

Multimodal Interaction

Case Study – EU GUIDE Project

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Contents

- Scope
- User study
- Design
- Development

Scope

Users and new markets

Ageing-related impairme

Need for targeted services and adaptation, but limited technology and knowledge support for developers

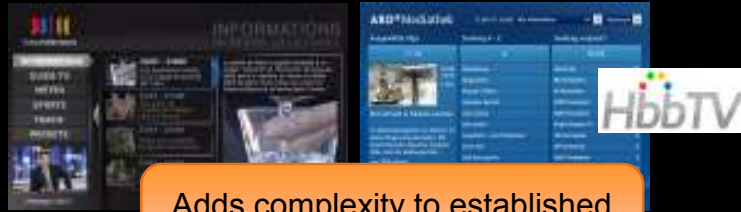
Companies already start to address needs of elderly society (→ "Senior TV"), but face lack of development support in addressing ageing-related issues.

New Business opportunities around „Senior TV“ services (© Copyright OceanBlueSoftware)

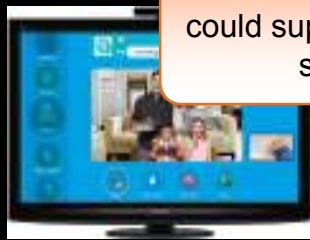
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Technical developments - Platforms



Adds complexity to established and accepted concepts, but could support services fostering social inclusion.



Video communication & social media

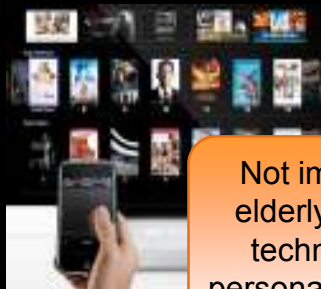


Apps on TV

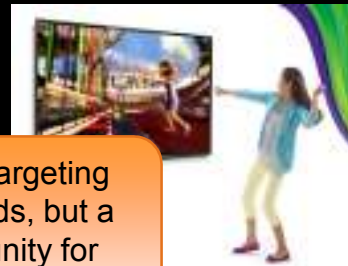
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Technical developments - Devices



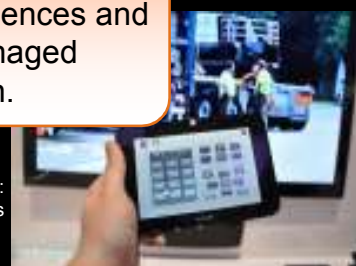
Integration of TV and mobile devices



Not immediately targeting elderly users' needs, but a technical opportunity for personalized experiences and support in managed interaction.



Sm

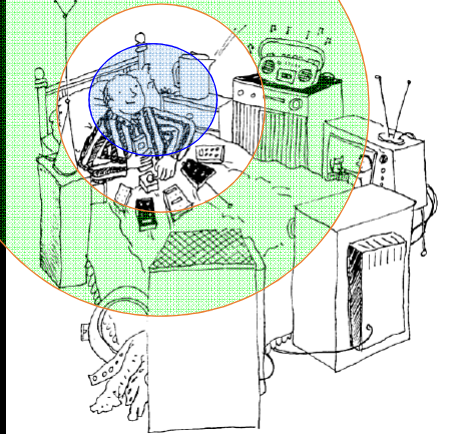


Second screen: Tablet PCs

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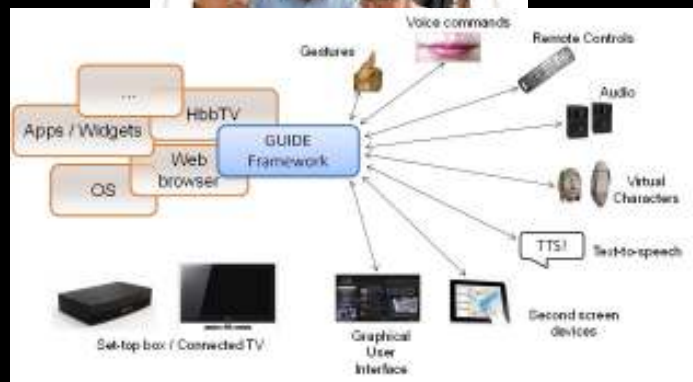
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Problem in accessibility



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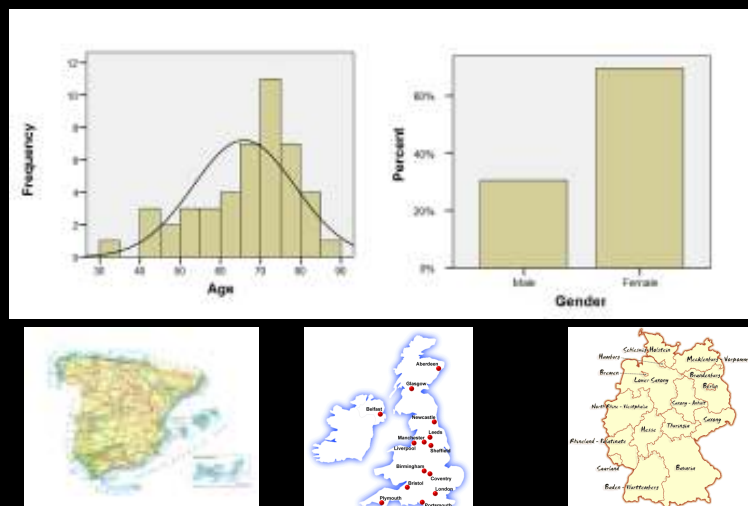
GUIDE objectives



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User Study

Users



Survey – Social status

- Education
- Profession
- Number of people living with

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Survey – Functional ability

- Contrast sensitivity
- Colour blindness
- Audiogram
- Digit symbol test
- Trail making test
- Grip strength
- Active range of motion of wrist

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Survey – Attitude towards technology

- I think that I need to use new technology
- I consider myself having the necessary skills to manage to use new technology tools
- I have problems to use these technologies properly even with practice
- The problems of technology devices are impossible to understand, so it is hard to find a solution
- When there is a problem with a new technology tool, it is because there is something wrong with that device
- I'm afraid to touch a new technology tool in case I'll break it
- I don't get advantage of using new technology tools
- I prefer to use an old fashion tool with fewer functions than a new one

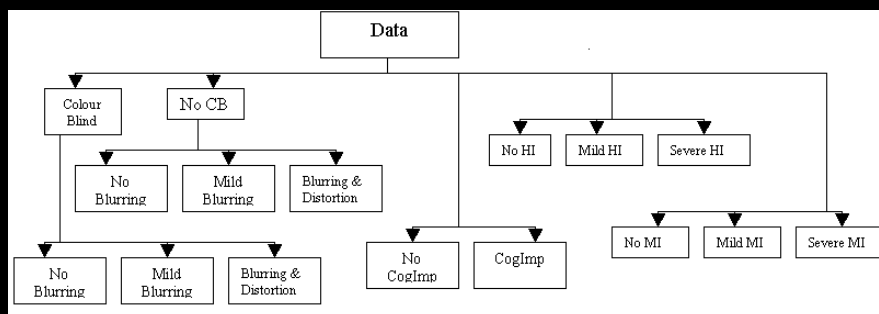
Agree

Disagree

Neutral

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Clusters



Interfaces can be optimized for different types of users

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Usability requirements

- Response time
- Screen layout
 - Home button
 - Home screen
- Help screen
- Interface personalization

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Personalization



One size fits all

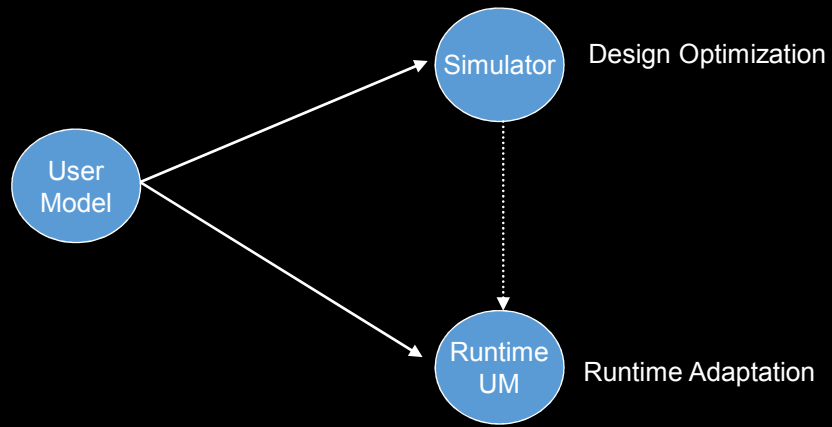


Individualization



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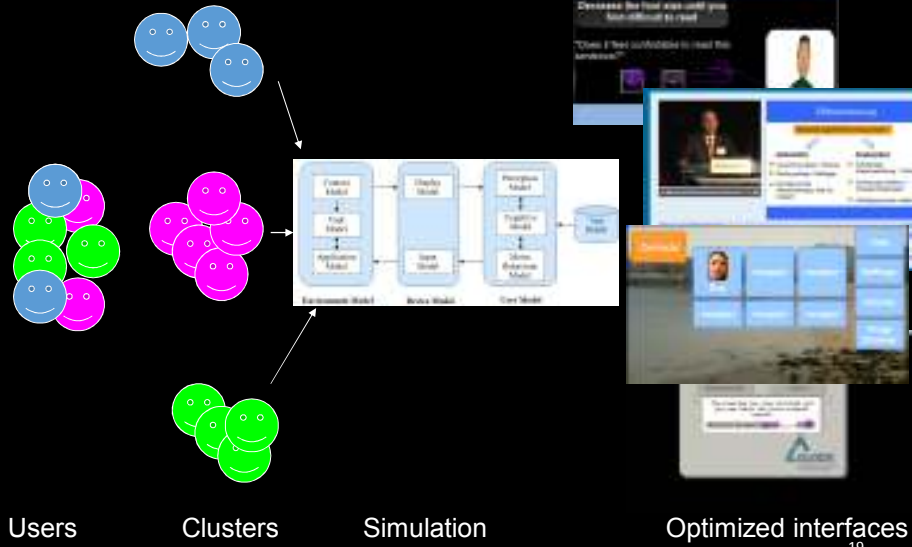
User Model



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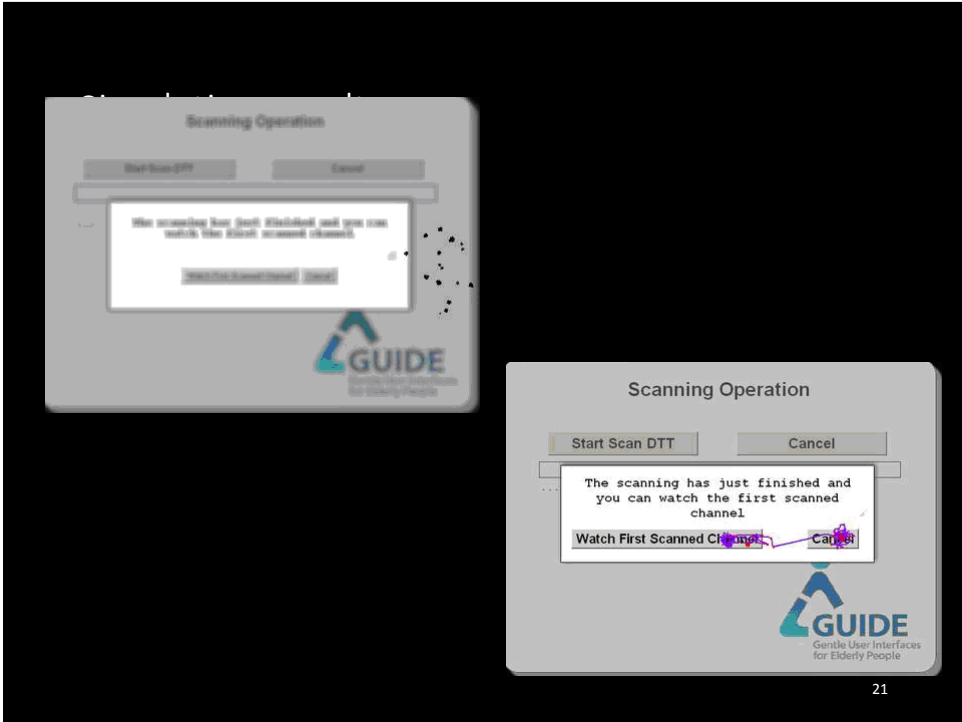
Design

User centred design process



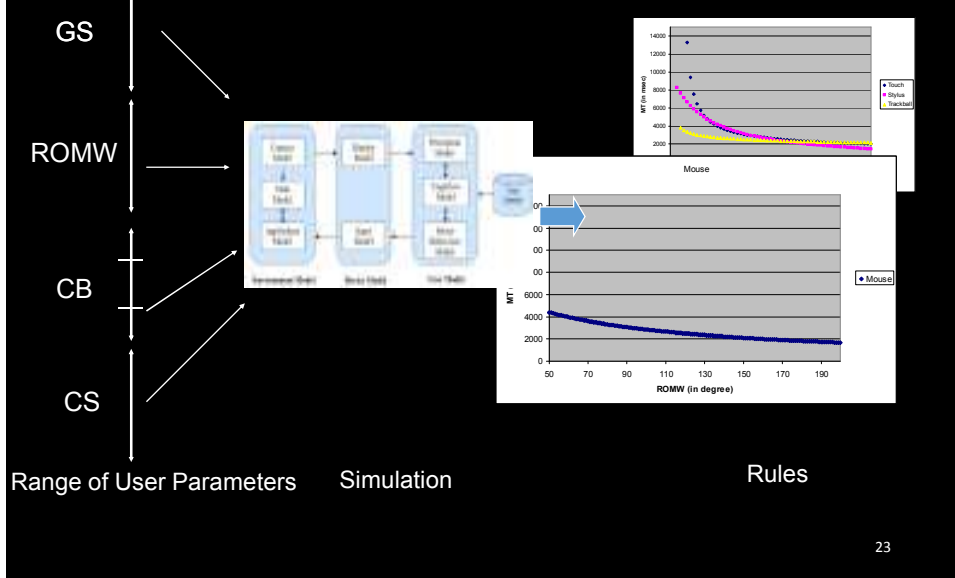
Simulation Example





Development

Developing runtime user model



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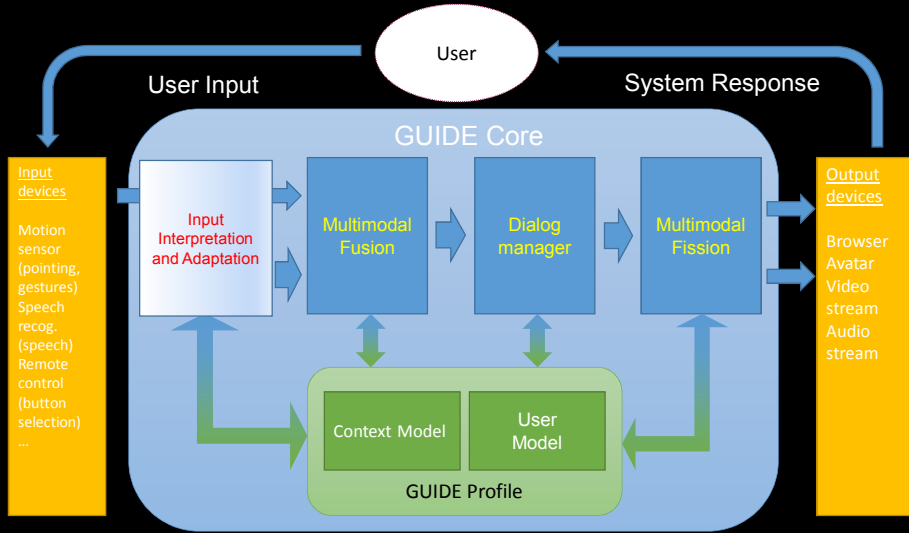
User model prediction

Profile Code	GS	Tremor	ROM W	Minimum Font Size	Colour Blindness	Adaptation	Predicted Best Modality	Colour Contrast	Button Spacing
	(in kg)		(in degree)	(in point)					
A	16	YES	71	14	Protanopia	Gravity Well	Pointing/Screen	Blue White	20*
B	25	NO	52	14	Protanopia	Damping	Pointing/Gesture/ Screen	Blue White	20
C	59	NO	66	12	Deuteranopia	Damping	Pointing/Gesture/ Screen	Blue White	20
D	59	NO	66	0	N/A	Damping	Speech/Audio	N/A	20
E	25	YES	52	14	None	Gravity Well	Pointing/Screen	Any	20
F	59	NO	120	14	Tritanopia	Damping	Pointing/Gesture/ Screen	White Black	5*
G	9	NO	63	14	None	Gravity Well	Pointing/Screen	Any	20

*20 means: 0.2 * distance of target from centre of screen
5 means: 0.05 * length of diagonal of the screen

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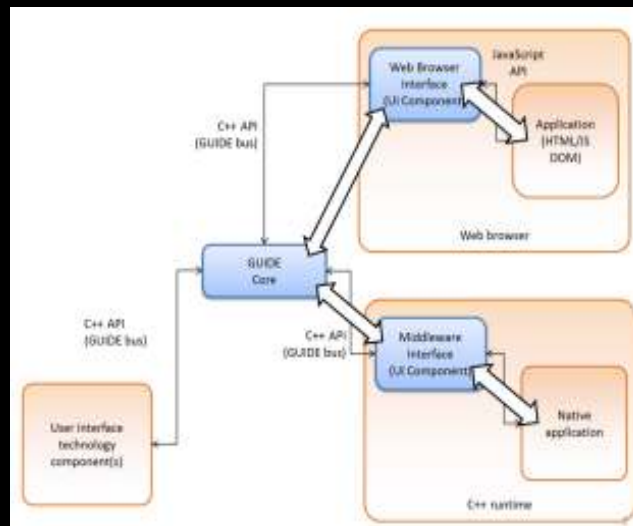
Multimodal adaptation



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Framework application interface



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Personalized Interfaces



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New Interaction Technologies



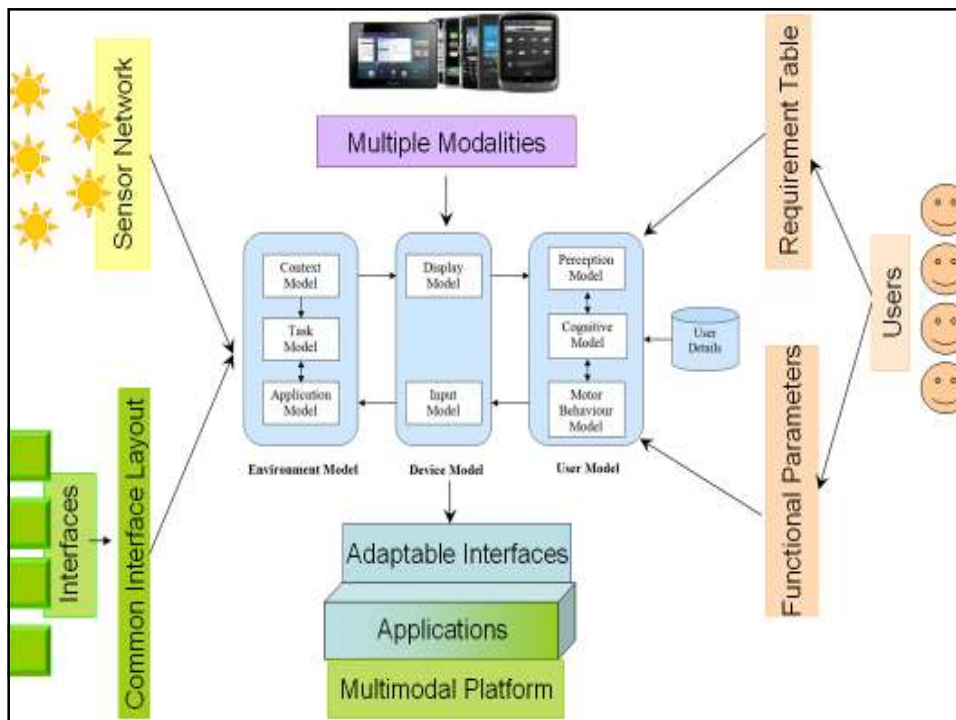
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Demonstration



GUIDE supports HTML5 web applications

More information on the GUIDE Open Source Software Framework: www.guide-project.eu



Take away points

- Lifecycle of a project
 - User study → Design → Development
 - Validation will be discussed in next session
- Practical use of user modelling
- Multimodal interaction
- Interface personalization