

Ageing in a Digitally Connected World: What Lived Experiences Tell Us About Digital Engagement?

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Abstract

Older adults are disproportionately affected by rapid technological advancements. In the UK, nearly 60% of the 11 million adults lacking essential digital skills are over 65 years old. This digital deficit significantly impacts their ability to access vital online services. The paper draws on written evidence submitted to the UK Parliament's inquiry into the Rights of Older People under "Digital Exclusion". We analysed submissions from older individuals, local authorities, age-related charities, training providers and experts, identifying key barriers to older adults' digital engagement. These barriers were categorised as either "pre-use" (before engaging with digital services) or "in-use" (during engagement). Our analysis revealed that financial limitations, lack of ability to engage, and the absence of alternative access methods and protective legislation were the most prominent "pre-use" challenges. Also, the pressure to participate online negatively impacts well-being, hindering initial engagement. "In-use" challenges primarily revolved around the need for basic digital skills training and confidence-building, coupled with website and app accessibility issues. While some of these challenges have been documented for nearly three decades, the strong emphasis on the need for alternatives to access services offers a new perspective on how to mitigate the negative effects of digital exclusion. We conclude by presenting the Innovation for Ageing Societies Toolkit that was created considering the pre- and in-use challenges to help designers and developers empathise with them, linking real stories with capability losses and design consequences.

Keywords: older adults, digital skills, disengagement, design toolkit, inclusive design

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Introduction

The benefits of being digitally connected are immense. Our experience during the COVID-19 pandemic lockdowns has shown us how technologies were pivotal in enabling work from home, conducting remote medical appointments, accessing diverse services, and keeping family and friends connected. However, not everybody is connected or digitally literate enough to carry on essential tasks. For many people in the United Kingdom (UK), the pandemic brought new digital needs, particularly to those who had never or had not recently used the internet, which, according to the Centre for Ageing Better, affected three million people who were offline in the UK at the beginning of the pandemic. Among them, a great proportion (32%) were people aged between 50 and 69, and the majority (above 65%) were aged 70 or over (Office for National Statistics, 2021).

Older adults have been pointed out as the group of people most impacted by technological changes. Older adults' use of digital resources is highlighted as problematic by the two populational representative surveys conducted recently in the UK by Lloyds Banking Group and Nuffield (Lloyds Banking Group, 2021; Yates et al., 2021). Being in the age group with the lowest engagement and digital skills affects how they use essential services provided online (Allmann & Blank, 2021).

Digital Skills Among Older Adults in the United Kingdom

The UK government (Gov.uk) introduced the Essential Digital Skills (EDS) framework in 2018 to assess the digital proficiency of people living in Britain. This framework is built upon the earlier Basic Digital Skills Framework from 2015. Much like other prominent digital skills studies (e.g., Hargittai et al., 2019; Helsper, 2015; van Dijk & van Deursen, 2014; van Deursen & Helsper, 2015) the EDS Framework uses a categorised structure to evaluate competence in specific online tasks. These categories are outlined below:

1. **Foundation skills:** this area assesses skills such as turning on devices; using various devices like computers, tablets, and smartphones; interacting with different input methods like keyboards, mouse, and touchscreens; adjusting accessibility settings; connecting to Wi-Fi; locating applications; navigating websites; creating, entering, and changing passwords; and understanding the need to protect passwords and personal data.
2. **Communicating:** this focuses on the ability to communicate using various online tools, including email, chat, messaging, voice, and video applications. It covers setting up email accounts, composing emails and attaching files, posting messages, images, and videos on social media, and understanding the importance of secure online communication.
3. **Handling information and content:** this evaluates awareness of and the ability to identify untrustworthy online information. It also measures skills in using different search engines, storing information online or using bookmarks for retrieval, and organising digital content.
4. **Transacting:** this measures the capacity to conduct online transactions, including purchasing goods and services, using public services, accessing banking services, completing online forms, and managing bank card details for online purchases.
5. **Problem Solving:** this assesses the use of online resources to find needed information, such as recipes, travel details, and instructional guides.

6. **Being safe and legal online:** this evaluates awareness of security measures for data protection, including password creation, use of two-factor authentication, and the use of antivirus software and other security tools.

The Lloyds Banking Group 2021 annual report utilised the EDS framework to assess the digital abilities of a representative sample of the British population. This research provides data to the UK government's Gov.uk website concerning the nation's digital skills, which helps inform the development of public policies and community programs. As illustrated in Figure 1, the survey categorizes the population into four groups: 1) the digitally excluded, comprising individuals lacking basic digital skills; 2) those at the foundation level, possessing the ability to complete simple, individual tasks; 3) individuals with life EDS, demonstrating skills in communication, information handling, online transactions, problem-solving, and online safety and legality; and 4) those with work EDS, who can meet the digital skill demands of their jobs.

Figure 1

Lloyds Banking Group Survey Application of the Framework on Essential Digital Skills for Life and Work



Source: Lloyds Banking Group (2021)

The survey (Lloyds Banking Group, 2021) revealed that, within the population over 65, nearly 48% have the Life EDS. The others, who **lack** essential digital skills for life, 51% are at the lowest level of digital inclusion (grey section), while 49% possess only foundational digital skills (purple section of the pyramid). The study also identifies other contributing factors to digital skills gaps, such as level of education, retirement status, living alone, and having a disability. Of the 11 million adults over 18 in the UK who **lack** essential digital skills for life, nearly 60% are 65 or older, and more than half (52%) live with at least one impairment. Among those who are retired, live alone, and have impairment, almost 70% lack even foundational digital skills (compared to 51% of all over-65s). It's estimated that 10 million UK residents lack foundational digital skills, and these individuals are primarily concentrated within three groups: 1) those aged 65 and over; 2) people with disabilities; and 3) those without formal qualifications.

Digital Exclusion of Older Adults Over the Years

Digital exclusion among older adults has been a topic very much explored for many years. More than two decades ago, Selwyn et al. (2003) analysed a sub-sample of 352 adults aged 60 or more from a larger household survey in England and Wales and found that computer use was not a common activity among older adults in their everyday lives. At that time, the use of information communication technologies (ICTs) among older adults was influenced by factors such as gender, age, marital status, and educational background. The authors state several intrinsic and extrinsic barriers that older adults faced at that time:

- Being afraid that they could break something or make mistakes
- Lacking skills and confidence to use ICTs
- Limited experience with technology in the past
- Unable to afford to buy a computer, software or internet access
- Lacking support to learn how to use ICTs
- Finding affordable training programs and being impacted by the negative stereotypes that technology was not for them.

The authors mentioned that although there were many challenges, for many older adults, ICTs were not *relevant* as they could carry on their lives without engaging online.

The scenario of adoption of ICTs among older adults has changed since Selwyn et al.'s study, and the role that familiarisation plays has become evident (Wilson et al., 2023; Garcia Reyes et al., 2023). Older adults who have used computers and other devices throughout their lives are likely to have an advantage over those whose pre-retirement work did not involve technology (Hanson, 2011). In general, the number of older people who are users of computers, tablets and smartphones has grown over the years (ONS, 2021; Statista, 2023). The proportion of those aged 75 years and over who are recent internet users nearly doubled since 2013, from 29% to 54% in 2020.

Also, what Selwyn et al. (2003) call “*low relevance*” has gradually changed during the last decades, with a significant change in the most recent years. If in 2003 older people in the UK could manage their lives perfectly well without being online, then now this is not possible anymore. Allmann et al. (2021) quite correctly call our society a “compulsory computing society” in which engaging online is not a choice anymore. In a more complete report, the authors provide details of the ethnographic study conducted among the digital helpers in the libraries of Oxfordshire for two years (Allmann et al., 2021). They present several examples of essential services that were only available online and the impact on people's lives. People were disadvantaged as they did not match two expectations of the “compulsory computing” society: 1) the idea that everyone has a smartphone, and 2) everybody has enough digital skills to use the online services.

In one of the cases presented by Allmann et al. (2021), a lady in her 60s could not access the council housing benefit as she did not have a combination of three essential skills for life (communicating, handling information and being safe online) that are highlighted in the green part of the pyramid (Figure 1). The combination of the three EDS was essential to be able to complete the local authority online form. Moreover, the lady did not have a smartphone, which stopped the process as she needed it for the authentication process. Her example contradicts the assumption that “everyone has a smartphone” and “enough skills to engage with digital services”.

Although we understand that nearly 48% of the older adults in the UK are self-reported as digitally engaged and have at least one of the EDS for life (Lloyds Banking Group, 2021) accounting for those who are in the green part of the pyramid, we want to understand the barriers that are still stopping over 52% of the people 65+ to fully engage online. The lived experiences of older people, as well as people working with older adults, like charities, training services and age-related institutions, or those who offer services to them, like local authorities, as well as experts in the field, may offer a nuanced perspective of the challenges. This might direct efforts in fronts less explored by human-computer interaction and inclusive design research. In this way, we analysed the written evidence submitted to the digital exclusion inquiry as detailed in the next section.

Methods

This paper is part of an ongoing research project that explores the lived experiences of people aged 65 and over who live in the UK. It combines primary research conducted with older adults, through interviews and co-creation sessions, with available lived experiences presented in secondary research. This paper concentrates on the evidence submitted to the inquiry into the Rights of Older People under “Digital Exclusion”, commissioned by the Women and Equalities Committee in the United Kingdom Parliament, which is part of the secondary research in the project. We mapped out what older people, local authorities, charities, training services, experts in the field, and age-related institutions highlighted as barriers to the digital engagement of older adults. The pieces of evidence submitted received an ID (ROP00) as presented in Table 1 and are available in the Women and Equalities Committee enquiry website (2024).

As the inquiry into the Rights of Older People had more than one topic, we analysed the 51 submissions and selected the 32 written evidence that were related to digital exclusion. We conducted a thematic analysis across all the documents submitted.

Thematic Analysis

Thematic analysis is a systematic method for identifying, analysing, and interpreting patterns or themes in qualitative data, generally collected through interviews, focus groups, surveys, and textual records. It can provide considerable insight into human behaviour and perceptions. This method often allows for interpreting complex social phenomena and lived experiences. Bruwn and Clarke (2021) describe thematic analysis as an “umbrella term” encompassing a diverse family of approaches, three of which are: 1) coding reliability thematic analysis, 2) reflexive thematic analysis, and 3) codebook thematic analysis. Each approach offers unique perspectives and techniques, enabling analysis for the specific study needs while maintaining methodological rigour.

This study employs reflexive thematic analysis, a theoretically flexible approach that emphasises the researcher's active role in interpreting the data. Reflexive thematic analysis is an iterative process whereby themes are developed and refined through continued engagement with data. This approach most closely aligns with the objectives of this study, as it allows nuanced exploration of the dataset while acknowledging the critical role of the researcher in shaping the analysis (Braun & Clarke, 2021).

This analysis aimed to describe themes, including their key characteristics and the meaning and importance attributed to them based on the collected evidence. It is grounded in inductive

phenomenology, which is based on an essentialist theoretical perspective following an experiential orientation to data (Byrne, 2022). Inductive reasoning was used to let themes naturally emerge from the diverse dataset, which included governmental reports, case studies, testimonials, and organisational evidence. This method ensured that the analysis stayed closely connected to the lived experiences and insights reflected in the data. The essentialist perspective was chosen to delve into the subjective meanings and narratives presented in the evidence, viewing them as genuine reflections of actual experiences. Additionally, the experiential approach aligns well with the essentialist one by focusing on practical and lived contexts of the issues raised in the analysed materials.

The thematic analysis was performed manually by two researchers using a Miro board. The thematic analysis followed the 6 phases Braun and Clarke (2012) described. These were:

- Familiarising with the data: After a careful review of all the evidence reported by older adults, local authorities, charities, and digital inclusion experts. The important data was highlighted.
- Generating initial codes: After performing systematic clustering of data related to recurring issues. Key quotes were coded to provide lived experiences that empirically support each identified category.
- Generating initial themes: Grouping related codes into broader themes of nature that would point out the relevant patterns.
- Reviewing themes: Scrutinising the codes and themes to ensure the data collected is accurate and relevant; eliminating redundancy and inconsistency.
- Refining, defining, and naming new themes: The theme's names appear brief but explicitly capture underlying data, such as *“Emotional pressures to using technology”*.
- Writing up: Thematic analysis is complemented by direct quotes and examples from the evidence to provide a clear understanding.

As the coding process was conducted by two researchers, they were able to review each other's codes, discuss similarities and differences in classification, until they reached a consensus. A third researcher helped to refine and name new themes. The results are presented below.

Results

The themes that emerged in the thematic analysis were divided into two main areas:

1. “Pre-use”, referring to the most recurrent codes related to barriers and challenges that hinder older people from initiating any digital engagement.
2. “In-use”, related to challenges faced when engaging digitally.

The themes emerged from a combination of related codes on documents based on research conducted by academic experts; others based on lived experiences of older people submitted directly by them to the UK Parliament inquiry, or through charities; others a collection of experiences from not-for-profit organizations dealing with diverse needs of older people and others from local authorities or commissioners working with local authorities dealing with issues related to digital engagement of older adults. All of them give a portrait of the digital landscape in the UK and the impact on older people's lives. Table 1 outlines the evidence reference (ID) related to each theme and the type of source based on who wrote and submitted it.

Theme 1: Issues Related to “Pre-use”

Among the “Pre-use” themes that emerged from data analysis, there were the impact on well-being that hinders older people to initiate digital engagement; costs related to afford a smartphone and broadband; disengagement from services, social activities and other opportunities; the need for alternatives and legislation in place that avoid exclusion. The several pieces of evidence submitted to the inquiry and associated with each theme can be seen in Table 1, and some examples are described below.

Theme 2: Emotional Pressures

This theme explores how digitally excluded people feel about technology and its usage. The codes associated with it are *Loss of confidence*, *Avoidance*, and *Threat from technology* (related to digital skills, but also the cost associated with it). Senior citizens feel threatened by the pressure to use mobile Apps. For example, the recent strategy to replace landline services has been a source of anxiety among some older people as they are losing access to traditional landline services. They mention the stress the digital demand brings in terms of feeling unprotected and the financial burden the additional costs of having a smartphone can represent.

This isn't for my protection at all! The pressure that I am put under is immense! I've had it go wrong twice and it's quite a kerfuffle to put it right... 'Use our app' represents more like a threat that I avoid it like the plague. (older person - ROP0005)

The withdrawal of landline services is a great concern (a plan to migrate all landlines to digital), leaving no choice but to use smartphones. (not-for-profit organisation - ROP0027)

The information in this section has been taken from our Independent Age -September 2023 report on household costs, 'A constant struggle: The impact of high household costs on older people facing financial hardship', which highlighted the impact of the cost of broadband, and the knock-on costs people face if they can't afford to be online. (charity - ROP0042)

Theme 3: Access to Digital Services

This theme explores how a lack of foundational skills and digital devices creates barriers to digital onboarding and engagement. Two of the codes associated with it are *Inadequate digital skills* and *Digital gap*. The lack of skills to use services creates an immense digital gap between older adults and the opportunities available online, from healthcare-related, basic services to socialisation.

Making an appointment with my GP surgery seems so complicated now, I don't like to try. (older adult experience submitted by a charity - ROP0054)

The receptionist told me the procedure is to go online and complete a form. I don't have a computer. (older adult experience submitted by academic expert - ROP0011)

There is currently a significant cohort who do not wish to or cannot (for various reasons) embrace technology. Sadly, life is becoming increasingly hard for the

digitally excluded... Being unable to use technology has significant adverse effects... Reduced quality of life and wellbeing: for example, increased difficulty or impossibility accessing many services and support, from booking medical appointments, getting medicines and banking to supermarket home deliveries - useful for those with reduced mobility... reduced knowledge of local community opportunities, developments and issues. (older person - ROP0023)

Theme 4: Financial Constraints

This theme explores how economic constraints hinder access to the necessary tools to initiate digital engagement. The codes associated with it are *Affordability* and *Economic trade-offs*. Unaffordable digital devices and broadband at home remain a critical challenge among older adults, leading to digital exclusion.

I don't have broadband; I don't understand it, and I want to learn more about it. The cost is far too high and it's too much for what I want to use it for. Social tariffs would be something I'd be interested in if it was explained to me. (older adult experience submitted by a charity - ROP0042)

If we became unable to pay our bills, we would have no choice but to cancel the least necessary service, i.e. broadband. (older adult experience submitted by a charity - ROP0042)

Theme 5: The Need for Alternatives

This theme focuses on creating a comfortable entry point by combining digital and traditional services. Codes like *Technology alternatives* and *Balanced approach* are associated with this theme. Alternatives are suggested to ensure accessibility for older individuals, prioritising in-person engagement alongside digital services. This means that technology could supplement human interactions. For example, the establishment of local banking hubs can offer alternative accessible formats of services, promoting a balanced approach that considers sensorial and cognitive demands and accessibility.

To stop older people from being digitally excluded is to accept our wish for 'digital rejection' and make it illegal for companies, national and local Government organisations to try and force older people, and anyone with poor eyesight or arthritis in their hands, to use compulsory mobile phone apps. (older person - ROP0008)

For older women, we become invisible...we become invisible when it comes to things that we need to keep us healthy, and that's why the fact that we're not able to do some of the online stuff feels unfair. (not-for-profit organization - ROP0010)

Non-online contact options, especially for health services, banking, and utilities. (older person - ROP0040)

Theme 6: Change in Regulation

This theme proposes legal protection and policy initiatives focused on addressing digital poverty and exclusion. There were several codes associated with it, like *Policy solutions*, *National strategies*, *Public demands*, *Human Rights* and others. Several policies were

highlighted in the submissions to prevent digital exclusion through accessible design, offline access alternatives, and governmental coordination to ensure affordable and inclusive solutions. Legal protection against digital coercion, free internet, participatory design, and scam awareness were some of the topics highlighted in several evidence documents. They urged that new policies should be proposed effectively.

Equality law needs to be strengthened to force companies and national and local government organisations to provide ‘reasonable adjustments’ to accommodate the needs of older people, as in theory, they have to for people with a disability, else they will attract a fine proportionate to their profit level. Then none of the above (referring to struggles to use public, banking and many other services) would have happened. (older person - ROP0008)

Having my broadband is my only means of communication with the outside world via email, messages, phone, etc. I cut back on food and cut down on other bills to be able to afford my internet provider. (older adult experience submitted by a charity - ROP0042)

Legislation to mandate offline platforms - banking, utilities, and key services are the areas for offline access that should be available still. (commissioner who works with local authority - ROP0026)

Mandate industry to actively promote social tariffs to customers that are in low-income households, are facing financial difficulties or unable to regularly pay their bills on time. (group of not-for-profit organisations – ROP0049)

It is a basic human right to access information in all its forms, whether that is by TV, radio, newspapers, receiving documentation, on the telephone or from a computer. Just as there is a basic human right to heat, light, water, and food, there must be a basic human right to access affordable and free digital services or non-digital alternatives. (not-for-profit organization - ROP0038)

Theme 7: Impact on Well-being

This theme refers to the effects of digital exclusion on senior citizens' health, feelings of loneliness and the need for support, especially for vulnerable older adults. Two of the codes related to it are *Digital Awareness* and *Social Exclusion*. It calls for recognition that many older adults require support; otherwise, the isolation, digital barriers, and service gaps they face can impact their health and well-being.

Limited internet and technology skills and access to online healthcare information and remote medical services caused unmet needs, isolation, and loneliness. (not-for-profit organisations - ROP0041)

Healthcare providers (should) ensure that older people living with HIV, who may face digital exclusion, have access to online services, removing accessibility and financial barriers. (not-for-profit organisations - ROP0051)

Hold Back Daily Lives

The last “pre-use” theme is crucial regarding building digital inclusion projects to support people facing barriers in an increasingly digital society. The codes linked to this theme are *Funding solutions, Inclusion, Training, Support* and *Wellbeing*. Many senior citizens in the UK are unable to adapt and complete tasks online. Sometimes, their inability to digitally engage is connected to several intersectional factors, including impairments and disabilities. Their struggles demonstrate the need for comprehensive solutions to ensure their inclusion and well-being in this growing digital society.

They make no allowances for disabilities...there is no sympathy or empathy anymore as well as lack of respect. (older person - ROP0009)

Age is strongly associated with digital exclusion, and millions of older people are excluded or limited in how they engage online. One in three people aged 65 or over either do not have, or do not use, the internet at home - approximately 3.2 million people in England. It is important to note that older people from Black, Asian and Minority Ethnic (BAME) communities have the lowest level of digital usage. (not-for-profit organization - ROP0046)

Provide financial support to councils for digital inclusion initiatives. (group of local authorities ROP0034)

Funding community-based projects for device support, staff training, and connectivity. (not-for-profit organisations - ROP0044)

Table 1

The Written Evidence Related to the Seven “Pre-use” Themes

Themes	Evidence ID	Written and submitted by	Evidence source
Theme 1	ROP0032	Dr. Sarah Lonbay, Dr Karen Atkinson, and Carrie Phillips (University of Sunderland), Dr Alisoun Milne (University of Kent), Dr Carole Southall (Northumbria University), Dr Maria Wolmesjö (University of Borås, Sweden), and Bridget Penhale (University of East Anglia)	Academic Experts
	ROP0042	Independent Age	Charity
	ROP0005	P E Stevens	Older Person
	ROP0027	Flourishing Lives	Not-for-profit Organisation
	ROP0054	Age UK	Charity
Theme 2	ROP0020	Dr. Efpraxia D. Zamani, Associate Professor of Information Systems at Durham University Business School	Academic expert
	ROP0023	Maggy Pigott CBE FRSA	Older person
	ROP0038	The National Pensioners’ Convention	Not-for-profit Organisation
	ROP0011	Dr Emilene Zitkus, Loughborough University	Academic Expert
	ROP0015	Dr Robin A Hadley	Older person
	ROP0028	Ms Geraldine Nosowska (Director at Effective Practice), Dr Denise Tanner (Associate Professor at University of Birmingham), and Dr Paul Willis (Associate Professor at University of Bristol)	Academic Experts

	ROP0029	Aberystwyth University and Swansea University	Academic Experts
	ROP0046	Centre for Ageing Better	Not-for-profit Organisation
	ROP0047	Hourglass (Safer Ageing)	Not-for-profit Organisation
	ROP0049	Greater Manchester Ageing Hub	Group of Organisations
	ROP0034	The Local Government Association (LGA)	Group of Local Authorities
	ROP0044	Wakefield Social Digital Inclusion (WSDI) Group	Not-for-profit Organisation
	ROP0041	leader in the end-of-life experience in the UK at Marie Curie	Not-for-profit Organisation
	ROP0042	Independent Age	Charity
Theme 3	ROP0032	Sarah Lonbay, Dr Karen Atkinson and Carrie Phillips (University of Sunderland), Dr Alisoun Milne (University of Kent), Dr Carole Southall (Northumbria University), Dr Maria Wolmesjo (University of Borås, Sweden) and Bridget Penhale (University of East Anglia)	Academic Experts
	ROP0040	Name Withheld	Older Person
	ROP0042	Independent Age	Charity
	ROP0008	Hilary Leighter	Older Person
	ROP0010	The Scottish Women's Convention (SWC)	Not-for-profit Organisation
	ROP0011	Dr Emilene Zitkus, Loughborough University	Academic Expert
	ROP0020	Dr. Efpraxia D. Zamani, Associate Professor of Information Systems at Durham University Business School and Dr Paul Willis (Associate Professor at University of Bristol)	Academic Experts
	ROP0028	Ms Geraldine Nosowska (Director at Effective Practice), Dr Denise Tanner (Associate Professor at University of Birmingham),	Academic Experts
	ROP0015	Dr Robin A Hadley	Older Person
	ROP0026	Older People's Commissioner for Wales	Work with Local Authorities
Theme 4	ROP0029	Aberystwyth University and Swansea University	Academic Experts
	ROP0038	The National Pensioners' Convention	Not-for-profit Organisation
	ROP0040	Name Withheld	Older Person
	ROP0046	Centre for Ageing Better	Not-for-profit Organisation
	ROP0041	Marie Curie	Not-for-profit Organisation
	ROP0044	Wakefield Social Digital Inclusion (WSDI) Group	Not-for-profit Organisation
	ROP0049	Greater Manchester Ageing Hub	Group of Organisation
	ROP0054	Age UK	Charity
	ROP0056	Equality and Human Rights Commission	Work with Government
Theme 5	ROP0008	Hilary Leighter	Older Person
	ROP0015	Dr Robin A Hadley	Older Person

	ROP0026	Older People's Commissioner for Wales	Working with Local Authorities
	ROP0034	The Local Government Association (LGA)	Group of Local Authorities
	ROP0036	British Geriatrics Society	Not-for-profit Organizations
	ROP0038	The National Pensioners' Convention	Not-for-profit Organizations
	ROP0041	Marie Curie	Not-for-profit Organization
	ROP0049	Greater Manchester Ageing Hub	Group of Organisations
	ROP0011	Dr Emilene Zitkus, Loughborough University	Academic Expert
	ROP0020	Written evidence submitted by Dr. Efpraxia D. Zamani, Associate Professor of Information Systems at Durham University Business School	Academic Experts
	ROP0023	Maggy Pigott CBE FRSA	Older Person
	ROP0042	Independent Age	Charity
	ROP0029	Aberystwyth University and Swansea University	Academic Experts
	ROP0058	The London Age-Friendly Forum	Group of Organisations
Theme 6	ROP0029	Aberystwyth University and Swansea University	Academic Experts
	ROP0047	Hourglass (Safer Ageing)	Not-for-profit Organisation
	ROP0051	National AIDS Trust	Not-for-profit Organisation
	ROP0034	The Local Government Association (LGA)	Group of Local Authorities
	ROP0023	Maggy Pigott CBE FRSA	Older Person
	ROP0041	Marie Curie	Not-for-profit Organisation
Theme 7	ROP0041	Marie Curie	Not-for-profit Organisation
	ROP0040	Name Withheld	Older Person
	ROP0034	The Local Government Association (LGA)	Group of Local Authorities
	ROP0044	Wakefield Social Digital Inclusion (WSDI) Group	Not-for-profit Organisation
	ROP0054	Age UK	Charity
	ROP0008	Hilary Leighter	Older Person
	ROP0009	Name Withheld	Older Person
	ROP0010	The Scottish Women's Convention (SWC)	Group of Organisations
	ROP0026	Older People's Commissioner for Wales	Work with Local Authority
	ROP0049	Greater Manchester Ageing Hub	Group of Organisations
	ROP0012	55/Redefined	Company
	ROP0023	Maggy Pigott CBE FRSA	Older Person
	ROP0035	Leadership for Today (L4T) Ltd	Company
	ROP0046	Centre for Ageing Better	Not-for-profit Organisations

Issues Related to “In-Use”

Among the “in-use” themes, the following were the most recurrent in the evidence submitted (see Table 2).

Theme 1: Building Confidence

This theme is related to developing a confident approach to digital services, emphasising the benefits that digital technologies can bring to daily life. Some codes related to it are *Empathy-driven solutions* and *Enhanced Quality of Life*. Among crucial points to build confidence among older adults are the design of accessible and safe services based on their actual needs, development of user-friendly health technologies, and a constant emphasis on the benefits of online resources and activities to enhance quality of life.

You’ve got to be careful with technology - that it’s a false sense of security. (older person - ROP0015)

All levels of government provide support for people to get online – whether through improving their digital skills or the provision of social tariffs for broadband... Age is strongly associated with digital exclusion, and millions of older people are excluded or limited in how they engage online. One in three people aged 65 or over either do not have, or do not use, the internet at home - approximately 3.2 million people in England. (not-for-profit organisation - ROP0046)

Theme 2: Training Programs and Facilities

This theme is related to the essential measures and support programs to develop skills and provide services that enable comfortable navigation in the digital world. Two of the codes associated with it are *Staff training* and *Senior-citizen training*. There is a need for buddy schemes, like digital helper programs that were available in public libraries; training on digital skills and safety online, providing trustworthy and dignified support for digital engagement.

I would be anxious to know, to learn how to use the Google map to start with or something like that. Or some of the apps, common apps. But there's no one to teach me as such. (older adult experience submitted by academic expert - ROP0011)

Develop and deliver digital training for older adults, in age-friendly environments. Training should focus on developing skills and confidence, as well as online access. Promote the support that is available already as it may be that older adults are not aware of what is available. Promote opportunities for inter-generational collaboration on the sharing of digital skills and knowledge. (academic expert - ROP0050)

Theme 3: Accessibility Regulations

According to several pieces of evidence submitted, there is a need for regulations on accessibility barriers, financial constraints, poor infrastructure, and the shift of essential services online, worsening the conditions for older adults. The codes related to it were *Lack of Alternatives*, *Usability* and *Accessibility*. High-priority services like healthcare, banking, and utilities need to have accessibility regulations considering the cognitive and physical

disabilities of older population. Many older people have a digital device but are unable to use it well due to the lack of consideration for accessibility features. Thoughtful digital design decisions are needed.

Poorly designed websites: Small fonts which become hard to see. The poor colour contrast of the text and background making it hard to read. Logouts on websites for users with slower movements can be time-consuming and frustrating. (commissioner who works with local authority - ROP0026)

Table 2

The Written Evidence Related to the Three “In-Use” Themes

Themes	Evidence ID	Written and submitted by	Evidence source
Theme 1	ROP0015	Dr Robin A Hadley	Older Person
	ROP0023	Maggy Pigott CBE FRSA	Older Person
	ROP0046	Centre for Ageing Better	Not-for-profit Organisation
	ROP0027	Flourishing Lives	Not-for-profit Organisation
	ROP0020	Dr. Efpraxia D. Zamani, Associate Professor of Information Systems at Durham University Business School	Academic Expert
	ROP0050	Faculty of Public Health	Academic Expert
	ROP0011	Dr Emilene Zitkus, Loughborough University	Academic Expert
	ROP0010	The Scottish Women’s Convention (SWC)	Not-for-profit Organisation
	ROP0029	Aberystwyth University and Swansea University	Academic Expert
	ROP0032	Dr. Sarah Lonbay, Dr Karen Atkinson, and Carrie Phillips (University of Sunderland), Dr Alisoun Milne (University of Kent), Dr Carole Southall (Northumbria University), Dr Maria Wolmesjö (University of Borås, Sweden), and Bridget Penhale (University of East Anglia)	Academic Expert
Theme 2	ROP0035	Leadership for Today (L4T) Ltd	Company
	ROP0044	Wakefield Social Digital Inclusion (WSDI) Group	Not-for-profit Organisation
	ROP0045	Anchor	Not-for-profit Organisation
	ROP0015	Dr Robin A Hadley	Older Person
	ROP0012	55/Redefined	company
	ROP0020	Dr. Efpraxia D. Zamani, Associate Professor of Information Systems at Durham University Business School	Academic Expert
	ROP0043	Name Withheld	Older Person
	ROP0040	Independent Age	Charity
	ROP0047	Hourglass (Safer Ageing)	Not-for-profit Organisation
	ROP0056	Equality and Human Rights Commission	Work with Government
Theme 3	ROP0026	Older People’s Commissioner for Wales	Work with Local Authority
	ROP0040	Name Withheld	Older Person

Discussion

The results described above highlighted two stages for digital engagement that require attention to ensure inclusive societies: the “pre-use” and the “in-use”.

First, in the “pre-use”, the emerging themes highlighted challenges that disengage older adults before starting any online service. The examples range from 1) the high costs of digital devices and broadband to 2) the exclusion caused by the inability to use essential services (e.g. healthcare-related) or the missed social activities and other opportunities. Both can be sources of stress, negatively impacting their health and well-being. Additionally, both lead to the need for alternatives and legislation in place that avoids exclusion.

Second, in the “in-use” stage, the themes emerged, highlighting barriers that people over 65 face when using online services that limit or even stop them from engaging further. Several written evidence presented examples of such challenges across their communities, whether they cannot find digital training or struggle to navigate poorly designed interfaces.

The outcomes of the analysis of the evidence submitted by older people, academic experts, charities, not-for-profit organizations, local authorities and companies reinforces some of the needs that were described more than 20 years ago by many authors investigating digital skills and online engagement since then (e.g. Choudrie et al., 2010; Garcia et al., 2023; Hanson, 2011; Hargittai et al., 2019; Helsper, 2015; Selwyn et al., 2003; van Dijk & van Deursen, 2014; van Deursen & Helsper, 2015; Wilson et al., 2023, among others). Among them is the fact that many older people lack digital skills and confidence. Also, the high costs of devices and internet access, as well as the lack of training and support to learn how to use ICTs, are still evident among the experiences analysed.

Although the written evidence reinforces old challenges, there are interesting points highlighted by them that open fronts for considerations by human-computer interaction and user-experience design communities. For example, when Selwyn et al. (2003) conducted a study, some older adults did not see the relevance of ICTs in their daily lives. They could manage their lives perfectly well without them. Now it is different, we live in a compulsory computing society, a much more connected society than 20 years ago, in which essential services, like public and healthcare, are offered online and, in some cases, online only. This continuous need for digital engagement can cause distress, exclusion from services and even social isolation. All of them can negatively impact the health and well-being of older adults. *This link between health, well-being and digital engagement is something not much explored in literature that deserves attention.*

Also, it is interesting to find that the written evidence highlights the intersectional factors of being excluded from or having limited access to digital services. Older adults' low-income impacts access to devices and broadband. The evidence confirms the cases highlighted in the Oxfordshire Digital Inclusion Project Report (Allmann et al., 2021), in which people who did not have smartphones and broadband at home were unable to access services only available online. They might represent the issues found by a great proportion of the 52% of people aged 65 and over who do not have life EDS and who are at the bottom of the pyramid (Lloyds Banking Group, 2021). Nevertheless, the outcomes highlight other factors, like disability impacting access, as well as impairments such as vision and dexterity playing against digital engagement. Also, ethnically diverse older people have the lowest level of

digital usage. *The intersectional factors impacting digital engagement must be further explored and alternatives must be thought of to accommodate diversity.*

The complexity of the tasks associated with engaging online can be a barrier. Therefore, the need for alternatives so much highlighted in the submitted evidence is a sign that other ways to access services must be in place. We may need to consider new alternatives, ranging from exclusively non-digital interfaces to the lowest possible level of interaction.

Non-inclusive Interfaces

Another old challenge highlighted in the pieces of evidence was related to the accessibility of the digital interface. People within the excluded population have a range of different problems, physical, sensorial and cognitive capabilities, skills, past experiences, needs and opinions well stated in all the evidence presented in Table 2 under Theme 3 and in Table 1 under Theme 4.

To make informed design decisions one needs to see beyond the typical misguided perspective that people are either disabled or fully able. The challenge is to enable creators of new interactions to incorporate inclusive design elements addressing accessibility and usability effectively as well as considering potential offline alternatives.

Innovation for Ageing Societies Toolkit

To support designers and developers in designing for inclusivity, we have started the development of an innovation for ageing societies toolkit, based on the initial findings of our ongoing research project. The toolkit was created considering the “pre-use” and “in-use” challenges to help designers and developers empathise with older adults’ needs. It is a collection of cards that combines real stories with capability losses and design consequences. Figure 2 presents some of the cards created for the toolkit.

Figure 2

Innovation for Ageing Societies Toolkit: Some Cards Linking Case Studies With Losses of Capability and How Design Can Enhance Interactions



The cards present a range of capabilities that might change as we age. It addresses vision, hearing, dexterity, cognition and mobility. It notes that older adults may experience a reduced ability to see fine details, distinguish between light and dark, and differentiate colours. Similarly, ageing can affect the ability to locate sounds and can cause hearing loss. Moreover, grip, hand strength, precision, and joint mobility are some of the big dexterity challenges we may face as we age. Additionally, issues such as memory loss, reaction time, information processing speed and complexity of tasks are some of the cognitive problems that can slow daily activities of older adults. They are all considered in the cards, with examples of design features that can be used to address such problems.

As stated by Hanson (2011), the design plays a critical role in engaging users. In the case of older adults, the consideration of the needs and abilities of a wide range of older users can help to mitigate the challenges associated with age-related changes. The toolkit is unique as it uses older people's stories to build empathy, whilst demonstrating how creators can use inclusive design principles to develop products that are more satisfying, accessible, and reach a wider audience.

Recommendations for Future Research

As technology continues to advance, it will be important to identify and address the challenges that older adults face. We highlighted the connection of digital engagement to health and well-being, as well as the impact that intersectional factors might have in excluding the most vulnerable older adults. In-depth research to further understand them and how lived experiences keep older people digitally engaged or disengaged is still necessary.

Conclusion

In analysing the 51 pieces of written evidence submitted to the inquiry into the Rights of Older People concerning “Digital Exclusion” in the United Kingdom Parliament, we gained a nuanced understanding of the challenges faced by older adults in today's “compulsory computing society”. The lived experiences shared by older adults, charities, not-for-profit organisations, academic experts, local authorities, and companies illuminate the reasons why over 52% of individuals aged 65 and older in the UK struggle to engage fully online.

Among the findings, two particularly stood out:

- 1) Unlike the past, when people could manage their lives without being online, today's society places continuous pressure on individuals to engage digitally. This can lead to distress, exclusion from essential services, and even social isolation, all of which negatively impact the health and well-being of older adults.
- 2) The evidence indicates that factors such as low income, disability, impairment, and ethnicity affect how individuals engage with digital services. Although these factors are often discussed separately, their intersection suggests that the more of these issues older adults face, the more dependent on others they will be to use digital services. *This insight could guide further exploration in the fields of human-computer interaction and inclusive design research.*

These findings, along with other outcomes related to costs of smartphones and broadband services, as well as the lack of support and training, highlight the need for alternatives, such as offline and in-person services, and improved interaction design. There is also a need for legislation to prevent exclusion.

While we recognise the structural issues that policymakers must address, we believe that accessibility and inclusive design information, as well as case studies, can build empathy and enhance design practices. Therefore, we conclude by presenting a toolkit we have developed to assist designers and developers in innovating for ageing societies.

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The authors have no competing interests to declare that are relevant to the content of this article.

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