Assistive Technologies
Part 2

How can advances in Technology assist user needs?

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Technology as an Enabler?

'Emerging' Technology

- **Push Effect**: High risk enabling new solutions
- **Pull Effect**: Driven by user requirements and mature solutions

New Technology

Meeting user needs

'Everyday' Technology

Research

New Applications
Key Challenges to address

• Developing a system that the user wants (in conjunction with a good understanding of problem domain).

• Developing the solution which is scalable and interoperable with existing practice.

• To provide choice for the user.

• To adapt to the user’s changing needs and behaviour.
Case Study 2

The use of emerging healthcare technologies
Areas of Cognitive Reinforcement

- CogKnow aims to:
  - help ageing people with early dementia to experience greater autonomy and feelings of empowerment, and to enjoy an enhanced quality of life.
- We are aiming to address cognitive reinforcement in four main areas according to the needs identified by dementia sufferers and their carers (Droes, 2006).

Reference: Van der Roest et al. International Psychogeriatrics, 2007 (FRUX-project)
Assessment of impact on technology

Research Questions of Usability and Usefulness of Prototype

Technical Development
Field Trial #1 and Evaluation

Research Questions of Impact on Quality of Life

Refine Technical Development
Field Trial #2 and Evaluation

Research Questions of Impact of technological support for persons with mild dementia

Final Technical Development
Field Trial #3 and Evaluation

Current stage of Project

Results from Field Trial #1 to inform 2nd stage of Technical Development

Results from Field Trial #2 to inform 3rd stage of Technical Development
CogKnow – Version 1 Prototype

Helping to remember

Help

Find

Tuesday 16th October 2007
14:34 afternoon
Day Navigator

Phone

Music

Radio

Enhanced feelings of safety

Maintaining social contact

Perform daily life activities
Evaluation of technology

- System has been evaluated with two cohorts of users.
  - Field Trial #1 – 16 users (June-August 2008)
    - 1 day trial per person
  - Field Trial #2 – 13 users (June-September 2009)
    - 7 day trial per person

- Feedback used to refine development process.
- Main findings
  - Requires further degree of service provision
  - Requires a degree of personalisation
  - Requires improved technical stability
  - Reduction in technical complexity of use.
## System Evaluation

<table>
<thead>
<tr>
<th></th>
<th><strong>Human factor impact</strong></th>
<th><strong>Technical impact</strong></th>
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<tbody>
<tr>
<td><strong>Overall system</strong></td>
<td>Useful, easy to operate, easy to understand, Interaction with touch screen was problematic</td>
<td>Problem with sensitivity of touch screen, Cogknow server reliable, stationary device stable, mobile device not stable nor reliable</td>
</tr>
<tr>
<td><strong>Reminding</strong></td>
<td>Reminders where not attuned to personal situation and therefore not always useful, Reminders on mobile too small,</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>Picture dialing very useful, But too many steps,</td>
<td>Picture dialing was not reliable on mobile device</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Valued high, easy, Music was not attuned to personal preferences</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Could not be tested properly on all sites. Is expected to be useful in the future</td>
<td>The door sensor was not reliable on all sites and had integration problems with the system</td>
</tr>
</tbody>
</table>
Personalisation of service delivery

Personalisation of services

Personalisation of reminders
Technological Support – User Interface Level

Main menu

Schedule

Reminders

Social Contacts
Technological Support – Decision support Level
The way ahead

2. Multiple Occupancy

1. Sensor Reliability (Trust)

3. Data Storage and Exchange
Summary

• Although a lot of effort has been focused in this area, only small scale deployment and proof of concept systems are in existence.
• In addition, solutions have been stand alone and non interoperable.
• New Business Models are required.
• **Increase functionality, decrease issues surrounding usability.**
• Efforts should be directed towards:
  – Understanding the real needs of users
  – Developing personalised and adaptive solutions
  – Managing practical issues of technology failure
  – Integration with existing healthcare practice
  – Validating technology with larger cohorts
  – Streamline the installation process
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