

Barnsley Assistive Technology Team

User Requirements of EC

(Should there be a minimum specification for environmental control equipment and what should it be?)

- Background
- User Requirements
 - Example of user requirements – VOCAs and EC
- User Requirements of EC?
- Practicalities

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Background

Background :: Initial EC Paradigm

- Designed for specific client group/environment
- Centrally specified, commissioned, administered
- Centralised criteria (The Yellow Book)
- ‘Assessment and prescription’
- Relatively ‘fixed’ and minimal choice



Background :: EC Evolution



FIG. 3
First general-purpose control console with indicator and load-opening telephone.



- Between then and now, we have seen come and go:
 - National evaluation of equipment
 - PASA
 - Co-ordination/mapping of EC services
 - Central purchasing tenders
 - Tender functional specifications
 - 3 or 4 generations of equipment

Background :: Current picture

- Wider range of equipment (? Functions)
- Competition between two or three suppliers to develop products/supply services
- Central tender/contract with minimal functional specification.
- No evaluation
- No agreed device requirements or specification
- No co-ordination between services

- (R)Evolution towards:
 - Home automation & assisted living
 - Mainstream platforms
- NHS structural changes

- How do we ensure good design appropriate for our client group?
- How do we manage the evolution into home automation?
- How do we evaluate equipment?

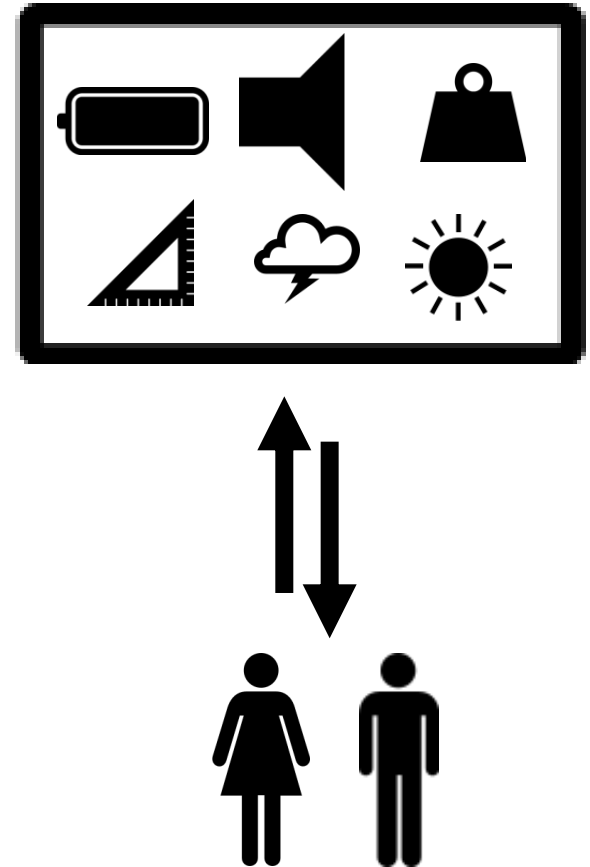
Concentrate on user requirements?

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User Requirements

User Requirements :: In Context

- User Requirements
- Specification
(Use case)
- Device design
(User Involvement)
- Device evaluation
- Device choice / decision making
- Device purchasing



User Requirements Example :: VOCAs

Device Design Features of the way the device is made	Wider Picture Effect of different aspects of the environment	Context The personal context of device use
Ease of use	Effect of slowed speed of communication	Motivation and reasoning around use of aided communication
Effect of good and bad device design	Impact of training and learning	Addressing communication breakdown through communication aid use
How a device is made	Help and Support	Context of current use of aided communication
Device reliability	Influence of AAC service delivery	Experience of other forms of technology
Device performance	Restricted use of communication aid	Environments
Physical characteristics	Support of aided communication within immediate environments	Control
Physical environment and transport		
Design and layout		
Device configuration		
Voice output		
Questionnaire Data	Interview Data	

User Requirements Example :: VOCAs :: Device Design

Device Design

Features of the way the device is made

Ease of use

Effect of good and bad device design

How a device is made

Device reliability

Device performance

Physical characteristics

Physical environment and transport

Design and layout

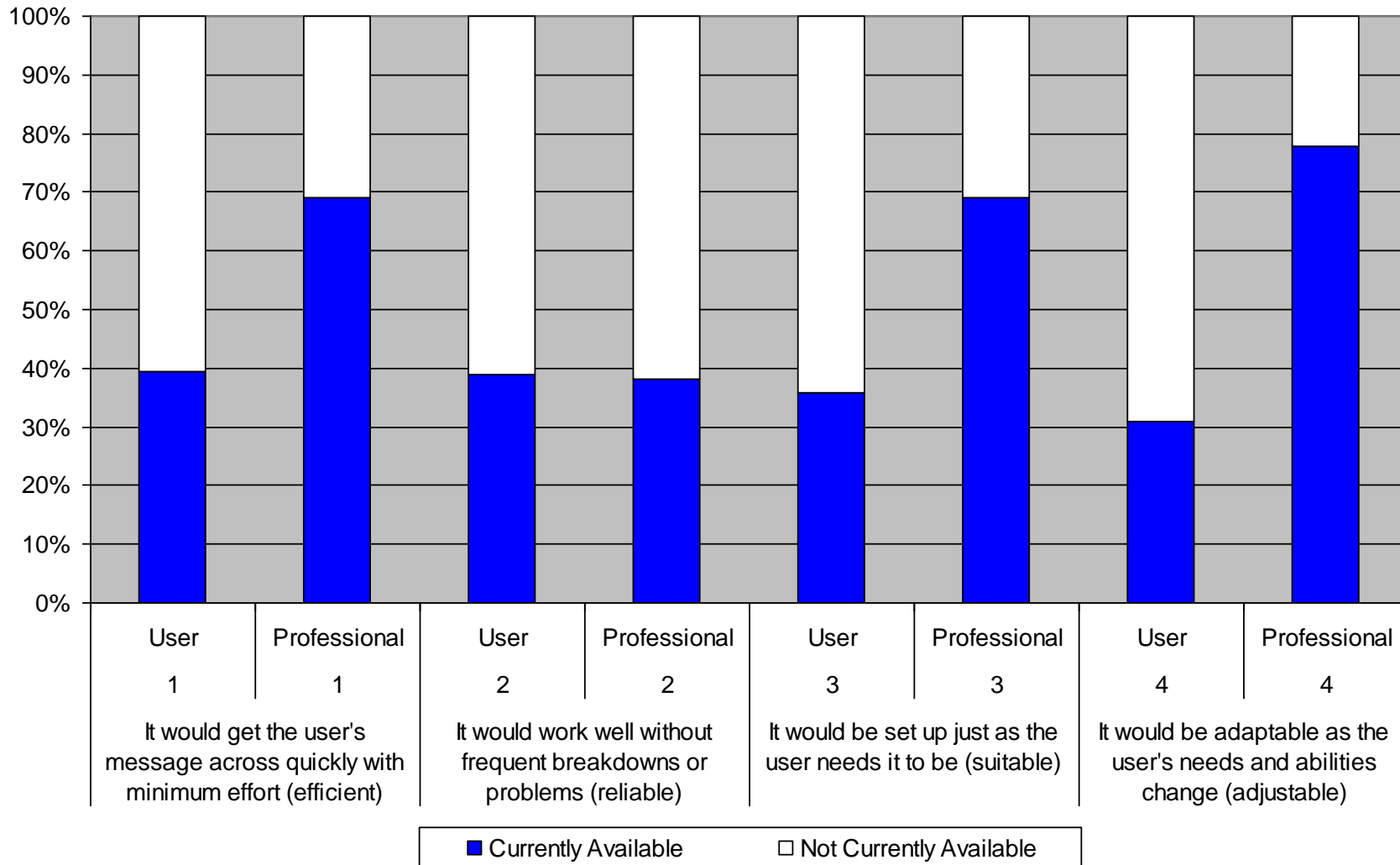
Device configuration

Voice output

User Requirements Example :: VOCAs :: Device Design

- Specific features of device design were often referred to
- Current devices are not considered reliable or durable
- Device performance considered lacking – e.g. being ready to use quickly, battery life.

User Requirements Example :: VOCAs :: Device Design :: Ease of Use



User Requirements Example :: VOCAs :: Device Design :: Reliability

6 CP *Actually you've just been without your communication aid haven't you for four or five weeks. You might want to tell (Interviewer) what you thought or how you felt when you didn't have it. How did you feel every day coming into college without your communication aid? So remember, we were asking you how you felt so you need to say 'I..' That's 'like', is that what you're after or are you looking for 'feel'? It's under your verbs I think. Feel's over there.*

CA *Feel.*

CP *If it's in the past you might want to say 'I felt' so you'll need to – yeah.*

CA *Felt.*

CP *You just say how you felt with no communication aid. There's no right or wrong answer, it's just what you feel.*

CA *Angry.*

User Requirements Example :: Device Design :: Physical Characteristics

- During the interviews, a large number of specific design/physical characteristics emerged:
 - Batteries, Design and aesthetics, Display, Mounting, Ruggedness, Size, Weight, Transportation, Use outdoors

14 *I what do you think makes for a successful communication aid? So you've obviously got a comparison that you can make between the three, or five.*

CA [silence] The battery life, the chargeability.

User Requirements Example :: VOCAs

- Large interest from industry – demonstrated potential to drive innovation through better understanding of user requirements.
- Also considered as basis for potential decision support tool.

User Requirements Example :: (Speech Driven) EC

- Hardware
 - Problems with batteries and IR

"so it's pointing in that direction and that makes it operate everything in an arc of about 40 degrees. I'm not quite sure what the arc is. The usual problem is if you get something like a cable or if somebody's knee is in front of it."

- Difficulty of training new functions
- Importance of Aesthetics

User Requirements Example :: (Speech Driven) EC

■ Access

- Non speech backup for some functions

"they've both got their benefits and they've both got the pitfalls, but together they're good"

- Find scanning systems slow

"you have to think where things were and it goes beep, beep, beep stop that then, and then beep, beep, beep and if you want to make a phone call, oh God they were terrible. Beep, beep, beep and you'd have to find the number and you look for the number and you stop it then you go somewhere and it goes sideways and I think 'argh!'"

- Cognitive ability

User Requirements Example :: (Speech Driven) EC

■ Training

- Lack of training & learning the operation of the device

"It just said if you have any further problems we'll send you out written instructions. I'm sorry, I'm paraplegic, I can't hold instructions and I can't programme things anymore. My carer was struggling."

- User Training
- Carers

User Requirements Example :: (Speech Driven) EC

- Why it is important
 - Gives Independence

"I can open and shut a curtain, if I want to look at the moon I can do, if I want some fresh air in the room I can open the window, I can put my heater on if I get a bit cold, so it has made a big difference to my role in the house on my own."

- Reduces load on carers

"I mean it's not just frustrating for me not being able to do it, it gets frustrating for my husband, when he's in the middle of cooking a meal and I'm saying "X can you come and put me this on, can you come and do my back" anything like that that saves him, you know, is brilliant."

User Requirements Example :: (Speech Driven) EC

- Aspirations
 - Desire for an inspirational and future looking device that is comparable or ahead of mainstream development
 - Reasonable price, high reliability, intuitive to use, utilising current technology (e.g. PDAs, Bluetooth)
 - Increased customisability

User Requirements Example :: (Speech Driven) EC

- Aspirations
 - Ease of use

"we were talking about one, it was difficult to program and that clearly makes a difference so ease of programming is something that is a problem."

- Feedback

"I'm interested in this alternative display technology like you were saying, you should be able to interact with your high definition television or something or you can buy these little digital photo frames that are an alternative way of displaying information.

A picture of your mother-in-law."

- Hardware
 - mounting; battery life; low battery indication; size; aesthetic appearance; ruggedness; output; incorporating mobile technology

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EC User Requirements

EC User Requirements :: Fundamental eAT User Requirements

- Commonalities in D4D and SPECS around ‘fundamental’ user requirements:
 - Reliability
 - Ease of use
 - Physical characteristics (batteries etc)

EC User Requirements :: Current EC

- Designed for WHO?
 - Range of users expanded, but devices meeting initial specification...
- What functional differences since the 1960s?
 - E.g. what different access methods?
- Are we being offered devices that are fit for purpose?
 - Examples – to highlight potential user requirement clashes

EC User Requirements :: Example – Steeper EvoAssist

- What?
 - EC on iPad platform
- Who?
 - Ambulant user
 - **Switch user?**
- Issues?
 - Home or off button stops switch user controlling EC
(RELIABILITY)
 - Only EC switch accessible
(DEVICE PERFORMANCE)

EC User Requirements :: Example – Possum Vivo

- What?
 - Comprehensive EC device
- Who?
 - Switch user
 - Visual impairment
 - Cognitive impairment
- Issues
 - Setup 'too complex' for service without ?2 day training
 - Limits opportunity to trial
(ASSESSMENT)
 - Unable to setup global parameters for font/colour scheme etc.
(USABILITY)

EC User Requirements :: Example - Omni

■ What

- Touchscreen controller with mobile phone built in

■ Who

- Ambulant
- Switch user?
- Phone user?

■ Issues

- Need to wear a headset to use phone (be able to put it on)
(USABILITY)

Summary & Future?

- User requirements not ‘ingrained’ in current devices?
- Provided examples of how user requirements work can provide useful information and a framework.
- National evaluation/specification unlikely.
- How to develop requirements and evaluation?
 - ‘Crowd Sourcing’ User Requirements and evaluations?