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Potential technological solutions to promote mental well-being in older age

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This paper seeks to promote debate about the need to create synthesis between the efforts of older people to promote their mental well-being, and the adoption of technology to support them in their efforts.

Introduction

There is current interest, by technologists, policy makers and service planners in developing assistive technologies that can play a role in enhancing older people's health and well-being (Audit Commission, 2004; Bouma et al, 2009; Department of Health [DoH], 2005a, 2009a; Down & Stead, 2006; Finch et al, 2005). Consequently, technologies are being developed with the explicit aim of supporting older people to live independently in their communities, age in their preferred place, experience social inclusion, continue to engage in meaningful relationships and enabling them to do what they perceive to be meaningful.

Despite these developments the findings from a study, undertaken by the authors, concerning strategies that older people adopt to maintain their well-being, revealed that few of the participants made reference to assistive technologies[1] (Moyle et al, 2010). The issue is therefore raised in this paper whether older people are exploiting the technological advances that are being made. Prior to turning to this discussion a brief summary of the study and findings will be given.

Overview of the study: methods

The study aimed to explore the strategies that older people adopt to maintain their well-being. This was addressed through a multi-national Appreciative Inquiry (AI) design. There are different variations to AI research, but this study was based on the 4-D-cycle – Discovery, Dreaming, Designing, Delivery – developed by Cooperrider et al (2003). AI is a strength-based approach, which explores and appreciates the approaches used by participants (Reed 2006; Reed et al., 2008). Here the participants were invited and consented to take part in discussions about what they valued in their life that contributed to their well-being and the strategies that they adopted to maintain and enhance this.

The participants were over 65 years, had the capacity to provide consent, and were living in their own home. Fifty-nine people participated from Australia (n=21), Germany (n=9), South Africa (n=18), and the UK (n=11). In Germany, Australia and the UK participants were recruited from naturally occurring groups of older people, such as societies or campaign associations. In South Africa participants were recruited via different means - through community organisations, retirement villages or state health care facilities. The differences across the sample were likely to be extensive in other ways, given the cultural, economic, and environmental composition of each country. The sample was therefore a convenience sample, dependent on the opportunities each country project lead had to identify and invite participants.

The interviews were audio-recorded and non-English data was later translated into English. Analysis involved an iterative process of initial scrutiny by individual members of the team. This led to identification of issues and topics that were discussed by the participants. Dialogue between the research team members led to refinement of the codes and development of the themes (Further details of the study are reported elsewhere Moyle et al, 2010 and Reed et al, 2008).

Key findings relating to mental health well-being

Participants described their experiences of mental well-being in relation to: social isolation and loneliness; social worth; self-determination; and security. Strategies utilised to promote mental well-being included maintaining community connections and relationships, keeping active, and emotional, practical and spiritual coping. Although there were some variations between countries, these strategies transcended culture and nation. As few participants discussed the role of assistive technologies, apart from access to the telephone, the authors reflected on their experiences, literature and research to identify potential technologies that may have assisted participants to enhance their self-reported strategies to promote their mental well-being.

Whilst the following table is not intended to provide a comprehensive overview of developments in gerontechnology, it does highlight technological solutions that have the potential to support the strategies older people themselves adopt, and services provided to maintain and enhance mental well-being.

Table 1: Technological solutions to support mental well-being strategies adopted by older people

Strategies adopted by older people to maintain and enhance mental health well-being	Examples of technological solutions to support these strategies: What individuals could adopt; service provided technological solutions
Keeping active	**What individuals could adopt** Gaming programmes and software that facilitates older people's involvement in physical activity such as Wii-sport and tele-games. These games allow the players to mimic the actions performed in real life sports to maintain fitness Exercise equipment that provides biofeedback such as exercise bicycles **Service provided technological solutions** Sensor technology such as falls detectors, and TILDA project – Magic carpet is perceived by older people as a strategy to modify the risk of untoward outcomes following falls thereby individuals engage in higher levels of physical activity Therapeutic technologies utilized in rehabilitation programs such as: Gait trainer; Robots such as Care-O-Bot Fraunhofer IPA can provide support when walking amongst other daily activities (http://www.care-o-bot.de/english/)
Community connections and relationships	**What individuals could adopt** E-communication to enable older people to maintain contact with their family and friends, examples include: • E-mail • Social networking sites focus on building social relationships among people with shared interests and/or activities: Facebook, twitter, etc.

	Service provided technological solutions E-communication to enable older people to maintain contact with their family and friends, examples include: • Use of computer communication terminals in residential facilities • Connect for Care is a novel touch screen videotelephone system (http://www.connectforcare.com/) Netcarity is a project that is investigating how new and existing technologies can be integrated cost effectively into people's homes, remaining connected and making them feel more comfortable about remaining in this familiar environment. (http://www.netcarity.org/Leading-from-the-front.717.0.html) Sound technologies adopted in building design that enable people to hear each other and communicate
Practical coping	**What individuals could adopt** Remote control purchased with household multimedia technology Electronic intelligence systems such as normal living systems in homes that provide automatic control of housing parameters for living such as smart ventilation and light controls to adjust lighting to activity i-robots such as robot vacuum cleaners: http://www.electricshopping.com/shop/electric-shopping/for-my-home/vacuum-cleaners/robotic/irobot-roomba-scooba-floor-washing-robot/index.html Use of IT and internet: • E-shopping (using the Internet for shopping) • Internet banking • Technology-based home budget system **Service provided technological solutions** • Easy opening cans - now widely available in supermarkets • Medication reminders Smart housing has inbuilt technological devices to aid resident's independence. Telecare systems that include: • Sensor technology, including movement sensors, flood alerts, CO2 detectors as an early warning system • Emergency call systems • Voice recognition door entry systems • Access control technologies • Medication reminders Telemedicine and telehealth services • E-health involves professionals using telecommunication technology to monitor people's health in their own home. Artificial intelligence and robotics • Care-O-Bot Fraunhofer IPA with features such as an intelligent walking frame, carrying and fetching services. Care-O-Bot 3 detects and grasps household objects and can safely exchange them with humans, (http://www.care-o-bot.de/english/) Use of IT and internet • E-shopping • Internet banking • Technology-based home budget systems
Emotional coping	**What individuals could adopt** E-learning means using Internet to access learning resources Social support e-groups relates to online social networking **Service provided technological solutions** Ambient Assisted Living technologies that enable older people to remain as independent as possible and to live in their preferred place **Emotional robotics with products such as** PARO or PLEO. These are artificial emotional creatures designed to interact with and develop an emotional attachment to human beings (http://www.parorobots.com/ and http://www.pleoworld.com/Home.aspx) (Klein & Cook 2009) Computer programs and systems, such as Connect for Care, which promote mental stimulation
Spiritual coping	**What individuals could adopt** Be well platform provides a central source of information, support and advice on social and mental health issues (http://www.bebo.com/bewell) Online-advisory and counselling services provided by welfare organisations (e.g. http://www.beratung-caritas.de/) Infra-red therapy can improve mood and sleep patterns. **Service provided technological solutions** Church organisations utilize web 2.0 with features such as Blogs, Twitter, Facebook, Second Life, and Social Bookmarking such as http://www.kirche-im-web20.de/wiki/doku.php/twitter Spiritual television channels and websites

Discussion
This mapping of observations by the research team and empirical findings adds to the increasing awareness of the challenges of technology adoption by older people who live independently in their own homes (Coughlin, 2007; Oppenauer, 2009). Though the participants spoke spontaneously about many subjects, technology (apart from the telephone) did not appear in any part of the individual and group interviews. This could be due to many of the above listed technologies

and applications being very new and not widely available in the market during the time the interviews took place, or they were pilot projects, or in the early adopter stage of development.

Alternatively, participants may have perceived that the technologies had no/limited personal utility (for example child/adolescent games such as Wii-sport) or were products that were widely available in modern society (such as easy opening cans and E-shopping) and therefore not worthy of mention. Equally it could be argued that the participants lacked awareness of the availability of assistive technologies. Acceptance and adoption of such technology is inextricably linked to knowledge about what is available, its perceived usefulness, and perceived ease of use and cost (Clarke and Cook, 2009; Magnusson, 2004; Oppenauer, 2009; Tinker et al 2003; Wanless, 2006).

Table 1 provides a mapping of the strategies used by older people to promote mental well-being with examples of existing technological solutions that could be adopted by the individual or with help of a service provider. It is clear that a wide range of systems and products exist that could be utilized by older people to support mental well-being. On an individual-level older people can be supported to keep active through engagement with multimedia technologies that promote participation in, for instance, exercise and fitness programs. Maintaining social relationships can be achieved through the many forms of E-communication that are widely available, and practical coping is enhanced through innovations in remote control systems. Having access to the internet offers solutions to address the practicalities of daily life such as utilisation of E-shopping.

On an organisational level services such as telecare can be used to maintain independence and minimize risks for older people to enable them to continue to live at home in their communities. Besides the consequent utilisation of new technologies this requires new organisational design, restructuring of tasks and professional development (Klein, 2010).

On a societal level the Internet and Web 2.0 can provide a means for older people to continue to experience inclusion in wider society, gain knowledge of public services and have ease of access to health and social care services. Keeping active can be restricted as a consequence of disability and building design barriers. Hence, design features such as technology-controlled barrier-free environments can enhance ease of access to buildings, and ease of movement within.

It is noteworthy that the example of E-shopping is a technology that transcends the classification used in this discussion: those technologies that individuals can access to help themselves and those that are provided by services (i.e. E-shopping is provided in the UK by supermarkets and accessed by individuals to meet a wide range of needs that are not necessarily age-driven). No doubt there are other examples that can be identified that transcend such boundaries. Perhaps this points to a continuum in the development and adoption of assistive technology. At one end of the continuum there are those technologies that can be utilised to enable older and disabled people to help themselves to address their needs and overcome their difficulties. This may normalise what may in other circumstances be construed as assistive technology. At the other end of the continuum exists those technologies that are adopted to address the health and social care needs of older and disabled people, thus associating adoption of assistive technology with the problematisation of ageing.

Future directions
Returning to the findings from the study that was introduced at the beginning of this discussion it is evident that the participants did not acknowledge the capacity of assistive technologies to promote their well-being. This may have been due to a limitation of the study – no specific questions were asked about technologies. Equally this outcome is worthy of further consideration and may point to avenues for further research, which may also include exploration of processes that facilitate the normalising of assistive technologies and adoption in everyday life.

It is clear that technological solutions are available and could be adopted by older people to enhance the strategies that they employ. However knowledge about these possibilities seems to rest with experts working in the broad field of gerontechnology. This is illustrated in the way that policy makers, urban planners and health and social care providers are promoting the adoption of assistive technologies to address the needs and challenges that occur in old age (Audit Commission, 2004; DoH 2005a, b; 2008; 2009b; Down and Stead, 2006; King, 2004; Pountney, 2009; Woolham et al, 2006). This in turn points to the need to sharpen the focus on developing an understanding of the most effective approaches to promote the adoption of technology by older people.

Notes
[1]Assistive Technology: An umbrella term for any device or system that allows an individual to perform a task they would otherwise be unable to do or increases the ease and safety with which the task can be performed (Tinker et al, 2003).

Acknowledgement

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