User Driven Development: UK Funding Mechanisms and Examples

Dr. Richard Curry

Senior Scientific Advisor, DH R&D Programme

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Terminology

• Users
  ➢ professionals,
  ➢ patients (clients),
  ➢ public (consumers)

• User-Inventor
## Development Landscape

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lone Developer</td>
<td>1900</td>
<td>Edison</td>
</tr>
<tr>
<td>Campus Developer</td>
<td>1950</td>
<td>Xerox Park</td>
</tr>
<tr>
<td>Networked Developer</td>
<td>2000</td>
<td>Open source</td>
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</tbody>
</table>
Policy Makers
Knowledge of user led developments creates more relevant policy

Policy Makers
Knowledge of industrial capability informs policy development

Users

Industry
Knowledge of user needs creates market pull not technology push

TRIUMVIRATE
Ambient Assisted Living

- AAL is the use of information and communication and sensor technologies to deliver health and social support to people to help them live as independently as possible in the lowest intensity care setting consistent with their needs and wishes.
- Socio-technical development ranging from stand-alone assistive technology to complex remote physiological monitoring.
Development Mechanisms

Networks

1. Strong
   professionals, patients, carers

2. Weak
   Healthcare Technology Co-operatives, Medilinks
Development Mechanisms

Funding

1. Invention for Innovation – response mode
2. Assisted Living Innovation Platform – thematic
3. Small Business Research Initiative – specification led
Issues

• Organisational
  ➢ Aligning needs and benefits of stakeholders
  ➢ Development culture

• Informed users
  ➢ Articulate, technologically literate, team players
Two examples

Two groups that got it right!

• Speech-driven environmental control systems (SPECS)

• Robot assisted upper limb exercise following stroke (i-PAM)
SPECS Aim

The target product is a fully functional prototype home control system, driven by voice and outputting signals to control the home.

- Allow users to develop their own individual word recognisers
- The facility to configure the system to control many devices
SPECS Partners

Clinical engagement, user needs and assistive technology

Speech technology and speech pathology

Assistive technology development, manufacture and sales

Speech recognition applications and hardware

Health-related innovation and intellectual property
User-centred development

User requirements

Prototype 1

User trial

Prototype 2

User trial

. . . . .

Final user trial
i-PAM Aims

Restoring functional loss
– Restorative rehabilitation treatment is about RELEARNING activities / skills
  • e.g. motor, cognitive

Compensating for functional loss
– “Adaptive” interventions to allow people to be independent when full recovery does not occur
Development of an intelligent robotic system to assist people with stroke undertake active upper limb exercise

Bipin Bhakta
Faculty of Medicine and Health
University of Leeds, Leeds THT

Alastair Cozens
NHS Grampian, Aberdeen

Sophie Makower, Jane Savage
Community Rehabilitation Unit, Leeds PCT

Rehabilitation Technology Users Group
Yorkshire

Martin Levesley
Andrew Jackson
Peter Culmer
Robert Richardson
Ray Holt
School of Mechanical Engineering
University of Leeds

Mark Mon Williams
School of Psychology
University of Aberdeen
User involvement

• Prior to project the Rehabilitation Technologies User Group (RTUG) was formed
  – people with stroke, carers
  – health professionals

• RTUG were involved in the project management team meetings

• RTUG provided guidance on a number of design issues
  – ability of robot to provide the range of movement necessary for appropriate arm exercises
  – comfort of the interface between the patient's arm
  – comfort during arm movement.
Getting the mechanical configuration right
iPAM in action
Summary

- AAL service development is a complex socio-technical undertaking
- All stakeholders are “users”
- Networked development – the right multidisciplinary group