All that Glitters is not Silver – Technologies for the Elderly in Context. Introduction

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Our present society can be characterized by expectations of reaching old age and thus having a long life: life expectancy has constantly risen for the last 150 years in industrialised countries – mainly due to better living conditions, higher hygienic standards and improved medical care (Schwentker/Vaupel 2011; Hülsken-Giesler/Krings 2015). The high life expectancy we face today is indeed a success for our present ageing society, although it is very often negatively connoted and mainly discussed in the context of a "crisis" in demographic change. Among many similar statistical overviews, the EU Ageing Report 2012 states that "one in three Europeans will be over 65 by 2060. The ratio of working people to the 'inactive' others is shifting from 4 to 1 today to 2 to 1 by 2060" (European Commission 2012: online). The "challenge" of coping with this growing share of "inactive" population has fostered many initiatives by political, social and research institutions (see also Mantovani/Turnheim in this volume)[1]. In the last decades, the field of ageing studies has also driven the attention of scholars from many disciplines in an effort to respond to this alteration in the social structure and in an attempt to reflect and also improve the quality of life for elderly people (e.g. Kriebernegg/Maierhofer 2013; Twigg/Martin 2015). Technological advances have undoubtedly contributed to improve the lives of elderly citizens in numerous aspects and are prominently included in political ambitions to

1 | Especially at EU level, various initiatives focus on the topic of technology and ageing – this volume is also related to findings and actions carried out within three different EU-funded projects: SIforAge (http://www.siforage.eu), Value-ageing (http://www.valueageing.eu), and PACITA (http://www.pacitaproject.eu).

"solve the challenges of an ageing society" – ranging from IT and communication tools over specific care technologies to robot companions.

This volume is dedicated to the role of technologies in an ageing society as "technologies" are, more often than not, explicitly addressed in social and cultural discourses on ageing, aside from being underlying aspects to many facets of an ageing society, such as in the discourse on Active Ageing (Formosa 2013) or more concretely in the field of (new) media (Lövgren 2013). Furthermore we can observe that often the demographic crisis of aging is turned "into a major 'societal challenge'" (Cuijpers/van Lente 2015: 54) which is to be addressed by technical solutions based on innovation. Empirical evidence, however, suggests that the development and use of technologies for the "silver generation" is not as smooth as it is intended to be as regards unredeemed return of investment (Bieber/Schwarz 2011), unintended side effects (Krings et al. 2014) or unexpected social relations and emotions towards technologies (Böhle/Bopp 2014, Turkle 2012, see also Fernández-Ardèvol in this volume). The complex relationship between the ageing individual and technology was already pointed out by Charness, Parks and Sabel (2001), highlighting both the prospective benefits and the potential risks of such an interaction. More recent academic works have likewise perceived the need to shift the focus from the technological to the human aspects to understand the co-construction of the social phenomenon of ageing and the inscribed role of technology in it (Felsted/Wright 2014, Peine et al. 2015, Pelizäus-Hoffmeister 2013).

In this context, it seems crucial to continue emphasizing that the decision to whether a technical solution is "good or bad" cannot be judged from the given technology as such: it rather concerns the question of *how* a technology is integrated in the social surroundings. Furthermore, it is important to broaden one's view to differentiate the range of technologies which are relevant for the context of ageing while avoiding the risk to homogenize the group of old people (Aceros et al. 2015): relevant "aging technologies" are not only the often politically mentioned "care" technologies – such as assistive technologies for the frail elderly. Rather, a range of technological solutions play a role in earlier phases of ageing like everyday technologies, household technologies, communication technologies or biotechnologies. It shows that these also encompass widely familiar technological solutions, which are in turn approached and used by the elderly in a different way from the above mentioned, with relations to their life course and biography that may include

"savvy tech-operators, ambivalent users *and* non-users." (Loe 2015: 141, see also Pelizäus-Hoffmeister and Fernández-Ardèvol in this volume).

The explication about how technologies are used by the elderly is often seen as basis to go a step further into identifying needs and offering technological solutions developed and designed for the elderly, which should specifically suit their needs (e.g. Suopajärvi 2015), a strategy that reflects the evidence that in Western countries technologies, and especially ICT, are increasingly positioned as *the* solution to the problems usually associated with ageing. Although this sounds like a very promising strategy to support policies of "active ageing" at an early stage, the role of technology in elderly people's lives, together with their needs and habits towards it, are not as clear as they should be at first sight but rather require more sensitive approaches to technological development and design (see Marston/Graner-Ray and Biniok et al. in this volume).

Indeed, a recent attempt to bridge the gap between technology and its prospective human users –especially in the field of "care technologies" – was provided by an approach that integrated scientists other than engineers as well as user groups into the technical design and development process. Recent research has, however, shown that this integration is by far not "the end of the story", but rather opens new questions as regards acceptance and integration of differing (scientific) views as well as interpretational sovereignty, and thus power structures in the collaborative design process (Compagna/Kohlbacher 2015, see also Endter and Kamphof in this volume). Especially as regards the field of care, at a political level, we can often still observe a "technology-push" strategy that involves a high prominence of aspects like efficiency or technical feasibility, which does not meet the human complexity of the field (Hülsken-Giesler/Bleses 2015, Mol et al. 2010, Oudshoorn 2011, Weinberger et al. in this volume). "Human complexity" here covers a wide range of factors like personal attitudes towards technology as well as the context in which the technology is embedded, be it the underlying conception of 'care' of the affected groups, the grade of frailty of the elderly (e.g. dementia), or the (national) surrounding in which certain types of technology are introduced (López Gómez 2015, see also Klein et al. in this volume).

Furthermore, technology-based care interventions cause a close engagement of technology with the lives of the elderly without being at all "neutral". Rather, as Peine/Moors put it, "they redefine boundaries (between health and disease, between citizens and patients, between what is considered active and what is not), they limit or enable (sometimes in unexpected ways) agency

in one way or the other, and they define new socio-technical arrangements in which responsibilities, actions and interactions are re-distributed among existing and new stakeholders involved with health and care" (2015: 69).

The above mentioned technological changes as regards boundaries, agency and the socio-technical arrangement as such are relevant for both types of elderly care – stationary and ambulant care. To illustrate this with an application from ambulant care, a widely used and allegedly "simple" technological solution is alarm pendants. Despite their apparent simplicity, empirical research shows how resilient elderly people are to the introduction and use of this technology in practice (e.g. Pritchard/Brittain 2015; López Gómez 2015) and also how the device changes the close private context of the elderly, that is, the "home" in terms of "boundaries" and "agency" of the elderly. The implications of technology use in this field thus go beyond the socio-technical arrangement as such. The case of the alarm pendant can also be used to show the societal contradictions connected with technology development and use "for" an ageing society, as there are a range of underlying discourses leading to the practical introduction of an alarm pendant which are very seldom questioned; first, a discourse in "ageing-and-innovation", and second, a discourse implying that "older-people-want-to-live-at-home". As Neven (2015: 39) points out, these two discourses powerfully merge and strongly guide technology development for the elderly. First, the "ageing-and-innovation discourse" usually states that increasing costs for care, coupled with scarce and overworked personnel and too few places in care homes, pose a major societal problem that has to be solved with technologies. The second discourse Neven uncovers is what he calls an "older-people-want-to-live-at-home" rhetoric (Neven 2015: 43). Both form strongly moral discourses, as they seem to be evidently and undoubtedly "right" and commonly shared by all members of society: a technical innovation allowing older people to live at home – "the preferred 'good' place to live" – at the same time solves a major societal problem and becomes thus the "'evidently right thing to do'" (43). However, this involves the danger that while older people are able to stay at home longer on their own, several factors of social relevance become neglected. For instance, social isolation or loneliness can occur while staying at home with the technology; similarly, and due to the influx of technologies, a loss of control and privacy can arise so that – through the living practice with alarm pendants – the sense of "home" itself might get lost (see also Guihen in this volume). It is thus important to explicate all occurring changes for the elderly through technologies, as seemingly easy

technical innovations might be regarded immediately as 'the right thing to do'" (Neven 2015: 43), while overlooking that technological solutions need to be context-specifically assessed and sometimes need to be altered, as they might not be the best solution for each case.

As mentioned before, dominant discourses of ageing seem to foster a specific understanding of "ageing and technical innovation" at a societal level. It is thus important to shed light on the question of how discourses develop and how they are shaped by societal visions and further distributed through the media. This may concern implicit forms of discrimination of the elderly by not taking up issues publicly, e.g. concerning special age groups. This may also occur if the foundations and roots of thoughts are not made explicit and if current social concepts of ageing are built on a discourse where underlying but guiding visions like "human enhancement" are not reflected upon, which may lead to a narrow "ageist" scope of debate (Faulkner 2015, see Wolbring/Abdullah and Sand/Jongsma in this volume).

Technology policy has already reached the social sector since the last few years, as politically used-terms like "Personal Health System" (Peine/Moors 2015) for ICT based health care services, or the term "Welfare Technology" used in Scandinavia (Östlund et al. 2015) impressively imply. Policy making at European and also at national political levels in this field requires a complex interplay of sometimes opposing strategies and institutions (see Mantovani/Turnheim and Fitzgerald/Adams in this volume). It is therefore important to define – based on societal consensus – which future should be envisioned and approached in relation to technology in an ageing society. It hereby seems crucial to widen the scope towards an approach that interrogates innovation in an ageing society and not only focusses on new kinds of technologies to be developed and designed. Rather, there should be a renewed focus on the agency of politics, societal actors and the elderly themselves. Creating normative visions about what future our society is heading to is therefore crucial in this context (see Hülsken-Giesler/Wiemann 2015, see also Beimborn et al. in this volume).

The above considerations might conclude that the answers to questions that concern the ageing population are not simply new technologies but, on the one hand, a new focus on the agency of the elderly that encompasses their use of the existing technology repertories and also their everyday strategies to maintain autonomy. On the other hand, societal actors should keep an awareness of the overall goal of technology development and design in their agendas, which has no end in itself but rather aims at serving human

beings above all: "Elders […] remind us that ultimately they aim to achieve something akin to comfortable ageing – a lifestyle that emphasizes ease, familiarity, and prudence […]. Technology may or may not deliver comfort or control in their lived experience." (Loe 2015: 145).

Developing on these notions, this book focuses on human interaction with technology in different settings and fields and may thus help us to become more sensitive to the ambivalences it involves. It may as well enable us to adapt technologies to the people and the lives that have created the need for its existence, thus contributing to improve the quality of life of senior citizens. Hereby the scope of this volume is purposefully a wide one: it addresses both different technological fields – such as ICT or robotics – as well as different age groups – the so called "active agers" and frail elderly people in need of care. It involves not only empirically-driven case studies, but also theoretical research papers that specifically attempt to examine this multifaceted interplay between technology and ageing users.

Our volume is divided into three main parts. The first part "Ageing, Technology and (Inter-)Personal Development: Old agers as Technology Users" presents case studies that examine the relationship between various technological developments existing in everyday life (internet, mobile phones, video games or social networks) and ageing users, together with the conditions and meanings ascribed to both these technologies and its users. The second section "Ageing, Technology and Elderly Care: Assistive Technologies", explores the often complex relationship between care technologies and its users, that is, ageing patients, professional caretakers and caring relatives. The last section "Policy making and Discourses of Ageing" interrogates the role of policy makers and observes public and scientific discourses informing the relationship between technology and the elderly.

Despite the undeniable reality that our lives are surrounded and supported by an ever-increasing amount of technological developments and that the ageing population represents an important niche in the technological market, many complexities arise when observing the development of everyday technologies addressed to the elderly and their end users, which are – at least partly – addressed in the first part of the volume, "Ageing, Technology and (Inter-)Personal Development: Old agers as Technology Users". Even when the use of certain technologies is pervasive – as is the case of computers and mobile telephones –, and even when ageing/aged users represent an im-

portant target group for the commercialization of such technologies, user response might be ambiguous, contradictory, or even confrontational. The reasons for this response are multifaceted and may involve a wide variety of factors. As an example of this, *Helga Pelizäus-Hoffmeister's* qualitative study reveals the various motives for and against the use of different technological devices by the elderly to make hypotheses about the extent to which the individual, social and cultural contexts of the users influence their interpretation of technology. The author concludes that bringing in a broad understanding of interpretation and meaning into technology development and innovation is necessary, since at present the focus is much more on technical viability while the view of the user tends to be disregarded. She therefore argues that quantitative approaches which could systemically inform future technology development are still much needed.

A further qualitative evidence of this is provided by *Mireia Fernández-Ardèvol*, who studies the "non-use" of mobile phone among senior citizens (+60) in five cities around the globe with the aim of identifying common patterns of mobile non-use in different social, cultural and economic contexts. She states that "heterogeneity" best characterizes the use and also non-use of mobile phones at this age group in all the cities studied: an acceptance or rejection of mobile phone use is not a static decision. Furthermore, decisions for/against the technology in this context are actively taken, being forms of personal agency in times where one's own decisions are more and more difficult to state.

While mobile telephony is widely used by a high percentage of the population in all ages, a less visible reality is that of female elderly citizens as users of a typically youth- and male-oriented technology such as video games. *Hannah Marston* and *Sheri Rainer-Ray* focus on gaming technology and intergenerational game play: while in the 21st century gaming witnessed a change and broadened its scope to older adults, there is a gap in awareness surrounding game preferences of older women (aged 50+ years). In order to address this gap, a series of workshops were conducted to identify the type of game content older adults would like to play: these are broadly based upon their hobbies and interests, while they interestingly uncover female interests for virtual role plays that allow them to experience emotions and roles different from their everyday lives.

As the previous examples have illustrated, understanding the heterogeneity of contexts and situations in which the elderly live is crucial to enable their access to the resources and services made available to them and, by

extension, their participation in society. As the availability of health care, services and entertainment opportunities is largely concentrated in urban settings, access to these in more scarcely populated areas might be limited or inexistent, thus increasing the risk of isolation and social exclusion. *Peter Biniok, Iris Menke* and *Stefan Selke* attempt to bridge this gap by exploring the use of technological devices and platforms for social inclusion of elderly citizens living in rural areas. The authors present a case study undertaken in the German Black Forest region that develops communication tools in the frame of a user-oriented online platform, which allows further social inclusion and thus a better quality of life for the elderly in that area. With the aim of making the life of senior citizens in rural areas more autonomous, with special emphasis on social inclusion, the authors meet the challenge of putting human beings first instead of technology, starting with a needs assessment that is also aimed at learning about unexpected needs and demands of the elderly (60+) with respect to web-based networking tools.

Our second section, "Ageing, Technology and Elderly Care: Assistive Technologies" is dedicated to assessing the relevance of the variety of potential settings, contexts and situations involved in technologies addressed to the elderly population. Such aspects might become visible when it comes to ensuring comfort and safety while maintaining independence as old agers face increasing health and mobility problems. It thus explores the often complex relationship between such technologies and its users - that is, ageing patients, professional caretakers and caring relatives.

At a national as well as at an international level, several innovation strategies focus on the integration of technology for a higher "efficiency" in care. In its Digital Agenda for Europe, the European Commission's Policies for "Ageing Well with ICT" show awareness of the potential of ICT in assistive technologies for elderly care, as they prognose that government spendings on pensions, healthcare, long-term care, unemployment benefits and education in the EU "will increase by almost 20 per cent, while expenditures for long-term care will double" (European Commission 2012: online). Technology-based research and innovation projects aimed at coping with this expected increase included – inter alia – fall prevention, integrated care, and the AAL Joint Programme. *Cordula Endter* provides an illustration of the materialisation of such policies in the German context by presenting an ethnographic case study that focuses on the development process of smart assistive technologies, also called Ambient Assisted Living (AAL). By conducting fieldwork in different settings – laboratories that design AAL, companies

that provide this service, and households equipped with this technology – the author seeks to understand the social and cultural impact of AAL on the aged population Through an understanding of the interaction of engineers and actors in the design process as a practice, the author reconstructs the transformation of images of the elderly and their needs into a yet invisible technology. Once such technologies have been developed and brought into the market, they are implemented in different contexts, together with their interaction with the needs of the users they are intended to address. Similarly, *Barry Guihen* provides conceptual evidence of the intricacies of that process by observing the use of ICT in developing smart homes for the elderly to support the often strongly longed for ageing in one's own home ("ageing in place"), while revealing the main social and psychological implications involved in the use of such technologies. The author focusses on the human factors and emotions and cautiously elaborates on subjective aspects such as, for example, social isolation, loneliness and frustration, which are often overlooked by those involved in developing ICT-based solutions for supporting ageing in place.

So far we have examined examples of elderly citizens as willing and voluntary users (or not) of technology. In the case of the old agers (80+) and those with an incapacitating illness, issues such as vulnerability, health and safety enter in direct conflict with ethical concerns about privacy and individual consent. The ethnographic study by *Ike Kamphof* provides insights into this controversial matter by observing the role of activity monitoring as a resource used in homecare with people suffering from dementia. She analyses the frail balance between safety and invasion of the patients' privacy when technologically-mediated monitoring is used to enhance their quality of life and prevent potential hazards. Further exploration into this delicate topic is provided by *Nora Weinberger, Bettina-Johanna Krings* and *Michael Decker*, whose qualitative work incisively evidences the challenge that the increasing number of patients with dementia presents in elderly homes. The authors argue that technological developments designed for the elderly often ignore those directly involved in its use. In the case of dementia, this means that the mobility of people should be enabled, while independence must be limited to avoid potential danger for the patient. By proposing, applying and reflecting on an approach that focuses on the needs of (dement) users, the authors strengthen the necessity to re-embed dement patients into social spaces that can cope with their special condition.

All of the authors presented so far agree in the fact that those directly involved in the use of technology in cases of patients with dementia should participate in the implementation and – ideally – in the design of technologies that better address the patients' needs. Likewise, they emphasize that their feelings towards and perception of such technologies need to be taken into account. Evidence on how a technology in a care setting can be evaluated is provided by the joint work by *Barbara Klein, Glenda Cook* and *Wendy Moyle*. The authors present findings from a study of robot therapy with the already classical baby seal "PARO" in three different national research settings (Australia, England and Germany) and demonstrate that interaction with emotional robots can have a positive impact on patients with cognitive impairment when they are provided together with other activities in elderly homes. The authors, however, stress the necessity to continue research on emotional robots as many questions in this field are still not answered.

Given the evidence provided so far, the complexity and variety of interactions between the elderly and the technologies addressed to them reveals an impending need to implement policies in relation to these issues. Our last section, entitled "Discourses of Ageing and Policy Making", thus focuses on current social debates on ageing and how they are applied – or ignored – by governments and institutions when implementing policies addressed to the senior population.

A useful way of navigating among the sea of troubles (and documents) of EU regulations is provided by *Eugenio Mantovani* and *Bruno Turnheim*, who give a comprehensive view on existing European policies on ageing, together with the extent to which public policies are representative of and informed by the views of those agents who represent elderly citizens or by elderly population at large. The authors historically analyse the development of policies for ICT and active and healthy ageing within the EU framework and its related agencies – regulatory actors and agencies, interest groups, research centres, etc. – with an emphasis on whether ethical and moral considerations are taken into account (or not). The authors conclude that current political approaches still lack public deliberation processes, a fact that would be detrimental to reach social legitimacy in this field.

As a complement to this data collection, Ciara Fitzgerald and Fred Adam systematically examine the uncertainties that decision makers face when implementing European telecare policies in the context of a growing ageing population. Based on an analysis of national approaches to telecare in 14 European countries, the authors differentiate uncertainties in the field of policy

making for telecare along the categories of technological mechanics, impact, and societal preferences. The authors argue that such transparent decision support tools offer helpful guidance to decision makers, especially as they will increasingly be challenged to consider a framework of 'responsible innovation' in their policy making efforts.

Institutional discourse on ageing and technology inevitably informs institutionalised attitudes towards it: in this sense, the media provide an apt mirror that reveals perceived notions on the matter. The work by Gregor Wolbring and Boushra Abdullah quantitatively analyses the coverage of the topics of ageing and technology in two Canadian newspapers. By revealing when, where, and in which way technologies are mentioned in relation to ageing, their study seeks to reveal existing media discourses about ageing and technology and discuss it jointly with Canadian key policy documents on aging. Furthermore, in a critical intent, the authors also detect which issues are not taken up by the media, namely the socially disadvantaged elderly such as elderly with disabilities, elderly immigrants and the poor elderly. They argue that the media should take up its educational mission seriously and not only cover these neglected issues, but they should also include relevant policy documents in their reporting. Scientific-philosophical trends on the phenomenon of ageing likewise offer a comparative view that provides an insight into the discourse of ageing in relation to the advances of technology. Martin Sand and Karin Jongsma discuss the vision of Transhumanism, a highly controversial trend of thought that aims at overcoming ageing, illness and mortality in the face of unprecedented technological development. With both philosophical and technological arguments, the authors interrogate the ethical validity of the notions proposed by the transhumanist approach and their goals of research on anti-ageing. Instead they propose a wider understanding of the phenomenon of ageing, not as a simply biological course of physical and mental degradation but as a complex social process.

In view of the many facets involved in the relationship between technological developments and the elderly, it is necessary to take into account a number of ethical issues when it comes to developing and implementing technologies addressed to the elderly. We thus come full circle and return to our initial question of what it conceptually means to take the "human factor" first. A theoretically-driven ethical reflection is provided by Maria Beimborn, Selma Kadi, Nina Köberer, Mara Mühleck and Mone Spindler, who examine the notion of "focusing on the human" from a sociological view point, followed by a clear statement concerning the normative implications of "good

life" and "good care" with technologies. The authors conclude by stating the need for thorough perspectives on the topic, which would not only integrate different scientific fields but also affected citizens in a true transdisciplinary approach.

The articles in this volume have illuminated the complexity of the human factor in the attempt to technically approach the "challenges" of an ageing society. They shed light into the various political, social and personal arenas where the encounters between technologies and elderly people take place. All the contributions set the "human factor" at the center of their analysis and describe the specific outcome of this relationship through sensitive approaches, be it observed in subjective processes of identity formation - how respect and dignity for the elderly can be found in public discourse - or in the transformation of age-related issues into policy processes. Given that all contributions focus on the human factor through various facets, it is high time to abandon the idea that the ageing individual is still seen as a malfunctioning machine whose deficiencies must be diagnosed or as a set of limitations to be overcome by means of technological devices.

To this purpose, the above mentioned contributions open further desiderata for research in the field of technology and ageing. It thus seems important to continue focusing the research on clear differentiations in this field, distinguishing different age groups and different technologies to enable assessments and view on the different roles technologies can take in a specific context. What seems however crucial for the future is to bridge the gap still present between sensitive evaluations and assessments on a context-specific individual level and political solutions guiding further technical innovations, organizational practices and institutional settings in this field.

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