

Beyond Usability: a New Frontier for User-Centered Design of *Future Internet* Services

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what's wrong with usability

- usability (ISO 9241-11 - 1998)
 - *the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use*
- beyond effectiveness and efficiency (and satisfaction?)
 - displaying status, reducing anxiety, maintaining self-esteem, respecting diversity, ...

what's a telephone
in the words of my
grandmother:

*“to call my daughter I
have to digit 567652”*

*“the phone is ringing, I
wonder who's calling?”*

*“I can't call my sister
now, she is not at
home”*





Mobile phone in 1989

(<http://it.youtube.com/watch?v=ptbJZ9HBw2k>)





Mobile (phone) in 2008



(some) users have a different culture

- language
 - a (tele)phone is literally something to talk with somebody who is not here?
- practises
 - blogging is a respectable activity but not the main concern for everybody ...
 - ... yet many people keep diaries
- norms
- values
- ...

the Columbus way

“[...] they all go completely naked [...] they would be good servants [...] they appear to have no religion [...] which I have ordered to be taken and carried to Spain in order to learn our language and return [...]”

C. Columbus, 1492



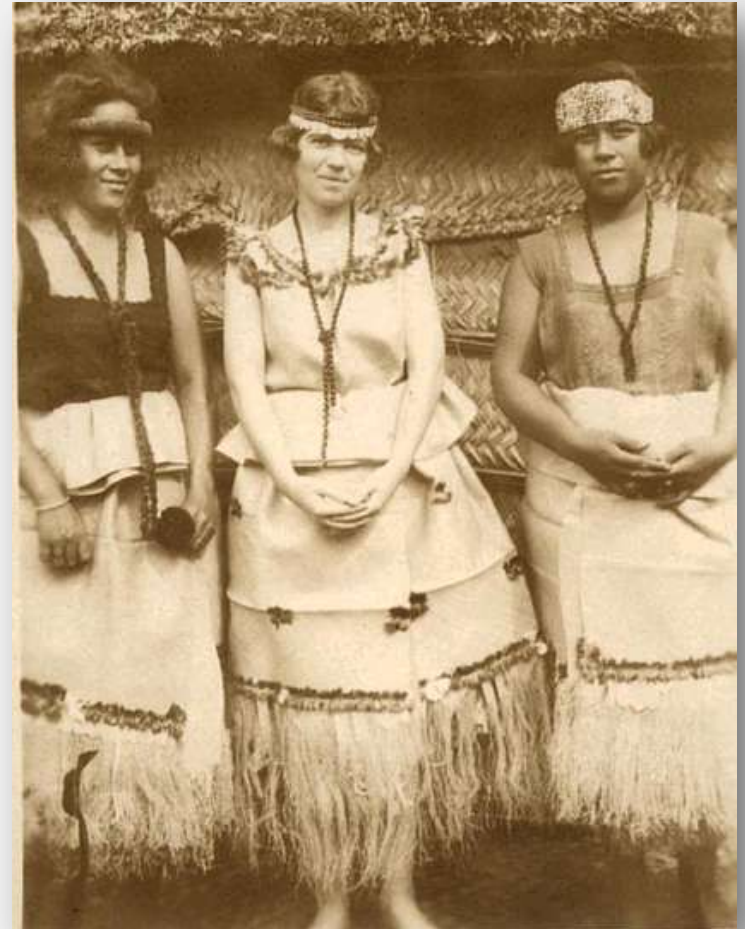
the *Columbus way*: elderly needs just a simpler technology!

- technologies should always be kept as simplest as possible
 - ... though not simpler than that
- there is no evidence that older people reject technology
 - more than people of other ages
- elders accept and adopt technology
 - when it meets their expectations



the “other” way: the designer as an anthropologist

- understand the culture
 - language, habits, practises
- translate the technology
 - into something comprehensible and acceptable
- possibly, learn something in the process



Margaret Mead in Samoa, 1926

designing by familiarity

- design technologies from the cultural values of users
 - needs, limitation, expectations, values, social practices, ...
- not necessarily user-driven
 - don't ask users what technologies they want (usually they don't know it anyway) ...
 - ... the role of the designer is to translate technologies concepts into familiar terminology

a case study from Netcarity

Networked multisensor system for elderly people:
health **care**, **safety**, and security in home
environment

- Integrated Project
- VI Framework Programme (call 6)
- 14 partners from 5 countries

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Personas: meet Nina

La signora Nina

Nome: Nina

Età: 68 anni

Occupazione: in pensione da 10 anni. Prima lavorava come segretaria in uno studio legale.

Passioni: dipingere, fare passeggiate, leggere

Situazione: Nina vive da sola. Il marito è deceduto qualche anno fa e i due figli abitano da molti anni fuori casa.

Rapporti con la famiglia: La signora Nina ha poche opportunità di vedere i suoi affetti, in particolare i nipoti. Il figlio Luca abita infatti all'estero e la figlia Giulia, anche se abita Materello, è sempre a lavoro. Spesso vengono a trovarla la domenica per pranzare e per passare il pomeriggio assieme.

Relazioni sociali: La vita sociale di Nina è abbastanza intensa. Nina frequenta il centro servizi dove segue i corsi di attività motoria. Inoltre una volta alla settimana frequenta l'Uteti. Tutte le sue amiche sono un po' lontane da lei e oltre che nelle occasioni "programmate" è difficile frequentarle e chiacchierare con loro.

Cosa vorrebbe: Alla signora Nina dispiace tantissimo non poter seguire la crescita e i primi passi del nipotino che vive all'estero e, allo stesso tempo, le piacerebbe avere la possibilità di vedere più spesso anche il nipote che sta a Trento.

Nina vorrebbe che le sue amiche fossero come vicine di casa per sentirsi più sicura, in compagnia, per parlare delle cose da fare, delle attività del centro e organizzare serate danzanti giù in città. Inoltre a Nina piace un sacco spettegolare e nelle attività programmate rimane poco tempo per parlare di cose altre.

Nina confessa di sentire gli anni che passano: vuole rimanere attiva ed ha bisogno di idee e stimoli riguardo ad attività da svolgere sia in casa che all'esterno.



The personas approach exploits vicarious learning to elicit users' feedback about technology without exposing them directly.

scenarios: the personas in action



It's snowing, and Nina can't go to the Third Age University...



... but she can still follow the broadcasted lesson..



... and she can talk with her friends there.



After the lesson, she talks with her grandson who lives in Canada and he shows her the photos of their holidays.



In the afternoon, the other grandson visits her and they sort out together some old pictures for his homework on the II World War.



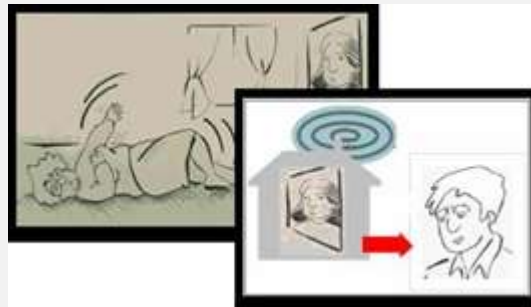
They then get in contact with Alberto, who tells them some stories about when he was a soldier.

1. Scenario presentation: the persona and the problematic situation are presented in the form of a video-clip



2. Participants discuss the plausibility of the presented situation and envisage eventual solutions

3. Technological scenario presentation: the role of technology in the given situations is shown in order to envisage pros and cons of the services



4. Evaluation of the specific functionalities through the usage of tokens. Each participant expresses his opinion for each of the functionality presented in the scenario

user & design requirements

Requirement #10	Motivation to go out and information about social events
Description	Provide stimulus to attend events and activities and promotion of human contact. Keep older people informed about social and cultural activities in the community.
Rationale	<p>It is important to promote the will and interest of the old person to meet people, maintain interest in activities, and confidence in moving outside home. This also promotes self-esteem.</p> <p>To be engaged in organized activities or social/cultural event is a wide spread need for older people, because of their necessity to feel active part of the community.</p>
Source of evidence	<p>Trento-stakeholders-interview-1 Trento-stakeholders-interview-2 Trento-stakeholders-interview-6 Trento-users-interview -1 Trento-users-focusgroup-1 Trento-users-focusgroup-6 Eindhoven-users-focusgroup-1 Eindhoven-stakeholders-focusgroup-1 Eindhoven-stakeholders-focusgroup-2 [Victor et al., 2003] [Bowling et al. 2002]</p>

Low-fi mocks up



Hi-fi mocks up

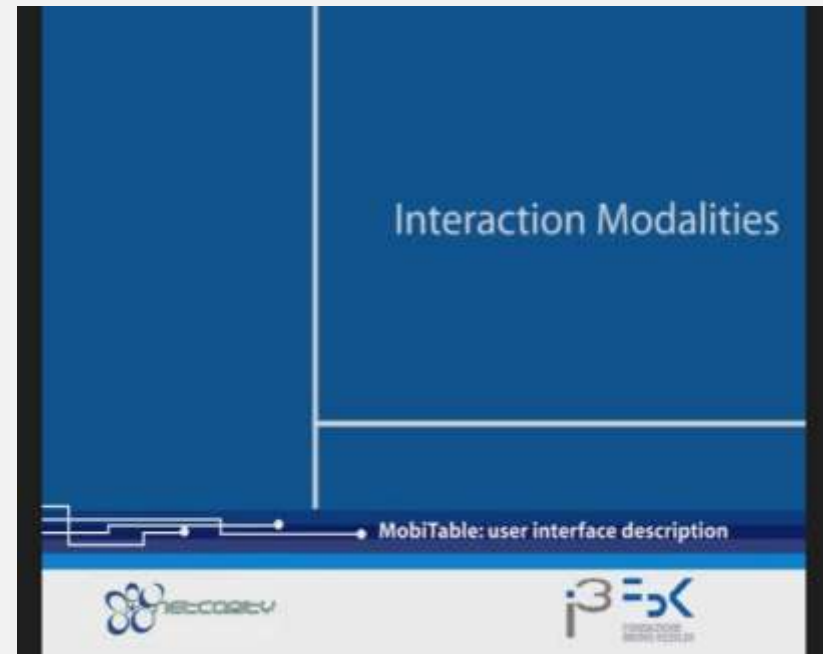


the final prototype: the MobiTable

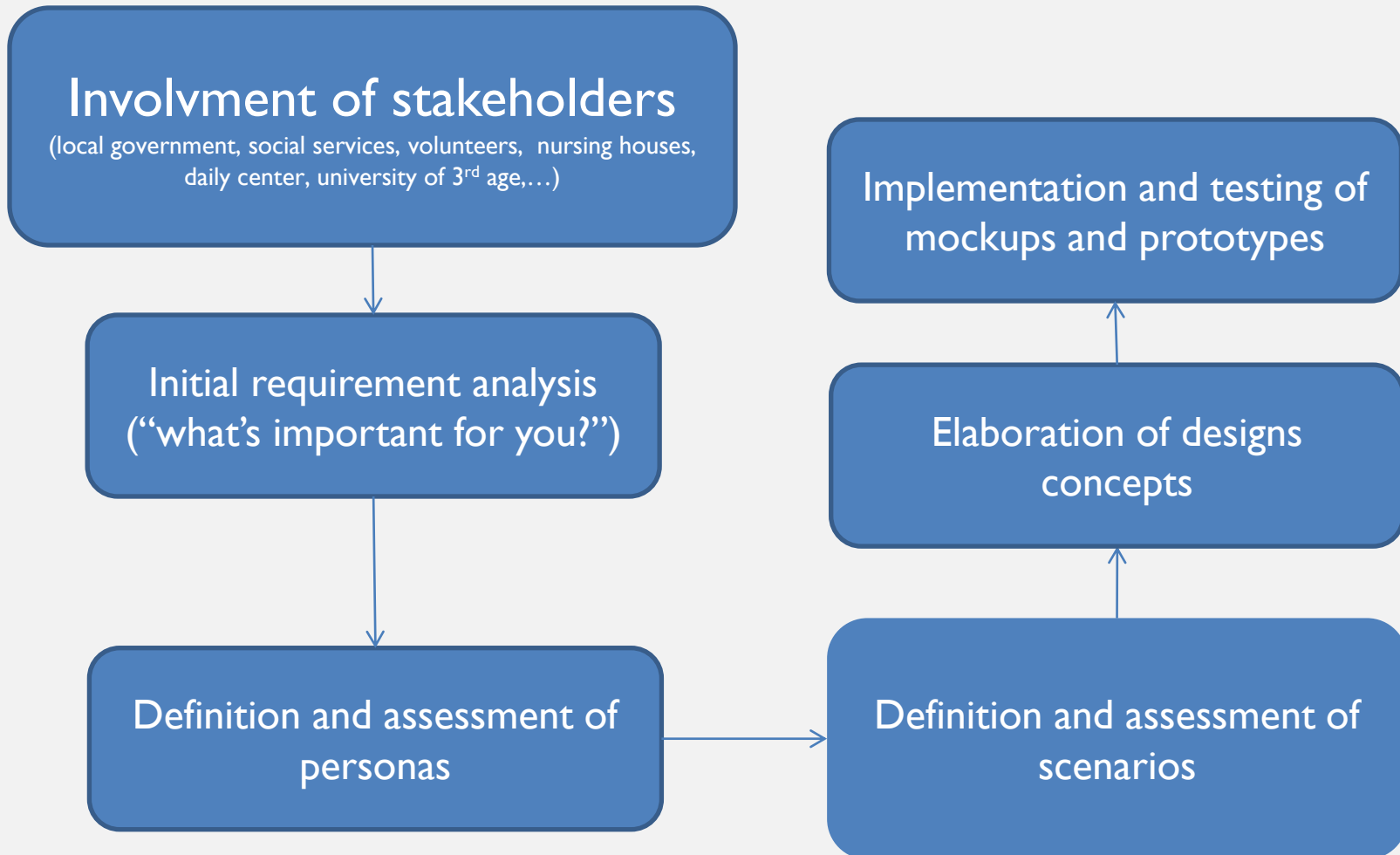
- the form follows the functions
 - email
 - video-conference
 - shared calendar
 - repository of digital resources



- the interaction paradigm includes
 - gestures to make more familiar the interaction
 - animations to improve understandability of system actions
 - ...
- Not a wow-effect but not either a “simpler” system



A year-long process



where's the meat?

- this talk is not really about technology for elderly
 - it's about a design methodology of working *with* users ...
 - ... to develop advanced technology *for* users
- a methodology to
 - involve users and stakeholders
 - elicit value-based requirements
 - support iterative development of the technology

- users' values matters as a whole and not only usability
 - from a business point of view (users are customers)
 - from an ethical point of view (digital divide may be dramatic in the context of FI)
- some techniques do exist
 - but a SE methodology has yet to be developed
 - it's a challenge for SE to build it

why is it important for us today?

- *Future Internet* will impact the future of several millions of people
- it cannot be only a matter of software but also
 - how software services become services to the *real* people
 - how technology should be designed to reduce digital divide