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# *This is a precis of the following paper : How individual should digital AT user interfaces be for people with dementia*

Peter Cudd<sup>a,1</sup>, Philippa Greasley<sup>a</sup>, Zoe Gallant<sup>a</sup>, Emily Bolton<sup>a</sup> and Gail Mountain<sup>a</sup>

<sup>a</sup>School of Health and Related Research, University of Sheffield, UK

**Abstract.** A literature review of digital technology user interface design for people with dementia is reported. Twenty four papers were analysed in detail. The following recommendations are made : improvement in reporting details of studies; researchers should consider the population of people with dementia as heterogeneous; that interfaces be designed for functionally similar sub-groups thus establishing a sequence of 'stepping stones' that better address functional capability as it changes.

**Keywords.** dementia, alzheimer's, design, information, communication, assistive, technology, software

## **Introduction**

The growing need to support independent living of people living with dementia in a cost effective way through digital technology is stated. The issue of heterogeneity of people living with dementia is raised in terms of how this impacts design of digital AT and associated services. The questions raised by the latter issue are addressed through examining the literature of studies that have involved people living with dementia in developing or evaluating technology designed for their use. Added to this are papers that make a theoretical view from knowledge of people with dementia. Three most common types of dementia and the associated symptoms are described. It is noted that these have a functional interpretation of diagnoses that emphasizes similarity. In contrast the social model is stated to produce a view that suggests individual requirements and solutions. It is stated that validated assessment tools for use for digital interactive AT do not exist. The Mini Mental State Exam is discussed and despite shortcomings often is used to identify cognitive impairments - but it is noted this is not assessment for use of interactive AT.

## **Methodology**

Baseline state of the art was established through searching the literature of the last 10 years. However consultation with local people living with dementia and their carers were added.

The restricted literature review was conducted employing a narrative synthesis and many systematic review methods. A table summarises the main characteristics of the literature search. Local people living with dementia were a consultative extension to the research team – it is noted that they were never expected to be representative of all people living with dementia.

## **Results**

A table summarises the main characteristics of the literature search. The search resulted in 612 different articles, after title and abstract filtering only 41 remained. In the end only 24

aimed at people living with dementia as direct users. These articles were not homogeneous in all regards: 14 articles were based in dementia day services; approximately one third of the sample involved each of non-portable touchscreen, portable touchscreen or other user interfacing; and, the purpose of the technologies was highly varied.

Almost all the literature found, as written, is poorly defined and with weak evaluations to permit generalization. Examples include: N is usually less than 20; convenience sampling was employed; only 4 studies appear to have characterized the sample - through MMSE. A table summarises 6 specific examples.

## Consultation of people living with dementia

The consultation with people with early onset dementia demonstrated shared desires and individualistic ones. Perhaps for the first time it is reported that people with dementia were happy and preferred use of computers and associated terminology respectively. In ways of categorising music and response to an advocacy service there were differences, indeed each individual had some particular preference for specific content.

## **Discussion**

### Quality and strength of reported evidence

Despite their inherent value as apparent state of the art designs of digital AT for people living with dementia strictly applying hierarchies of research evidence leads to the finding that there is low strength and quality. This is evidenced by: inferred results only being self-consistent and not offering generalizability; convenience sampling was almost always employed; poorly described support needed from carers; more attention paid to participatory research rather than user interface feature specification or choice. It is acknowledged that it is currently difficult to measure benefit, independence and carer loading, as well as that other literature might offer better evidence.

### Implications from considerations of people with dementia

Heterogeneity intra and inter populations of people with dementias and their age peers without dementia are highlighted. It is noted that perhaps the former have greater variation because of the additional disease associated functional changes. Therefore, adaptive bespoke AT solutions could be the inferred goal. A design for all compatible strategy is suggested as one approach. This would design for sub-populations. Future research is required to identify these groups to match to relevant sub-group user interfacing, the users' ability to learn also needs to be considered in this.

## **Conclusions**

It is concluded from the heterogeneity of the whole population of people with dementia that it is inappropriate to consider them as a population with an entirely shared single set of requirements. It is stated that research into designing for sub-populations who do share similar user interface requirements is desirable. Furthermore it is suggested that current and future studies need to report much more information to make real learning in design to occur.

## **References**

There are 34 references

<sup>1</sup> Correspondence to : p.cudd@sheffield.ac.uk