SMART homes: emerging technologies

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Telecare

- Sensors
- Telephone

Care staff or Call Centre
Smart home

- Computer
- Communication bus
- Sensors
- Support devices

Care staff or outside help
User behaviour

Get out of bed at night

Move towards toilet

Come out of toilet

Get back into bed

House reaction

Bedroom light fade on

Toilet light on, bedroom light faded down

Toilet light off, bedroom light faded up

Bedroom light fades off after 3 mins

Bed occupancy sensor

PIR

PIR

Bed occupancy sensor
**User behaviour**

- Get out of bed at night
  - Bed occupancy sensor
  - Light fade on

- Wander for a while
  - PIR
  - No action

- Wander for >5 minutes
  - PIR
  - Verbal prompt about going back to bed

- Get back into bed
  - Bed occupancy sensor
  - Light fades off after 3 mins

- Still wandering after 5 mins
  - PIR
  - Care staff alerted
Bed occupancy sensor

Lighting control

Movement sensing

Call care staff

Restless at night

Door wander monitor

Gone outside

Had to turn off

Tap usage monitor

Cooker monitor
Hard-wired communication bus

Communication bus

Sensor

Support device

Sensor

Support device

Computer
Radio communication bus

Radio module

- Computer
- Sensor
- Support device
- Support device
But what then........
Identifying solutions → Themes
Identifying opportunities → Wish list
Identifying solutions → Technology list
Prioritising developments → Design list
- identity and personal history
- enabling relationships
- encouraging social engagement
- conversation prompting
- music
- supporting activity sequences
- access to nature
- creative activities
1. Music (easy access)

2. Encouraging social engagement (window on the world)

3. Conversation prompting

4. Supporting activity sequences
Easy access to music
Sessions in care homes
• Is the operation obvious?

• Does it look like it should play music?

• Do users do anything unexpected?

• Etc
Simple Music Player III

- Raised touch sensor
- Brighter LEDs
- Better Diffuser
Window on the world
Person with dementia interface

House of person with dementia

‘Can I come in’

Carer interface

Allow inside

‘Time to go now’

House of family carer

TV with webcam

Interface

Internet
• Technology identified for up to 5k range
• Many webcams found for local scenes
• Tests in care homes with group of users
• Able to recognise the view
• Found to be engaging, despite little action
Conversation prompter
"Dinner was nice. We had chicken and potatoes and I.......?"

"Help me" button

Last few words replayed

Reminder about topic
Intercom link

‘Help me’ button

Intercom link
Tape loop

Speech

Lost train of thought

Replay
Tape loop

Speech

Lost train of thought

Replay

Decide to press ‘help me’ button
Solid state recording

Speech

Lost train of thought

Decide to press ‘help me’ button

Replay
Scheduling support
eg Making a cup of tea

1. Fill kettle with water
2. Put kettle on cooker
3. Put tea in pot

Food preparation
Dressing
Gardening

etc
1. Prompt

2. Monitor

- Verbal prompt
- Picture prompt
- Spotlight, indicator
- Sounder in object
- User action (button press)
- Video monitoring
- Active enquiry (have you done that?)
1. Work with personal carers to explore their strategies

2. Wizard-of-Oz studies

Person with dementia in, for example, the kitchen

Researcher in adjacent room

Intercom link
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