Differing perspectives on a role for technology in care homes to improve the lives of older people and the work environment of staff

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Title: 'Differing perspectives on a role for technology in care homes - to improve the lives of older people and the work environment of staff.'

Title

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ABSTRACT

This paper explores diversity within the care home sector as a context for the development of technology and design to improve residents' lives and the work environment of the staff who care for them. The findings from a learning exercise with care home staff serve to illustrate the meaning that staff, residents and relatives attach to a care home as a 'home' and suggest that between these groups there are subtle and sometimes competing differences. These, when combined with the increased age of residents on admission, their likelihood of having several co-existing disablements, and a care-giving culture that is often more reactive than proactive, present care home reality as a complex scenario. Thus, the development of technology and design for care homes should not be a simple extension of what has been used in other types of institutional settings; rather it should start through dialogue with those who visit, or who work, or who live in these homes to identify what is useful to meet their respective needs.

Purpose of this paper	To place the development of technology within the reality of the diversity of care homes
Design/methodology/approach	Using the findings from a learning exercise, we illustrate 'diversity' in the meaning staff, relatives and residents attached to the words 'care home'. This provides a basis for exploring types of technology that could, if appropriately introduced, prove to be of benefit.
Findings	We take a pragmatic stance that that if due care is taken in preparations for and the introduction of technology, this would increase uptake.
Research limitations/implications (if	
Practical implications *(if applicable)*	Technology is more likely to be 'fit for purpose' when it has been developed with those who work, live in, and who visit care homes. Cost and benefit will be issues to be taken into account.
Social implications (if applicable)	The paper makes the points that ➢ Older people can learn new technological skills; ➢ The concept of care homes as user-led is in accord with increased opportunity to engage residents n new technology ➢ Technology in care homes while posing challenges also could be a major lucrative market How will it influence (corporate) social responsibility or environmental issues? How could human resource intensive it inform public or industry policy? Triangulation of diff needs /perspectives
What is original/value of paper	.

TITLE: Finding a role for technology to improve the lives of older people and the work environment of staff in the complex and diverse sector of care homes.

INTRODUCTION

Using figures from the Care Quality Commission (2010), the British Geriatrics Society (2011) reported that over 18,000 care homes provide places for more than 440,000 older clients; with a majority in residential homes offering personal care only as opposed to nursing homes with 24/7 nursing. Out of every 1,000 care homes, 730 are privately owned, 140 are voluntary, 110 are local authority owned, and the remaining 20 are NHS [mainly continuing care] or 'other owner' homes (Care Quality Commission, 2010). A recent press release by Laing and Buisson (2013) reports that currently 43% of older residents meet their care home costs themselves. Of the remainder, 14% are part-funded by family and friends as top ups to council funding, and 43% are totally council or NHS funded. This situation represents a record high level for the numbers of older people paying all or part of the cost of their care. It can therefore be argued that as older residents' status as consumers and purchasers of long-term care services, so too will their (and including relatives) expectation of access to up-to-date technology.

Understanding the needs of older residents in care homes is of paramount importance for future design and technology development. The impairments of late life have been aptly described by Isaacs (1992) as the 'Giants of Geriatric Medicine': incontinence, impaired mobility, impaired stability and falls, sensory loss, and impaired mental performance, to which can be added pain and insecurity. The extent of disablement has been described in a recent census undertaken by a major care home provider as: three-quarters of the residents required the assistance of another or were totally dependent upon staff for mobility; 72% were incontinent and 64% were confused or forgetful; with the proportion of residents admitted for reasons of dementia being just under 46% (Centre for Policy on Aging, 2012). These disablements rarely occur in isolation and the resulting complexity is challenging and time consuming for

care staff. Although residential homes have historically catered for less dependent older people than nursing homes, a 'considerable overlap' in dependency and nursing care needs between the two types of home has emerged (Bowman et al., 2004). This is probably due to increased illness and/or disability at admission to residential homes, as a result of intensified effort from community services to keep older people in their own homes longer, rather than a deterioration during residence, since the length of survival is less than 12 months. A key policy driver associated with the complex needs of these residents has been to encourage care homes to safely avoid hospital admissions, and this was successfully achieved in a model of improved care in council-run residential homes by up-skilling social care staff with monitoring and essential nursing skills (Szczepura et al., 2008).

Several authors identify care homes and their residents as having the potential to benefit from innovative design and technology (Cantley and Wilson, 2002, Freedman et al., 2005, Carr, 2011). Evans and Vallelly (2007) in a review of the literature emphasise the importance of having the opportunity to get outside. They associate this with improved quality of life, sensory stimulation and physical activity levels in older people living in a range of supported housing settings, including care homes and extra care housing. They also draw attention to the importance of social networks and social interaction and conclude that interventions such as organised activities can minimise social isolation and increase social wellbeing. However, Wild et al. (2010) in a study of improved models of care for elders in residential homes (with no on-site nursing), observed the need to consider a much more health compromised population of older residents than in the past when designing care homes at the new-build stage, in particular to enable residents with dementia an ease of access to secure gardens.

THE DIVERSITY OF RESIDENTS AND CARE HOMES

Barnes (2002) highlight diversity not only in the resident population but also in the types of care home, both of which can present challenges to architects and designers of homes. They draw attention to the need for a multi-disciplinary approach to design, with quality of life as the marker of success in

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its post occupancy evaluation. However, they also acknowledge the difficulty in accurately predicting the performance of a new building or environment in relation to the human activities of staff and residents. The key features of diversity in older residents and their care homes are given in Box 1.

Box 1. Diversity in older residents and care homes	
Residents may have	**Homes may be**
• **General nursing and/or social care needs** • **Specialist care needs** • **Have lived in a home's locality or at a distance from it.** • **Been admitted from hospital or their own home.** • **Self-funding or council funded.** • **May have mental and/or physical disablements** • **Military traumatic disablement** • **Different ethnic, religious and cultural backgrounds** • **Different socio economic and educational backgrounds**	• **Residential or nursing homes** • **Specialist care registered** • **Commercial or not for profit** • **Owned by a single owner or by a group** • **Purpose built or adapted** • **Large or small** • **May be part of a 'village' concept** • **Charity, Voluntary, Commercial and independent, or Local Authority owned** • **Foreign-owned** • **Urban or remotely located**

Sources: (Szczepura A et al., 2004, Parker C et al., 2004).

Kydd et al. (2013) have found that, over the last decade, those working with older people have continued to perceive negative attitudes from those working in more hi-tech care areas towards the role of caring-giving for older people and a failure in the recognition of gerontological nursing as a specialist area. Other authors (Wild et al., 2010) report that a lack of role definition and boundaries between care staff and nurses, poor quality clinical training and supervision for competency, and isolation from mainstream health care systems impedes change in residential homes. Where institutional ways of working prevail in care homes, these can diminish the opportunity for older residents to learn new (or relearn old) skills for the activities of daily living and to exercise choice over the types of activities in which they wish to be involved (British Geriatrics Society, 2011). To overcome this, several authors have argued (Nolan et al., 2006, Help the Aged, 2006) that there is a need for staff to move towards relationship-centred care (Owen et al., 2012) if residents are

to achieve a sense of security, belonging, continuity, purpose, and achievement (Nolan et al., 2006). However, a review of the literature (Help the Aged, 2006) emphasises this culture change will require adequate staffing with consideration given to improved skill-mix and related training, all areas that are considered as challenges within this sector.

The above issues suggest that understanding the culture of care in a home that tends more towards over-protection of residents than promoting choice could be an important consideration prior to the introduction of new design and technology. Torrington (2006) has demonstrated that older residents' quality of life was poorer in buildings that prioritized safety and health. Conversely, buildings that supported activity with good assistive devices provided a positive association with well-being by giving people control over their environment and enabling good links to be established with the community. Thus, the main challenges for design and technology within this context would seem to lie in balancing the additional risk associated with increased activity with that of safety (Torrington, 2009) and overcoming staff resistance towards changing their care culture towards a more proactive and therapeutic approach that emphasizes and promotes the resident's self-help (Wild et al., 2012).

Influences that may have a negative bearing upon the acceptance of computer technology could be age, education, and income (Zickuhr and Smith, 2012). However, when there is experience of the use of similar products, older people are likely to learn to use related new technology faster than those with no previous similar usage experience (Lewis et al., 2007). Importantly, evidence suggests that when given the opportunity to use web-based technology older people can successfully learn new skills (Priest et al., 2007). In the UK, it has been estimated that in 2012, 5.5 million of the 10.8 million comprising the population aged 65 and over have been online (Age UK, 2013) with the majority of users aged 65 to 74.years. This is not surprising, for older people have not been immune to the massive increase in electronic and other technologies post World War 2. In the US, online banking and shopping, often utilized to overcome some of the restrictions imposed by physical disablement,

is also accessed by elders but to a lesser extent than their use of email and in comparison with other younger aged adults (Zickuhr and Smith, 2012). However, it is suggested that persistent barriers to internet usage may exist with older people's views shaped by their past experience of mechanical and electro-mechanical equipment. Thus, if they are to increase their use of social media applications, new formats that are more appealing to their generation would need to be developed (Sackmann and Winkler, 2013).

STAFF, RESIDENT AND RELATIVE PERCEPTIONS OF THE CARE HOME ENVIRONMENT FROM AN ENVIRONMENTAL LEARNING EXERCISE

Knowing what residents, their relatives and staff think about their care home environment is important to understanding how technology can serve their particular goals, activities and needs (Leikas et al., 2012). To this end, the outcomes from an environmental learning exercise undertaken in 2004 by the lead author with staff attendees from 10 Bristol-based care homes registered for the Bristol Care Homes' Network Programme are presented below. The Programme was established in 2003 following a local scoping exercise to determine the type of educational support needed by care homes (Wild et al., 2005). The sample for the environmental exercise included the 10 network participant care staff attending the programme plus their involvement of 1 other care staff member; one resident and one relative from each network home [all homes were registered for physically frail older people]. In this way, three groups with a total of 40 persons (20 care staff, 10 residents and 10 relatives), were asked to record first what meaning they attached to their 'own home' and second what meaning they attached to their care home as a 'home' [the 'own home' data has not been included here]. Responses were recorded by the programme participants as key words or phrases on guidance sheets, against simple pre-prepared categories. The analysis of the data was jointly undertaken by the 10 care homes' programme's participants and the author and involved placing each group's responses under category headings generated to represent the comments' overall meaning. After review, selection was made of representative responses that best captured the meaning attributed to the words 'care home'. To our knowledge there have been no studies following a similar inquiry which have been carried out more recently.

As can be seen from the analysis presented in table 1, the importance of a *friendly and happy atmosphere* was highlighted by all three groups**.** Staff emphasised activities in the home in terms of *interaction with other residents* as a means of *stimulation.* Relatives similarly perceived collective activities with other residents as *company* providing *stimulation.* In contrast, residents' perceptions were mixed with some recording *spending time with others* and *not being lonely,* but others indicated that interaction depended upon the abilities or willingness of other residents to converse and, in this, some residents said they preferred *to be left alone*.

The home was thought of as a *safe environment* by staff and relatives, whereas residents expressed the psychological need *to feel secure*, as distinct from being safe in a risk-modified environment. Staff described the approach to care as being *personalised*, relatives linked this to *medication being given,* and residents perceived it as *being looked after*. Both staff and relatives recognised the need for *choice, respect, and dignity* as part of the ethos of the home, but residents perceived the home as the place where they could have *personal items*, and where they wanted *a sense of belonging and ownership.* Given some of the residents' responses above, it is possible that these represented a way of retaining a personal rather than a collective identity, although some residents mentioned their *loss of independence*. Proximity to local amenities such as *shop*s and having *unrestricted visiting* were attributes of the home that were important to staff and residents but these were not mentioned by relatives. This suggests that there may be "trade-offs" for individuals, for example proximity to family or friends taking precedence over other aspects of the best possible home.

Having a *spacious environment* and *equipment* were mentioned by staff in terms of work-space, and relatives also appreciated the environment as *spacious*. However, residents made no mention of space in any context, perhaps because they were unable to access space independently without help from staff. Staff saw the care home environment as *noisy,* whereas residents mentioned the need *to be quiet,* but relatives made no comment.

Negative and positive issues were raised by staff related to the home as a work environment that were not reflected by either residents or relatives, although these impacted upon the environment from the care-giving perspective. These were focussed upon the particular difficulties of the independent and voluntary sector to maintain **sufficient numbers of staff, access training, and provide job security** but conversely positive aspects were found in **job satisfaction** and **feeling needed**. Only residents mentioned **having pets** as part of the care home environment and only relatives highlighted that the home reduced **worry**, and afforded them with an opportunity **to resume life.**

This focused exercise illustrates that between the three groups of 40 respondents there were some subtle qualitative differences in the way that each group gave meaning to the concept of their 'care home.' Understanding such differences as a preparatory exercise for new design or technology installation could provide not only ideas for new designs and technologies but also enable the identification of some of the barriers and obstacles at an early stage. The main limitation of this exercise was the relatively small sample size; larger studies would be needed to prepare for new design or technology installation.

Table 1. Staff, resident, and relative meaning attributed to a 'care home' *

Theme	Staff: n=20 (Participants & other staff)	Residents: n=10	Relatives: n=10
Atmosphere	• Bright, friendly, happy atmosphere. Good staff relationships.	• With friendly, nice staff. Being happy.	• Friendly atmosphere
Activity	• Interaction and activities with other residents for stimulation	• Spend time with others. Not to be lonely. *Limited conversation. To be left alone*	• Has company, stimulation through activities with other residents.
Safety and security	• Safe environment	• Feel secure.	• Provides safety
Care approach	• Provides quality care, personal care and access to outside services.	• Looked after.	• Provides care, medication
Control	• Choice and dignity	• Able to have sense of ownership and belonging. *Loss of independence.*	• Given respect & privacy. Gaining trust.
Access to external world	• Near local amenities	• Near shops	-
Bringing the outside world in	• Visitors at any time	• Visitors welcome	-
Space and purpose	• Spacious. Can get around easily and *w*ell equipped	• Able to have own belongings and pets.	• Spacious
Home's Challenges	• Noisy environment	• To have quiet.	-
Workplace negatives	• No job security. Insufficient staff. More training opportunities.	-	-
Home & workplace positives	• Job satisfaction. Feel needed.	-	• Reduces worry. Able to resume life.

* Source: Bristol Care Homes Learning Network Programme, Environmental Exercise (2004) – materials available from the author

CONSIDERATIONS FROM THE LEARNING EXERCISE FOR DESIGN AND TECHNOLOGY

Box 2 displays the synergies between the three groups' perceptions listed in table 1. The summative and descriptive paragraphs are positively framed to provide a positive and more holistic insight as to where benefit from technology could lie. Although the general aim of activities is to stimulate the resident, the nature of these activities was usually communal i.e. with other residents, not for the individual. By enhancing resource efficient ways of working for staff, more time to permit both individual and group activities could ensue; but, in turn, this could require a wider system of monitoring and alerting of untoward events.

For residents, physical dependency does not necessarily mean dependency of mind although their concept of 'being looked after' may suggest passivity rather than active participation in their care-related relationships with staff. Importantly, residents made no mention of activities within their care home, beyond having company from being with other residents but as this interaction was sometimes perceived to be of limited value, some preferred to be alone. Croucher et al. (2006) suggests that while care homes provide opportunities for companionship, some residents may be marginalised in particular those who are frail and/or cognitively impaired. However, the concepts raised here by residents of **being alone, not lonely,** and having **quiet** within the context of their care home, would seem to differ from a negative state of social isolation. Stuart-Hamilton (2000) describes 'being alone' as not necessarily meaning 'being lonely', and the possibility of being lonely even in a crowd of people. Although loneliness can be negative, inward looking and associated with depression, in some circumstances it can also become a positive experience of solitude and contemplation. Because the environment was described as noisy by staff, perhaps this offers a simple explanation for the desire of some residents to seek quiet and hence be alone.

Box 2. Key considerations for the development of design and technology

The culture of care
❖ For some residents, physical dependency does not mean that of mind. The resident may still need to feel ownership and sense of belonging. They need to be encouraged by a care focus that stimulates opportunity to self-help and the desire to increase life space within and outside of the home.

❖ Resource efficiency linked to adequate staffing levels ,skill mix and a team approach is needed to facilitate proactive rather than reactive care.

The range of activities for health and leisure
❖ Staff and relatives perceived residents' activities as collective involving other residents rather than for the individual and solitary. No-one mentioned activities as being fun. This should be an aim and one that is likely to of increase social interaction.
❖
The use of internal and external life space
❖ Staff should be encouraged to regard having space as important both to their care work and in providing an interactive and flexible opportunity to enable collective and solitary activities. As the care home environment does not stop at the front door but at the gate, the garden of**f**ers potential for many low cost activities if the design is fit for purpose**.**

The quality of life in the living environment
❖ Types of hearing loss are exacerbated by background noise. Minimising noise through design and technology has the potential to improve quality of life by permitting increased resident to resident and staff communications and interactions.

❖ *Residents not being lonely and wanting to be alone* are two different concepts. The need for quiet may mean having solitude for reflection or the pursuit of solitary activity. The responsibility for safety, as expected by relatives and of concern to staff will require technologies that permit unobtrusive monitoring and early alerting should untoward situations arise.

* Source: Bristol Care Homes Learning Network Programme, Environmental Exercise (2004) – materials available from the author

In terms of the environment, the desire to increase access to either internal or external life space was not mentioned by residents, perhaps reinforcing their situation of passive dependency upon others to permit such access. Having

space, although seemingly unimportant to residents, was important to staff in relation to the environment as a workplace. No-one mentioned the garden as a life space or in terms of any of many activities that it could potentially offer, perhaps because staff regarded it as less safe or time spent by residents within it could require additional monitoring. These differences of perception illustrate possible competing tensions within the care home environment. For, on one hand it is a 'home' for residents and a workplace for staff; but from the relatives' perspective, there is the expectation of a worry-free protected refuge for loved ones. Thus, it is possible that mindful of the relatives' concerns for safety and the standards required for regulation and inspection (Care Quality Commission, 2013), the staff's interpretation of these might result in overprotection in their care giving. In turn, this could diminish residents' choice and risk-taking, and reinforce a care relationship with staff grounded in a dependent rather than an interdependent relationship that could be more therapeutic and interactive (Fine and Glendinning, 2005).

Several authors recommend that the various factors contributing to such a complex environment need to be considered in order to identify barriers to the acceptance of new design and technology (Burton and Torrington, 2007, Cockton, 2008). Classifying older residents and staff according to their experience of technology usage to date, for example, can be a useful indicator of the performance with related new technology (Langdon et al., 2007). In addition, , as the designers of the enabling environment are more likely to be younger people, anticipating through their able-bodied life experience the essential qualities needed in design for disablement in late life, they would be wise to adhere to the following adage:

> ***'Design for the young and you exclude the old; design for the old and you include the young'*** [Mission of the Centre for Applied Gerontology, University of Birmingham].

The implication here being, that by designing successfully for older people, all can benefit irrespective of age.

POTENTIAL AREAS FOR DESIGN AND TECHNOLOGY IN CARE HOMES

Broadly speaking, design and technology that enables and empowers older residents, in turn is likely to have benefits for staff and vice versa. This may be by permitting staff to have more time and purpose for their care-giving activities or by improving health and quality of life for residents by making them (where possible) more able to exercise their sense of independence. Four major areas in which design and technology could potentially be extremely useful in the care home environment are:

> *i   Data management*
> *ii. Monitoring, alerting and compliance*
> *iii Equipment and furnishings*
> *iv. Health, wellbeing, leisure and learning*

In Table 2, these areas are given as headings for a variety of suggestions using existing digital or mechanical technologies. Inevitably, decisions as to the affordability of specific items will take account of 'the greatest good for the greatest number', and 'the greatest benefit for the least outlay'.

Table 2. Potential areas for design and technology in care homes

Principles	Ideas
DATA MANAGEMENT	
Routine care documentation **Audit: internally and externally relevant as: evidence-base for clinical decision-making; error reduction; early intervention** **Software to support other regulatory and business needs, i.e. resource efficiency & financial management**	• **Workforce/ workload/ skill-mix/ dependency data mining and modelling;** • **Assessment tools/measures for resident physical and mental performance.** • **Record keeping** • **Data linking resident to pharmacy / GP/other clinical information;** • **Interactive telemedicine with GP/practice nurses;** • **Stocktaking** • **Audit**
MONITORING, ALERTING AND COMPLIANCE	
Monitoring, alerting and safety devices, that permit choice over solitude, and freedom to roam **Staff monitor for cross infection; medication errors** **Resident monitor for falls; other critical incidents; essential practices** **Energy saving** **Wi-Fi provision**	• **Bar-coded touchpad medication systems;** • **Visual inter-com systems;** • **Unobtrusive wireless tracking for monitoring movement or place in home** • **Self-medication systems** • **Monitored staff hand-washing** • **Hydration and nutrition management** • **APPS as reminders e.g. to take medication** • **Energy saving heating and lighting, low cost natural and 'green' fuels/ mechanical adaptations** • **Self-activated and sensor alarms**
EQUIPMENT AND FURNISHINGS	
Aids to daily living **Fixtures and fittings** **Translocation equipment** **Remote control**	• **Continence and mobility promoting aids** • **Safe surfaces; colour sensitive** • **Self-activated remote control of TV and other electrical equipment.**
HEALTH, WELLBEING, LEISURE AND LEARNING	
Interior environment **Design that increases access to and activity in interior life space, yet provides solitude.** *Wi-Fi for internet /social networking* *Exterior environment.* **All weather activities to promote physical exercise and mental stimulation**	• **Internal flexible movement of walls;** • **Sound proofing/ absorbing potential.** • **Nintendo Wi;** • **3rd Age lifelong learning/ staff online training** • **Resident activated social interactive communications, e.g. Skype, Facebook** • **'Virtual' external access, e.g. Google Earth.** • **Access to a safe garden area with multiple opportunities for 'pleasurable' individual and collective pastimes; exercise; Vitamin D through exposure to natural sunlight** • **Speech recognition** • **Reminiscence** • **Exercise equipment**

Despite diversity within this sizeable and growing UK population of nearly half a million older people, technological solutions to meet their needs, and those of care staff, could also provide major export opportunities at a time of urgent need to resuscitate the UK economy. The potential growing wealth of key markets e.g. Brazil, Russia, India, China and South Africa (BRICS,) is strategic to UK economic recovery at this time, particularly in the area of high-value manufacturing (HVM). At a time when this is being encouraged by UK government grants and tax-breaks for leading-edge research and development, the opportunity exists to focus technology to improve the lives of older people and staff in the complex and diverse environment of care homes. However, it should be noted that some of the immediately available technological solutions of relevance to older people in care homes may have origins that are far from obvious, as they may come from industries well-removed from healthcare e.g. Defence, Retail, Logistics, Sports & Leisure, etc. Examples of technologies from such industries which have been adapted for older people include many involving technology-transfer e.g. secure communications systems from Defence, GPS automatic vehicle location systems from Logistics and sophisticated lighting systems from the Leisure Industry. New initiatives and pilot-schemes underway include 3Ci (Command and Control) systems for ambulance-tracking and infection-control systems reliant on the latest micro-electronics and wireless-engineering.

At the same time, barriers to engagement of older people with technology, particularly the internet, are slow to disappear. In the UK, of all internet users only a third are aged 75 and over. Use of the internet showed gender differences for adults aged 65 years and over, for whereas 48% of males aged 75 and over had used the internet, the corresponding total for females was lower at 26% (Office of National Statistics, 2013). The remaining barriers are likely to be broken down in future generations which are already in the digital age.

Manufacturers are also increasingly offering a range of digital technologies and social media applications which are more appealing to older people, e.g. applications which are enabled by the extremely familiar domestic TV set,

including a wide variety of entertainment and the extensive scope of Telecare, Telehealth and Telemedicine. The latter are at the commencement stage of what could well become a healthcare revolution and a possible solution to the current severe overstretch and overspend being experienced across NHS hospitals and care-homes.

CONCLUSIONS

This article highlights the inter-relationship between the potential value of a technology and the need to carefully consider the different perspectives of users, carers and staff if optimum benefit is to be realised. In particular, the article has highlighted the diversity within the care homes sector that in general operates as commercial or not-for-profit businesses with the unwanted 'aged overspill' from public funded health and social care systems as its main customers and consumers. The importance of seeking first-hand the involvement of staff, residents, and relatives to enable a clear understanding of shared and competing perspectives when designing the care home environment or developing new technologies has been emphasised. For only by listening to their views can feasibility, likelihood of acceptance and potential benefits be achieved and thus avoid the arrival at untenable solutions to under-researched problems that could be a waste of resources.

The challenge is to create technology that recognises residents' long-term needs as well as being seen as useful within the work context by those caring for them, while recognising that technology is not a panacea for some of the major issues faced by older people today. Although UK public finance is under great pressure and new technology is only likely to be adopted if it can offer demonstrable, immediate and significant savings to current tight budgets, this paper is intended to strike an optimistic note. For, despite the obstacles to be overcome, modern design and technology that can demonstrate its 'fitness for purpose' and 'value-for-money' has much to offer care homes by affording new ways of working for staff within the same or reduced resources, with the mutual aim of improving the quality of (and

interest in) life for care home residents.

REFERENCES

AGE UK 2013. Digital inclusion. in Factsheet: Later life in the United Kingdom. London.

BARNES, S. 2002. The design of caring environments and the quality of life of older people. *Ageing & Society,* 22**,** 775-789.

BOWMAN, C., WHISTLER, J. & ELLERBY, M. 2004. A national census of care home residents. *Age Ageing,* 33**,** 561-6.

BRITISH GERIATRICS SOCIETY 2011. A Quest for Quality. An Inquiry into the Quality of Healthcare Support for Older People in Care Homes: A Call for Leadership, Partnership and Improvement.: British Geriatrics Society Joint Working Party Inquiry.

BURTON, E. & TORRINGTON, J. 2007. Designing environments suitable for older people. *CME Geriatric Medicine,* 9**,** 39-45.

CANTLEY, C. & WILSON, R. C. 2002. Put yourself in my place. *Designing and managing care homes for people with dementia, .* York: Joseph Rowntree Foundation.

CARE QUALITY COMMISSION 2010. The adult social care market and the quality of services. London.

CARE QUALITY COMMISSION 2013. Standards for Care Homes. London: Care Quality Commission.

CARR, R. F. 2011. Nursing Home: Whole Building Design Guide. Washington DC: VA Office of Construction & Facility Management.

CENTRE FOR POLICY ON AGING 2012. A profile of residents in Bupa care homes: results from the 2012 Bupa census. London.

COCKTON, G. 2008. Designing worth – Connecting preferred means to desired ends. *Interactions,* 14**,** 54-57.

CROUCHER, K., HICKS, L. & JACKSON, K. 2006. Housing with Care for Later Life: A Literature Review. York: Joseph Rowntree Foundation.

EVANS, S. & VALLELLY, S. 2007. Best practice in promoting social well-being in extra care housing. A literature review. York: Joseph Rowntree Foundation.

FINE, M. & GLENDINNING, C. 2005. Dependence, independence or inter-dependence? Revisiting the concepts of 'care' and 'dependency'. *Ageing and Society,* 25**,** 601-621.

FREEDMAN, V. A., CALKINS, M., DEROSIERA, R. & VAN HAITSMA, K. 2005. Barriers to Implementing Technology in Residential Long-Term Care Settings. Washington DC: U.S. Department of Health and Human Services.

HELP THE AGED 2006. My home life. A quest for quality in care homes. London: Help the Aged in partnership with the National Care Forum and the National Care Homes Research and Development Forum.

ISAACS, B. 1992. *The challenge of geriatric medicine,* Oxford, Oxford Medical Publications.

KYDD, A., WILD, D. & NELSON, S. 2013. Using a national and multinational questionnaire to elicit health professionals' attitudinal responses

towards to caring for older people: Part 2. *Nursing Older People,* 25**,** 21-28.

LAING AND BUISSON 2013. Press release: Councils reply on a hidden tax on older care home residents. London.

LANGDON, P., LEWIS, T. & CLARKSON, J. 2007. The effects of prior experience on the use of consumer products. *Universal access in the Information Society,* 6**,** 179-191.

LEIKAS, J., SAARILUOMA, P., ROUSI, R. A., KUISMA, E. & HANNU VILPPONEN, H. 2012. Life-based design to combat loneliness among older people. *The Journal of Community Informatics,* 8.

LEWIS, T., LANGDON, P. & CLARKSON, P. J. 2007. Cognitive aspects of ageing and product interfaces: Interface type. *Human-Computer Interaction.*

NOLAN, M., DAVIES, S. & BROWN, J. 2006. Transitions in care homes: towards relationship-centred care using the 'Senses Framework'. *Quality in Ageing and Older Adults,* 7.

OFFICE OF NATIONAL STATISTICS. 2013. *Internet access quarterly update* [Online]. Available: http://www.ons.gov.uk/ons/rel/rdit2/internet-access-quarterly-update/q3-2013/stb-ia-q3-2013.html#tab-Key-points [Accessed 10th February 2014].

OWEN, T., MEYER, J., CORNELL, M., DUDMAN, P., FERREIRA, Z., HAMILTON, S., MOORE, J. & WALLIS, J. 2012. My Home Life: Promoting Quality of Life in Care Homes. York: Joseph Rowntree Foundation.

PARKER C, BARNES S, MCKEE K, MORGAN K, TORRINGTON J & TREGENZA P 2004. Quality of life and building design in residential and nursing homes for older people. *Ageing & Society,* 24**,** 941–962.

PRIEST, L., NAYAK, L. & STUART-HAMILTON, I. 2007. Website task performance by older adults. *Behaviour & Information Technology,* 26**,** 189-195.

SACKMANN, R. & WINKLER, O. 2013. Technology generations revisited: The internet generation. *Gerontechnology,* 11**,** 493-503.

STUART-HAMILTON, I. 2000. *The psychology of ageing : an introduction,* London, Jessica Kingsley.

SZCZEPURA A, DAVIES C, WILD D, JOHNSTON I, BIGGERSTAFF D, FORD P & VINOGRADOVA Y 2004. NHS Funded Nursing Care in Care Sites in England: An Initial Evaluation.: Centre for Health Services Studies, University of Warwick, Coventry, UK. ISBN 0 902683 76 4.

SZCZEPURA, A., NELSON, S. & WILD, D. 2008. In-reach specialist nursing teams for residential care homes: uptake of services, impact on care provision and cost-effectiveness. *BMC Health Serv Res,* 8**,** 269.

TORRINGTON, J. 2006. What has architecture got to do with dementia care? Explorations of the relationship between quality of life and building design in two EQUALprojects. *Quality in Ageing and Older Adults,* 7**,** 34-48.

TORRINGTON, J. 2009. Extra care housing: Environmental design to support activity and meaningful engagement for people with dementia. *Journal of Care Services Management 3,* 3**,** 250-257.

WILD, D., FEAR, T. & MEANS, R. 2005. Using a scoping exercise to guide the development of a care homes learning network. *Nurs Older People,* 17**,** 20-3.

WILD, D., NELSON, S. & SZCZEPURA, A. 2010. A 'home for life' in residential homes for older people in England: Exploring the enhancers and inhibitors. *Housing, Care and Support Journal,* 13**,** 26-35.

WILD, D., NELSON, S., SZCZEPURA, A. & KYDD, A. 2012. A new model of care for the older person. *Nurs Times,* 108**,** 12-5.

ZICKUHR, K. & SMITH, A. 2012. Digital differences. Washington DC: Pew Research Center's Internet & American Life Project.