

Ageing and Digital Technology

Barbara Barbosa Neves
Frank Vetere
Editors

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Designing and Evaluating Emerging
Technologies for Older Adults

 Springer

Editors

Barbara Barbosa Neves
School of Social and Political Sciences
University of Melbourne
Parkville, VIC, Australia

Frank Vetere
School of Engineering
University of Melbourne
Parkville, VIC, Australia

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Foreword

We are all aware of the rapidly changing demographics in most countries where a combination of improved health care, changes in birth rate and improvements in infrastructure for housing, water and energy have led to an increasing number of older people in their populations. These changes bring significant challenges to our societies and our governments. Too often, political debate has focussed on population ageing as a negative issue, a burden to be managed. The prejudice expressed by employers through rejection of people over 55–60 reflects a deeper community prejudice against older people, namely that they are inevitably slow, resistant to change and prone to serious health problems. All these generalisations persist, but they are wrong.

Increasing life expectancy is an economic good. Longevity makes a major contribution to the national economy. Older people are both contributors and consumers of products and service, adding to economic growth. In Australia, the over-55s represent just 26% of the population, but hold more than 50% of the economic assets. Through voluntary work, care of the old and disabled and provision of child care, they contribute billions of dollars to the economy (Butler, 2015).

Surveys in various countries show that the majority of older people want to live independently in their own homes for as long as possible. In Australia, only 7% live in aged care residential facilities, but these have dominated policy decisions. The emphasis has to be on Ageing-in-Place. Rapid changes in technology, particularly those driven by information and communication technologies, offer a multitude of opportunities to support this approach.

As a materials scientist and engineer who has worked in academia as a researcher and educator, in industry and Government as a research administrator and advisor on policy on science and technology, I am acutely aware of the need to ensure that technology developments meet the needs of society. Thus in recent years, I have been active in addressing the opportunities offered by the convergence of nanotechnology, biotechnology, information and communication technology and cognitive science in developing assistive technologies for older adults and people with disabilities.

Three critical areas for support are security and safety, diagnosis and treatment, and mobility (Tegart, 2014). Aspects of these are discussed in various contributions to the present volume, for instance, through virtual reality (Chaps. 10 and 14), digital gaming (Chaps. 6 and 15) and assistive technologies (Chaps. 13 and 16). Underlying all of these is the need for communication and social interaction, as noted in Chap. 5 by Waycott and colleagues. Hence, social technologies are central to this collection (see, in particular, Chaps. 3, 17 and 18). In addition, an enormous variety of assistive technologies and devices continue to be developed and marketed, and increasingly we are learning how they can be a friend to older people and improve their quality of life as shown throughout the book.

Thus, for security and safety, we can design and build or retrofit elderly friendly housing, incorporating sensors to monitor activity and to avoid falls and hospitalisation, while companion robots and virtual reality can improve quality of life for older people with disabilities. Unobtrusive monitoring devices can assist people with dementia, although important ethical issues have also to be considered, as discussed in Chap. 13 by Gibson and colleagues. Suitably designed mobile devices can provide easy communication with family and carers, and empower older people to facilitate community connections and societal engagement (see Chaps. 3, 5, 11 and 13).

For diagnosis and treatment, telehealth systems have been deployed to support Ageing-in-Place by monitoring vital signs and medications at home and transmitting data to carers who can take action to avoid hospitalisation. In remote areas and even in cities where travel can be difficult for older people, videoconferencing enables specialist consultations without travel. However, these systems are rapidly being superseded by mHealth, the widespread use of smart mobile phones and wearable monitors for a range of vital parameters.

Linkage to suitable apps enables people to check their health anywhere. Ageing-in-Place is becoming Ageing-Anywhere!

In mobility, the increasing use of mobile scooters by older people has resulted in a rise in accident issues. These will be substantially reduced by the development of autonomous electric vehicles which will revolutionise transport in both cities and rural areas. Car-sharing services are already established in many cities, and these could be expanded with new generation vehicles resulting in a better quality of life for older people.

However, the acceptance and use of such assistive technologies depend on the perception and attitudes of the potential customers. Too often, the younger technologists developing these technologies and associated devices neglect to consult with older adults and, as a result, their products are market failures.

The issues in adoption and use of new technologies by older adults are complex and are explored as a major theme throughout this book. There is a wide diversity amongst older people which needs to be recognised. It is essential to know more about the contributions, capacities, needs and aspirations of older people. This collection addresses this gap by focusing on that missing knowledge in a comprehensive and multidisciplinary way. For instance, several chapters discuss critical

theoretical, methodological and ethical issues to ensure we reach that goal (e.g. Chaps. 2–4, 7–9 and 11–13).

Thus the needs, capabilities and interests of those in their 60s are different from those in their 80s. In many countries, variations in ethnicity and language bring different challenges of inclusion and ability to access aged support services. Further, there are significant socio-economic differences and regional variations which need to be recognised. Urbanisation is growing and the needs of older people must be recognised in appropriate housing and infrastructure. In large countries like Australia, there are special needs for rural areas and for indigenous communities with transport, health care and social communication. Collaboration and co-operation with older people across their spectrum of interests and experiences can offer the opportunities for new approaches to assistive technologies, as shown, for example, through digital games (Chaps. 6 and 15) and virtual reality (Chaps. 10 and 14).

However, for new enterprises in assistive technologies to be created as a positive contribution to the economy, four supporting factors have been identified in addition to social needs and opportunities (Tegart et al., 2016). These are as follows: a market focus is critical, expert champions are required, long-term business models are crucial, and new interdisciplinary players must be involved.

This book makes a significant contribution to the development and application of assistive and social technologies for older people by bringing together an international team of sociologists, gerontologists, computer scientists, engineers and architects to explore their design, implementation and evaluation. It offers an innovative, critical and comprehensive approach to technological and social issues in this rapidly changing field. I am delighted to be invited to write this foreword and I highly commend this book to the readers.

Melbourne, Australia

Greg Tegart
Victoria University

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Greg Tegart (Ph.D.) whose current area of activity are health, longevity, and technology, has had a long career in academia and industry in the areas of research, teaching, and management, and in the Australian Public Service in administration and high-level policy advice to the Australian Government on science, technology, and environment. He is an Adjunct Professor at Victoria University, Centre for Strategic and Economic Studies (Melbourne). Prof. Tegart is a Fellow of the

Australian Academy of Technological Sciences and Engineering (ATSE) and is currently Deputy Chair of the Health and Technology Forum of ATSE. He was the author of a major ATSE report in 2010 on Smart Technology for Healthy Longevity and has led delegations to France and Taiwan on this topic. He was selected as ACT Senior Australian of the Year in 2016.

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Editors and Contributors

About the Editors

Barbara Barbosa Neves, Ph.D. is Assistant Professor/Lecturer in Sociology at the University of Melbourne, Australia. Previously, she was Associate Director and Research Associate of the *Technologies for Aging Gracefully Lab* (TAGlab) at the Department of Computer Science, University of Toronto, Canada. She has researched and published widely on sociology of technology, digital technologies, ageing, families, and on the links between digital and social inequalities. Her current research projects examine the role of emerging social technologies (from Virtual Reality to robotic companions) in addressing loneliness, isolation, and social exclusion in later life.

Frank Vetere, Ph.D. is Professor in the School of Computing and Information Systems at the University of Melbourne. He directs the Microsoft Research Centre for Social Natural User Interfaces (Social-NUI) and leads the Interaction Design Laboratory. His expertise are in human–computer interactions and social computing. He has particular interests in design thinking and in technologies for ageing well. His research aims to generate knowledge about the design and use of information and communication technologies for human well-being and social benefit. He applies human-oriented design techniques, interpretations of ethnographies and evaluation of technologies to create knowledge about the design and use of ICTs.

Contributors

Fausto Amaro University of Lisbon, Lisbon, Portugal; Atlântica University, Oeiras, Portugal

Marcos Baez University of Trento, Trento, Italy; Tomsk Polytechnic University, Tomsk, Russia

Ron Baecker TAGLab, University of Toronto, Toronto, Canada

Steven Baker The University of Melbourne, Parkville, Australia

Christopher Ball Michigan State University, East Lansing, USA

Josep Blat Universitat Pompeu Fabra, Barcelona, Spain

Katie Brittain Northumbria University, Newcastle upon Tyne, England, UK

Ann Bygholm Department of Communication, Aalborg University, Aalborg, Denmark

Fabio Casati University of Trento, Trento, Italy; Tomsk Polytechnic University, Tomsk, Russia

José Coelho LASIGE, Departamento de Informática, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal

Graeme W. Coleman The Paciello Group (UK) Ltd, London, UK

Shelia R. Cotten Michigan State University, East Lansing, USA

Stephen Cutler University of Vermont, Burlington, USA; University of Bucharest, Bucharest, Romania

Carlos Duarte LASIGE, Departamento de Informática, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal

Susan M. Ferreira Télé-Université du Québec, Quebec City, Canada

Jessica Francis Michigan State University, East Lansing, USA

Rachel Franz University of Washington, Seattle, USA

Grant Gibson University of Stirling, Stirling, Scotland, UK

Edgar Gómez Cruz University of New South Wales, Sydney, Australia

Thuong Hoang Deakin University, Burwood, Australia

Loredana Ivan National University of Political Studies and Public Administration, Bucharest, Romania

Travis Kadylak Michigan State University, East Lansing, USA

Anne Marie Kanstrup Department of Planning, Aalborg University, Aalborg, Denmark

Stephanie Liddicoat Faculty of Architecture, Building and Planning, The University of Melbourne, Melbourne, Australia

Cosmin Munteanu Institute of Communication, Culture, Information and Technology, University of Toronto Mississauga, Mississauga, Canada

Barbara Barbosa Neves The University of Melbourne, Parkville, Australia; The University of Melbourne, Melbourne, Australia

Clare Newton Faculty of Architecture, Building and Planning, The University of Melbourne, Melbourne, Australia

Radoslaw Nielek Polish-Japanese Academy of Information Technology, Warsaw, Poland

Jessica Noske-Turner University of Leicester, Leicester, UK

Elizabeth Ozanne The University of Melbourne, Melbourne, Australia

Adriano Pasqualotti University of Passo Fundo, Passo Fundo, Brazil

Alexander Peine Utrecht University, Utrecht, Netherlands

Anabel Quan-Haase University of Western Ontario, London, Canada

Valeria Righi Ideas for Change, Barcelona, Spain

Louise Robinson Newcastle University, Newcastle upon Tyne, England, UK

Andrea Rosales Universitat Oberta de Catalunya, Barcelona, Spain

Stephanie Sadownik Ontario Institute for Studies in Education, University of Toronto, Toronto, Canada

Ryo Saegusa Kanagawa Institute of Technology, Atsugi, Japan

Sergio Sayago Universitat de Barcelona, Barcelona, Spain

Jolynna Sinanan University of Sydney, Sydney, Australia

Greg Tegart Victoria University, Melbourne, Australia

Kazuhiko Terashima Toyohashi University of Technology, Toyohashi, Japan

Frank Vetere The University of Melbourne, Melbourne, Australia

John Vines Northumbria University, Newcastle upon Tyne, England, UK

Jenny Waycott The University of Melbourne, Melbourne, Australia; The University of Melbourne, Parkville, Australia

Barry Wellman NetLab Network and Ryerson University, Toronto, Canada

Adam Wierzbicki Polish-Japanese Academy of Information Technology, Warsaw, Poland