Re-purposing voice assistant technology for use by people living with dementia and their carers

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Purpose The use of voice assistants (e.g., Amazon Alexa, Google Home) is being widely advocated as part of supporting people living with dementia at home. The development of this technology is largely driven by industry, and there is little research to determine how people living with dementia, family carers and professionals can use voice assistants, and understand the challenges that this technology presents. In the UK there is an impending digital switch away from analogue systems that is poised to take place by 2025, hence it is essential that alternative technologies are adopted by mainstream health and care services and that acceptance and utilization is high. This paper presents the findings from two studies: 1 - a qualitative enquiry aiming to identify the views and barriers of using voice assistants by people living with dementia, family carers and professionals; 2 - a pilot case study evaluating a prototype that addresses barriers identified during study 1, entitled IntraVox. Based on processing of smart home sensor data, IntraVox uses a personalised human voice to send prompts and reminders to end-users to conduct daily life activities and to activate smart home processes using voice assistants. **Method** Study 1 – a Community of Practice (CoP) comprised of 24 members—two people with dementia (1 = F, 85 years; 1 = M, 94 years), 3 family carers (live-in daughter of the woman; live-in daughter and son-in-law of the man), 4 individuals from carer organisations, 5 Local Authority adult social care professionals, 2 commissioners, 6 National Health Service older people's service managers, 2 NHS technology managers of digital health care solutions were recruited. Seven group interviews were conducted. We firstly conducted 3 group interviews with a mix of health, social care, technologist professionals, and carer organisation CoP members, followed by 2 group interviews comprised of the people with dementia and their family carers. Participants were asked about their personal experience and views of smart technology (e.g., purposes, barriers), with a focus on voice assistants. Following analysis of this data, a technological solution, IntraVox (Cook et al, 2020), was developed to address barriers to use of voice assistants. In keeping with co-production methods a further 2 on-line interviews, were conducted with 9 CoP members to explore their views of the IntraVox prototype. Design changes were subsequently made, such as type of voice used to activate the voice assistant. Study 2 – was a pilot study of IntraVox with one person with severe dementia and their family carer. These individuals were identified through discussion with a Local Authority provider that was aware that, although the client was using telecare and smart products, problems persisted. The client was a woman with advanced dementia, who lived alone at home. Her son provided care and stayed with her during evenings and mornings. Several carers (city council employees) visited the mother twice daily to prepare meals and provide medication prompts. As this was the first deployment of this technology the service provider supported the use of the technology, with restriction to one client. The pilot study had two phases of data collection. In Phase 1, the pre-deployment of IntraVox, a semi-structured interview was carried out with the son to determine his familiarity with smart home devices, key issues in his caring role and how IntraVox could provide an intervention. Through this interview, it was identified that IntraVox should provide a prompt to alter the mothers behaviour when entering a food storage area. Following this initial interview, IntraVox was installed in the mother's home for use over 7 days. In Phase 2, a post-study semi-structured interview was conducted to explore the son's views and experiences of IntraVox, and his views of the impact that IntraVox had on his mother's situation. **Results and Discussion** The results of these studies indicate that family carers and professionals use voice assistants in their caring role for home automation, skills maintenance and development, prompts and reminders, behaviour and environment monitoring, and for leisure and social interaction support. The findings also show that family carers and professionals have specific challenges that need to be overcome for optimum use. The case study provided a useful demonstration that interoperability can be achieved to enable exchanges between IntraVox and voice assistants, providing customised and personalised technological solutions that address some of the barriers that people with dementia and their carers face in the use of voice assistant technology.

References

Cook, G., Courtney, L., Holmquist, LE, Salai, AM., Stephanou, N (2020) Personalised everyday technologies to support independent living . Royal College of Occupational Therapists Bulletin. https://drive.google.com/file/d/1kaxGMhGYAH4iYW2G40o7F_HDa2hgrOJx/view?usp=sharing

Salai, A., Kirton, A., Cook, G., Holmquist, LE. (2022) Views and Experiences on the Use of Voice Assistants by Family and Professionals Supporting People with Cognitive Impairments. 'Editors' Showcase: Dementia Care' in Frontiers in Dementia. https://doi.org/10.3389/frdem.2022.1049464

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