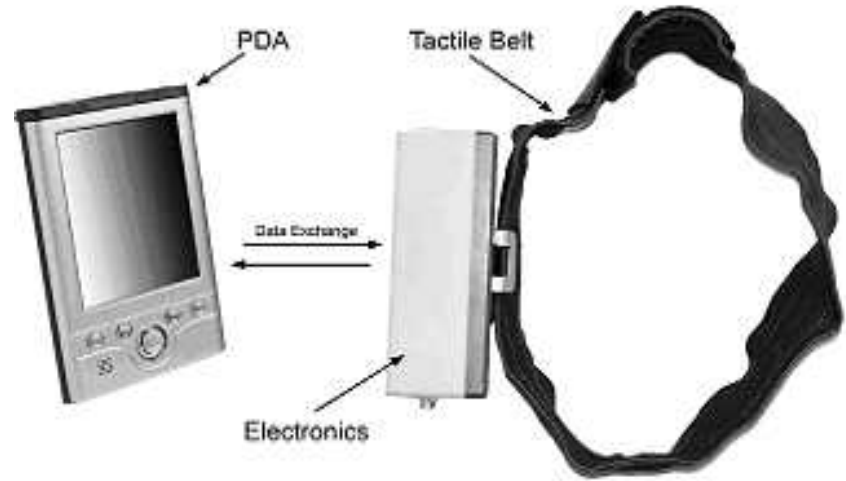
- Persons using assistive devices
- Persons using mainstream devices



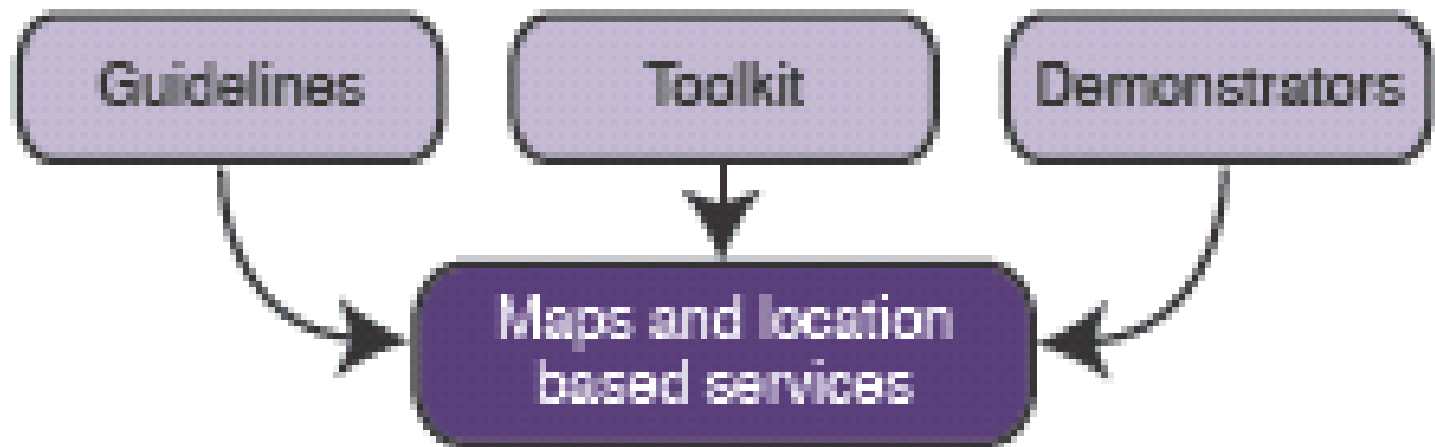
More accessible maps & LBS by

- Using several senses like touch, hearing and vision.





What we will do



How to know what people want?

- Need to include the mobile context
 - Interviews (ordinary and in context), technology demos and focus groups
 - Workshops (with demonstration walk)
 - Diaries
 - Lo-fi Wizard of Oz (mobile oracle)



User test with elderly and low vision

- 5 elderly people between 67-78 and three relatively young students that are visually impaired
- Part 1 – discussion and scenario walk
- Part 2 – diary study
- Part 3 – design workshop and simulation walk



Common points

- Information about surroundings - landmarks
- Hands-free and also to some extent eyes-free
- Rerouting vs telling you you made a wrong turning
- Orientation in the environment
- Appropriate feedback/interaction (loud enough, visible enough, touchable enough etc. – and easy to understand).
- Confirmation (am I on the right track)
- Correct info in the map (footpaths, bicycle paths etc) & accurate position

Low vision

- Magnifying glass
- Not standalone
- Not too much sound
- Easily distinguishable landmarks
- Layered info
- Adaptable (modalities AND level of description detail)
- No zoom limit
- Backtracking

Low vision

- Seamless integration with peripherals and other functionalities in the PDA/handheld - functions should not interfere with each other
- Context specific POI searches
- Route teaching (user teaches device)
- Route connection (extending known routes rather than calculating new ones)
- Visual simplicity (think 3D first person game for kids)

Elderly

- Standalone
- Few buttons
- Simple
- Only info when needed (discreet)
- Reliable

Mobile Oracle

- The Mobile Oracle is an extension of WOZ, adds an “on demand” component to force users to explicitly request the information they need
- 15 users (sighted, visually impaired, and elderly)
- A shopping scenario where the user was asked to navigate in a shopping mall, to investigate three different types of items and select one of these



Mobile Oracle

- Content overview
- Spatial layout
- Direction/route
- Distance
- Notification/prompts
- Confirmation
- Content
- Recommendation
- Memory
- Time
- Capability



Still much to do...

