



INTRODUCTION

Critical Reflections on Ageing and Technology in the Twenty-First Century

Chiara Garattini and David Prendergast

BETWEEN 2006 AND 2008, SHORTLY before the global economy was turned on its head, we were engaged in a large-scale, long-term ethnographic research project designed to develop a global, comparative understanding of the practices and meanings associated with growing older (Plowman, Prendergast and Roberts 2009). This study, funded by Intel, the technology company, focused on the experiences and expectations of ageing with a view to help frame the questions being asked to imagine new technologies for supporting independent living. It aimed to analyse, among other things, the multiple meanings of 'home' for older people and the implications for those seeking to deliver services, technology or other interventions.

Dozens of households in many countries each generously gave two days of their time to allow researchers into their lives, sharing their health stories, personal and family histories, social activities and ambitions for the future. Many extraordinary insights emerged from that wealth of data, some of which are covered in this introduction. Certainly any lingering reifications about the homogeneity of older age cohorts, or assumptions about the dependencies of old age or universal technological illiteracy, were quickly exploded. The broad comparative 'Intel Global Ageing Experience Study' later led the team to both directly conduct and sponsor deeper, more focused research projects on a variety of themes around the subject of independent living. This programme of activities brought us into contact with some amazing projects and researchers in many contexts and cultures. It explored how technologies, sensitively designed with social, personal and institutional practices in mind, can help contribute towards building positive experiences in the later life course.

This edited collection is designed to provide a platform for some of the promising and insightful work in this emergent and exciting domain

that is taking place internationally. The chapters in this book cover a wide range of subjects such as social media, robotics, chronic disease management, caregiving, gaming, migration and data inheritance, to name a few. This complex diversity itself reflects the richness of the research on later life. We have organized them into three sections: Connections, Networks and Interactions; Health and Wellbeing; and Life Course Transitions. These themes address some of the major trends in ageing and technology research, but also highlight some obvious limits. Many topics discussed by the chapters overlap across the different fields. Is telecare about health or social connectedness? Can we confine civic engagement through Information and Communications Technology (ICT) in later life to social networking and not to wellbeing? Is e-learning about social interaction, health, or transitioning into the community of ICT and technology users? Can we really separate these domains? We think not. The concepts of ‘being old’ and ‘technology’, albeit very complex and nuanced, are sometimes flattened in easy explanatory categories. In this introduction we would like to unpack both concepts and to start what the rest of the volume will continue to do: highlight the complex relationship between ageing and the use of technologies. The chapters cover a great deal both in terms of technology and social practice. Yet, as we witness rapid developments around how data is collected, analysed, visualized and put into action, it is only the start of a much larger and very important conversation about what we need to consider when designing technologies across the landscapes of the later life course.

Global Ageing in Perspective

In recent years, there has been a great deal of discussion about global ageing. Many consider it to be one of the megatrends of this century alongside rapid urbanization and climate change. The United Nations (UN), in a now famous 2001 report, described the situation as unprecedented, ‘without parallel in the history of humanity’, pervasive, ‘a global phenomenon affecting every man, woman and child’, profound, ‘having major consequences and implications for all facets of human life’, and enduring, with the trend of proportion of older persons expected to continue to rise in the twentieth-first century (United Nations 2001: xxviii *passim*). According to the World Health Organization (WHO) ‘the proportion of the world’s population over 60 years will double from about 11% to 22%’ between 2000 and 2050, with the absolute number of people aged 60 years and over expected to increase from 605 million to 2 billion (WHO 2014: *passim*).¹

This phenomenon, often described in apocalyptic terms in media, government and even academic literature, is the outcome of people living longer combined with a decrease in the number of children they have. While the reasons for having fewer children are complex and highly debated, the reasons why we live longer are easier to agree upon. Amongst others, these include improvements in nutrition and food supply, in public health and hygiene, especially in terms of the way we live and work, and in the advancement of medicine with the introduction of vaccines, antibiotics, and the control of many infectious diseases.

Despite sensational labels such as ‘the ageing time bomb’ and the ‘demographic tsunami’, the fact that we live longer and healthier lives is a great achievement of humanity that should be celebrated. It is wondrous to consider that the first child to live to the age of 150 has probably already been born and that in certain societies, one in every two girls born today can be expected to reach their centenary. It is even more incredible to reflect that human life expectancy has increased by approximately two years for every decade since the start of the twentieth century, and that the additional time, on the whole, involves ‘healthy life years’ for most of the population.

Ageing demographics, of course, do carry great consequences for the way in which complex organizations and societies structurally organize themselves at the macro level and for the dynamic configurations of relationships between individuals and groups at the local level (Vincent et al. 2006). A rapidly ageing population has critical impact on, for example, family structures, intergenerational relations, the length and options for working life, not to mention the financial stability of citizens and economies alike. In the UK, many of the policy commitments and labour expectations agreed as part of the post-war ‘Beverage Reforms’ originally helped to shape perceptions of later life, starting with official retirement at 60 for women and 65 for men. In the UK, as in many other countries, once established boundaries around retirement age and pension rights have been challenged and renegotiated in the panics, contractions and shockwaves generated by the 2008 global economic crisis. To varying degrees throughout Europe and the world, experiments with alternative forms and scenarios for welfare provision are also taking place with targeted eligibility schemes, layered payment options, public-private hybrid models of funding, and initiatives to drive and support the growth of volunteering and collaboration. In patrilineal South Korea, the government has formally overhauled the family law system and attempted to reshape inheritance practices in order to encourage married daughters to become involved in the care of their aged natal parents as the number of sons available, able or willing to take formal responsibility dwindles (Prendergast 2005). Similarly in China, concerns over the erosion of family values and caregiving practices

as a result of rapid uneven urbanization and industrialization is a common topic in the national media. At the time of writing China has 221 million people over the age of 60; one-third of whom are living below the poverty line. Legislative initiatives such as the 2012 ‘Law of Protection of Rights and Interests of the Aged’ are attempting to force offspring to take financial responsibility for their parents whilst limiting and punishing elder abuse. The new law gives aged parents the means to prosecute their own children and, despite much local scepticism, the first court case took place on 2 July 2013 where a 77-year-old woman from the Jiangsu city of Wuxi sued her daughter for neglect. The court ruled in favour of the plaintiff and ordered the daughter to provide financial support and visit her mother in person twice a month.

Also in question is the ability of many of the world’s health and social care systems to cope with the dramatic increase in numbers of often manageable but expensive, multiple ‘non-communicable diseases’ and chronic conditions that often accompany the process of growing old. For health-care specialists and policy makers alike, this issue becomes greatly amplified when discussed in relation to older adults aged 80 years or more. Often referred to as the ‘oldest old’, this is the fastest growing segment of the population, so much so that it is expected to quadruple in size in many countries by 2050 (WHO 2014). This is a major concern as costs and requirements of care associated with frailty, critical health events, falls, social isolation and cognitive decline increase exponentially for this group. A recent OECD report on emerging trends in biomedicine and health technology innovation argues that chronic brain disorders are set to become the number one public health problem worldwide during the twenty-first century. Alzheimer’s disease alone affects one in eight people above the age of 65 and approximately half of those over 85 (OECD 2013).

In such contexts, older people are often explicitly or implicitly represented as non-productive recipients, a ‘burden’ from both an economic and a healthcare system point of view. Even though we acknowledge the challenges that are part of the phenomenon of an ageing population and the frailty that often accompanies those who are older, it is equally critical to recognize that growing old can be an active, healthy, happy, productive stage within one’s life course. As the World Health Organization says, ‘how well we age depends on many factors’ (WHO 2014). There are risks involved in using terms such as ‘old age’ and ‘elderly’ as it can lead to a tendency to misleadingly homogenize and reify a very large diverse population with myriad variegated expectations, resources, and life course experiences (Blaikie 1999; Arbor and Evandrou 1993).

Perceptions of Ageing

Ageing in medical terms has been described as ‘bio-chemical explanations of the pathological deterioration of the human organism’ (Turner 1989: 595). In social sciences however, ageing is understood as the ‘cultural and sociological process by which humans are classified and ranked by reference to their chronology’ (Turner 1989: 595). From this perspective, Turner continues, age and ageing are ‘socially constructed categories for the classification of persons’. Turner is not the only one that has considered ‘old age’ as a problematic category on which many quick decisions are taken every day (Degnen 2007). First of all, as Catherine Dengen noticed, it is broad: it covers a long lifespan with very little internal distinction, unlike other categories of the life course, such as ‘childhood’, that are conceptualized with a more nuanced approach (e.g. ‘infants’, ‘toddlers’, ‘pre-school’, etc.) (Degnen 2007: 69).

Secondly, there is problem of identification: who can be said to be old? People identified by others as old often do not see themselves as such, and being old becomes something that other people are. Degnen defines oldness as ‘relational’, struggling between epistemological (‘old age exists’) and pragmatic (being able to call somebody old) categories of ‘old’, and encourages social scientists to avoid talking about ‘old age’ as a category, and to discuss instead the context of ageing (Versperi 1985, quoted in Degnen 2007: 71). In this sense, ‘[t]he experience of “becoming old” [...] is not “unidirectional”, nor is it distinctive of people who are old. Rather it is intergenerational and reflexive: “the individual moves ... through a spectrum of emotions in which the past, present and future are in essentially unstable combination”’ (Hepworth 1998, quoted in Williams 2000: 61).

Thirdly, ‘old age’ is often charged with negative connotations. Becoming old is broadly considered to be associated with losing strength and independence from a physical, social and financial point of view. There is a danger, for example, in describing older people always on the verge of losing independence, making them into personifications of risk (Lee and Dey 2010).

Even though we do not argue that some of these elements are part of the common process of becoming old, what we contest is the stigma that in our youth-oriented society is applied to the idea of being old. The problem, for example, of associating old age with illness is that it creates a situation where the individuality and uniqueness of a person might be pushed into the background, dominating somebody’s perceived social role. As Graham Scambler famously noted in his discussion of stigma, an assigned ‘label’ can become a ‘master status’ (Scambler 2008: 207).²

There is considerable literature on how stigma impacts people. Yang and colleagues define stigma as situational (e.g. emerging from the interaction

around a situation), as part of a process of ‘cognitive categorization’ (e.g. stigma occurs when the ‘mark’ of an undesirable characteristic is attributed to an individual), and via collective representations (e.g. when cultural stereotypes, local hierarchies, values, etc. are used cognitively to label somebody with undesirable traits) (Yang et al. 2007: 1526). Stigma therefore does not emanate from an individual and is not inflicted on an individual, but instead is the outcome of complex social processes.

Besides the issue of physical frailty, it is also a mistake to characterize those in later life as passive recipients or consumers of resources. In Europe, the population over the age of 50 controls approximately 75 per cent of the wealth, more in the UK and Japan. As Jones et al. (2008) put it,

The cohorts of people retiring now are those who participated in the creation of the post-war consumer culture. These consumers have grown older but have not stopped consuming; their choices and behaviour are the products of the collective histories of both cohort and generation. People approaching retirement, entering retirement, or currently living in retirement will have very different experiences of later life to those of their predecessors. (Jones 2008: 11)

Similarly, it is a significant error for policy makers, academics, marketers, or indeed older people themselves to correlate later life with powerlessness. In terms of the former, older population segments form an increasingly large portion of the electorate and are the most likely age category to actually exercise their right to vote. Lobby groups for and by older people are proliferating and associations such as the AARP (formerly the American Association of Retired Persons) or Age Platform in Europe are deeply involved in central and local politics. In Ireland, various campaigns spearheaded by the Older and Bolder Campaign in 2010 successfully averted substantial budget cuts in basic supports and the state pension proposed as part of the national austerity measures.

Perceptions generated by apocalyptic labels or burden models can also lead to simplistic and often erroneous assumptions about later life as unproductive. The anthropological record is littered with historical and contemporary examples of the economic and social roles played by older people in cultures throughout the world (see for example Spencer 1990; Keith et al. 1994; Sokolovsky 2009). As noted above, people will be increasingly expected not only to work longer into the life course (and many are willing to do so) but also to volunteer and participate in their communities more as welfare and health systems and services adjust to new demographic realities. In practice, many older people continue to work far beyond the statutory retirement age whether in formal employment and consultancy

roles or as community volunteers, childcare providers, or family caregivers. It is difficult to classify as taxpayer burdens the approximately 6 million unpaid and largely invisible carers, many of them older adults, who save the British NHS an estimated £119 billion per annum.³

Downward transmission of resources to younger generations seldom happens in one post-mortem inheritance transfer. Throughout the later life course, wealth and social capital are invested in adult offspring and their families by older people by way of wedding contributions, mortgage guarantees, multigenerational living arrangements, cost of living subsidies and gifting, and looking after grandchildren to enable dual partner income streams.

It is similarly easy to gather examples of older people as community champions, activists and social entrepreneurs. Across Ireland, a programme organized by the Third Age Foundation has seen hundreds of older people flock to sign up as conversational English teachers for immigrant workers and their families. In Australia, a scheme called 'Men's Sheds' was created to provide a venue and reason for older males, some of whom would be otherwise socially isolated, to gather and teach construction skills to younger generations. The products of some of these sheds, such as recycled bicycles, are then sent to low-income countries. In the US, many capable older drivers volunteer for a not-for-profit organization called Independent Transportation Network America (ITNAmerica). This organization was set up to provide a dignified 'arm-through-arm, door-through-door' transport option for adults with mobility issues and an affordable flexible alternative that encourages and enables older people, who feel it is time to give up driving for safety reasons, to maintain independence. This is especially important in areas with underdeveloped public transport systems. To cover costs such as insurance, vehicle maintenance and fuel, the programme, now running in at least twenty-one states across the country, charges transport recipients a basic fee per mile which, providing they book well ahead, is considerably cheaper than private hire alternatives. A technology layer underpins the scheduling, payment and innovative cashless microcredit scheme. Volunteer drivers are awarded mileage credits for their contributions. Likewise, older drivers who wish to give up their cars can donate them to the organization which reciprocates by providing the equivalent value in credits into their personal transportation accounts. In addition to direct purchase of credits, members of the scheme can accumulate credits in a number of other ways including co-payments from participating merchants and healthcare services and through gifts from friends and relatives.

As discussed, ageing has biological, social and, because it happens at a particular point in history, 'generational belonging' dimensions to it (Hagberg 2012). A study of ageing has to be a study of the life course, of

generational cohort relationships, domestic cycles, definitions of middle and late adulthood, and meaning making rather than the study of an entity, 'the old', as a fixed, romanticized body (Cohen 1994: 148). It is our aim to be part of the literature on ageing that counteracts stigma and problematic simplification of 'old people'. Instead we want to conceptualize ageing as a diversified process that does not bend to superficial definitions. It is within the context of this complexity that we want to situate this book on the interaction of ageing people with technologies. But technologies themselves do not escape the trap of simplification, something we will discuss in the next section.

Technologies in Perspective

Across the entire life course new forms of community, methods for keeping in contact, and ways of engaging in work, healthcare, retail, learning and leisure are evolving rapidly with developments in smart phones, web 2.0, cloud computing, the internet of things, online social networking, big data, mobile broadband, and vast gaming universes. Opportunities and forums for social participation are proliferating and content is becoming more visual, interactive, and frequently community or peer led.

Many of the technologies that we are so familiar with today, to the point that we can hardly imagine our life without them, are recent developments. On 30 April 2013 for example, the World Wide Web celebrated its twentieth birthday,⁴ and it was only in 1994 and 1995 that Amazon and Google, respectively, were founded. In comparison, Facebook is even younger, only ten years old at the time of writing. Yet, it is reasonable to say that these technologies have significantly changed the way in which we work, communicate, interact, purchase and access information. It is also reasonable to say that technologies as we know them today have the potential to support us in those areas where it is most needed, such as living healthier, longer, happier lives.

Certain population categories, especially the oldest old, frequently lag behind in adoption and uptake of these new possibilities, and are often perceived to be at risk of becoming marginalized by digital exclusion. Beginning in 2009 the UK's Race Online programme, later rebranded 'Go ON UK', set itself the task of creating a truly networked nation. The campaign argues that despite 90 per cent of jobs in Britain requiring some level of Information Communication Technology (ICT) interaction, 16 million people do not have basic online skills such as emailing, using a search engine and filling out an online application form. Of these, they suggest that around 3 million people should be classified as active resisters

to technology adoption. The first iteration of the campaign suggested in 2010 that 5.7 million people over the age of 65 were offline and estimated that savings of around £1 billion would accrue from moving online just two of the contacts a month this cohort has with government bodies. On the other hand, the 4 million older people that do use the internet spend longer online than any other age group – an average of forty-two hours per month (Race Online 2010, 2012). Likewise in the US, figures from April 2012 suggested that for the first time more than half of all older American adults now have access to the internet. Of these, 70 per cent use it on a typical day and 34 per cent have signed up to social networking sites (Zickuhr and Madden 2012).

When considering ageing and technologies, however, we need to think in terms of complex interactions. Often things appear simple when they rely on social and cultural assumptions that serve as a form of shorthand. These assumptions can be problematic. For example, technology is often conceptualized in opposition to ‘nature’, which implies associations with ideas of ‘progress’ and ‘tradition’, ‘efficient’ and ‘inefficient’, ‘new’ and ‘old’. In this sense ‘older people’ are often represented as ‘not interested’ in technology, within an almost irreconcilable opposition such as in the discussion of the supposed ‘digital divide’ between young ‘natives’ and old ‘immigrants’ (Prensky 2001a; 2001b). The problem, as discussed elsewhere, is that both categories – ‘young’ and ‘old’ – are flattened in this process (Loos, Haddon, and Mante-Meijer 2012). As Eszter Hargittai and Gina Walejko pointed out, not all youth are equally digitally adept (Hargittai and Walejko 2008). Attitudes, education, aptitude, socio-economic background, gender, ethnicity, personality, generational cohort and age all arguably contribute to the diverse ways in which people interact with technologies. Every person has to judge whether learning to use a new technology is worth the effort (Hagberg 2012: 97). We have to balance the right to be included with the right of being excluded.

Also, while technologies carry potential for great benefits, they can carry downsides that people might want to consciously resist. For example, in the area of health they tend to increase a trend, which follows a centuries old thread, of medicalizing every aspect of life. Technologies involve techniques of enumeration and as such carry the risk of what has been called *data-ism* and data-centric biology: people can get caught up into the over-importance of data and what it says about people (Leonelli 2013: 470). They can enable a ‘tyranny of numbers’ that creates ‘risk’ categories and brings forth a potentially problematic biological reductionism of ‘decontextualized probabilities’ (Lock and Nguyen 2010: 26).⁵ The importance of numbers in Western society is rooted in the scientific ethos characteristic of Enlightenment thinking and positivism, whereby ‘the world is made

known through systematic investigation and transformed for the better by means of the application of technologies' (Lock and Nguyen 2010: 19). Technologies are a key component of this process.

Technologies are therefore not neutral, but at the same time we believe it necessary to avoid easy simplification of them as being intrinsically 'good' or 'bad'. Technologies are powerful, and they mediate (and augment) relations and imbalances of power. They often channel and, in our society, embody authority, and because of that it is very important to enable people to have a choice about using technology rather than be used by it.

As well as avoiding the assignation of values to technologies as either 'good' or 'bad', we also want to steer clear of another dichotomy. Technologies are often conceptualized in opposition to people, as being completely separated from them. However, technologies and humanity have a much more complex interaction and nuanced distinction. People have been making tools to solve problems and enhance their lives since the very beginning of their existence, by mastering fire, stone and wood. Part of the issue is that in Western societies, for example, people tend to be imagined as subjects performing actions and things as objects passively receiving them, but this idea can be, and has been, challenged. For example, Material Culture scholars have suggested that, thanks to their materiality which can be experienced through the senses, objects produce effects on people (Tilley 2007: 259). In this sense, they may be attributed what is generally referred to as agency (see Gell 1988), which in simple terms means they are attributed with the capability to perform actions. The idea that things are not merely the recipient of actions that people enact upon them, but instead have agency of their own, blurs the boundaries between subjects and object, things and people (Miller 2005; Tilley 2006). Science and Technology Studies (STS) scholars have also pointed out that objects, including technologies, influence our actions and therefore can be treated as subjects and 'social actors', gaining a status of quasi-objects (see also Latour 1993).⁶

The chapters in this volume discuss technologies in all the complexities highlighted above, for example by exploring robots as social actors, by looking at the effect of telecare devices on people's perceptions of themselves, by investigating the bending of time and space which occurs through digital social media's asynchronous and co-present (and yet distant) interactions, and by considering how fragments of ourselves continue to exist beyond physical death. Different contributions consider the risks of being excluded by the ICT society we live in, and look at ways in which better design of technologies can enable people to find the right information to change or make their lives better, if they wish to do so.

In essence, technologies cannot be understood or treated separately from society, people and politics, or what Dourish and Bell (2011) aptly refer to as ‘the everyday messiness of lived experience’. Much of the discussion on new technologies today revolves around the idea that they produce ‘revolutions’ and ‘unprecedented change’ to society. In this book we wish to acknowledge the novelty of recent developments, and yet avoid tendencies towards technological determinism. We would rather consider technologies as part of the broader social, economic and cultural landscape. People have always created new technologies, and technological innovations, whether it be irrigation, gunpowder, the computer chip or the invention of glass, all of which have had a great impact on people and societies throughout history (Macfarlane and Martin 2002). This is one more, very interesting, chapter that we are living through.

Conclusion

With this in mind, we would like to conclude as we started with some guiding themes and insights distilled from many older voices and accounts from eight countries as part of the Intel Global Ageing Experience Project (Plowman, Prendergast and Roberts 2009). Initially developed for the inventors, engineers and designers of independent living technologies, the six principles below now perhaps serve as a useful reference and critical reflection points for readers exploring the chapters in this collection.

1) *People want to focus on what they can do, not what they cannot.* Many older adults are reluctant to accept a perception of themselves as being or feeling sick or old regardless of their chronological age. Many seek out physical and mental challenges within the parameters of what they can do, pushing boundaries and shunning assistive devices. Whether they use or need assistance, it is essential to develop technologies that help people to do what they want to do, rather than act as reminders, or create real or perceived stigmas of disability, restriction, dependence and lack of control.

2) *Ageing in place means more than staying at home.* Independence for many does not refer to merely dwelling in a private residence, but to being able to prepare meals, shop, work on the garden, take part in community life and remain socially active. Technology can assist in many ways such as enabling mobility, identifying and coordinating trusted providers of home services and helping secure peace of mind both inside and outside of the physical house.

3) *Health perception is not an objective quality.* It is defined collaboratively through social interaction, personal and cultural history and is often the outcome of complex negotiations between all manner of stakeholders, including medical professionals, family members, informal caregivers, peers, friends and neighbours – all of whom may differ in their assessments of the older person's health issue; sometimes with implications for access and control of resources. Cultural, social and political systems also shape attitudes and behaviours related to health.

4) *People often mark the progression of ageing by watershed events* such as falls, change of residence, or loss of a loved one. Monitoring, assessment and early intervention are useful, but people often are in a state of healthy denial about ageing and thus may not be willing to adopt technologies that are not aligned with their desired ways of living. Technologies should be designed to adapt to emergent needs and ability levels.

5) *Healthy aging is inextricably linked to social participation.* Social relationships benefit health. Beyond simple contact and companionship, a sense of belonging to a larger group or community can provide psychosocial security, especially if it is linked to opportunities to be useful, productive and engaged. Nobody of any age likes to feel they are a burden.

6) *Healthcare networks are large and increasingly complex.* Many of the households visited had been forced to learn how to navigate the healthcare system, often during a period of intense pressure due to a critical health event. Several noted that it was unfortunate that they had no place to share their hard-won knowledge. Collaborative user-based technology system should enable sharing and promote peer learning and supports. Homecare technologies of the future should look beyond the vertical relationships between doctor and patient and focus more holistically across the many partners and stakeholders involved in the care relationship.

As we move to explore these issues through a wide variety of contexts it is important to remember that ageing is a complex concept that classifies people relationally from a chronological, generational and cohort perspective. Yet, when interviewed, it is surprising how people seldom admit to feeling old until challenged by critical life course events that have eroded resiliency. Drawing from insights provided in the chapters, this book critically explores how positive ageing might look in the future, if sensitively supported and enabled by appropriate ICT frameworks, and what technological, social and cultural pitfalls are to be avoided as we design for ageing.

Notes

1. <http://www.who.int/ageing/en/> (accessed April 2014).
2. Yang et al. discussed several definitions of stigma (Yang et al. 2007). For example, they reported how for Goffman (1990 [1963]) stigma is an attribute that is deeply discrediting and transforms the person from a whole to a 'tainted, discounted one'. Jones et al. (1984) built on this example to argue how it describes 'a deviant condition identified by society that might define the individual as flawed or spoiled'. Link and Phelan (2001, 2004) proposed a more sociological definition of stigma, whereby stigma is a process that influences and is influenced by the role played by social, economic and political powers (all from Yang et al. 2007: 1525 passim).
3. See <http://www.carersuk.org/news-and-campaigns/press-releases/unpaid-carers-save-119-billion-a-year>.
4. Following a statement by CERN, 30 April 1993 is selected here as the date of the birth of the World Wide Web, as the day on which the technology was made available on a royalty-free basis. See <http://home.web.cern.ch/topics/birth-web>.
5. See also, for example, Greenhalgh's brief discussion of the challenges in fitting the language of Evidence Based Medicine (EBM), defined as 'the use of mathematical estimates of the chance of benefit and the risk of harm, derived from high-quality research on population samples, to inform clinical decision-making', to the complexities of most medical cases encountered in real primary care practice in the UK (2012: 93–95 passim).
6. In his sophisticated discussion on modernity, Latour problematizes, among other things, the (supposedly) Western conceptual dichotomy between Object and Subject/Society. For Latour these concepts are just 'partial and purified' ideas resulting from modernity's attempts at classifying entities. He proposes instead to consider mediators (e.g. agents between the two 'pure forms'), suggesting that we move from discussing a world of objects and subjects to one of quasi-objects and quasi-subjects (Latour 1993: 76–79 passim).

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