

Age Inclusive Digital Platforms

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As services increasingly shift online, older people need to utilise more digital technology. However, many digital platforms still lack the inclusiveness required for all older people to use and engage with them. Some using technology frequently meet a digital world unsuited to their cognitive, sensory, functional and socio-emotional abilities. So, their digital experience seldom aligns with their digital literacy, or personal wants and needs. As most digital platforms are not designed for older people, they are more likely to require assistance to use them. This can impact financial resilience, health, and sense of belonging. To encourage platform developers to utilise an inclusive design approach, to better consider the needs of older people, we created guidance for developing age-inclusive digital platforms. This involved focus groups, interviews, and user testing. We analysed older peoples' use cases, interviewed development teams and reviewed best practices worldwide. This resulted in a Hebrew-language booklet for developers and designers, which we recently translated to English. With initial adoption, we are starting to see these principles implemented in Israeli government and municipal digital services. We hope to create further meaningful change in the usability of digital platforms to improve the lives of older people, including our future selves.

Keywords: *user experience; inclusive design; older people; digital*

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Introduction

Globally the 65+ age group is expected to increase from 9% in 2019 to 16% by 2050, more than doubling from 727 million to 1.5 billion (UN, 2020). These older people are adopting technology more than ever before. So, the Internet, smartphones, tablets, wearables, smart TVs and speakers are being used by a growing number of older people. During the Covid-19 pandemic, this trend became even stronger. In the UK, 54% of people 55+ have been using more online services since the start of the pandemic, with 17% signing up to at least three new online entertainment, socialising, or shopping services (Santander, 2020). Older people are increasingly motivated to use digital technology, for example, 38% of older Americans recently described the Internet as essential (Pew, 2021). However, many older people still lack Internet connectivity or the skills to use technology, in a way that would enable them to consume digital services. It was recently determined that 22 million older Americans are still not online. With people 75+ particularly likely to say they need help with new devices. With 66% saying they usually need help setting up a new computer, smartphone, or other electronic devices, compared with 48% of those aged 65 to 74 (Pew, 2021). This and other challenges lead to less usage of digital platforms. In Israel, the underutilisation of basic digital services by older people (65+ years old), compared to younger people (20-65 years old), is well documented, as summarised in Table 1.

Table 1. Social Survey 2020: The percentage of younger and older people that make use of basic digital service types - summarised from (Central Bureau of Statistics, 2020)

	Search for information	E-mail	Banking and paying bills	Shopping or online services	Online government services	Social media
Younger People (20-65)	77%	77%	68%	52%	52%	90%
Older People (65+)	55%	46%	37%	20%	26%	69%

This difference demonstrates the broader problem of the Digital Divide, when different groups in society have different levels of access to digital technology (Cullen, 2001). While the inequity of the Digital Divide begins with differential access, it leads to inequity in opportunities for economic mobility and social participation (DiMaggio *et al.*, 2004). This can have major impacts on mental and physical health, as well as their ability to function in and contribute to society. Therefore, overcoming the Digital Divide, with regards to age, can improve labour opportunities; economic efficiency and productivity; ease of activity, connection and leisure; ability of individuals to access health services and other public services; etc (Khvorostianov, Elias and Nimrod, 2012). The challenge is not only to empower older people by providing access to digital technologies and enhancing digital literacy, but to ensure age-friendly design and relevance of digital services that embrace the diversity of ageing populations. Currently, many digital platforms do not meet the needs and abilities of older people. For example, it was reported that 40% of older people feel that the design of technology does not consider them

(Kakulla, 2022). Furthermore, older people are twice as likely to abandon a digital task than younger people, and 30 seconds earlier than their younger counterparts (Petrovčič, Rogelj and Dolničar, 2018; Chisnell and Redish, 2005). While accessibility requirements assist with the challenge, they generally do not exhaust the usability potential of digital platforms. For example, many sites and apps satisfy accessibility criteria, but then fail usability tests (Petrie and Kheir, 2007). So, the focus should be on improving usability to close the gap left by accessibility requirements (Johnson and Finn, 2017). Some older people suffer from cognitive, socio-emotional, and sensory changes that affect the way they perceive and use digital platforms. Compared to younger users, they may perform worse on tasks that require memory, be more easily distracted, require more time to study new tasks, use different search strategies, and make more mistakes or perform more random actions (Bergstrom, Olmsted-Hawala and Jans, 2013).

The remainder of this paper is organised as follows. The next section (2) considers the study design for developing the design guidance for age-inclusive digital platforms. The following section (3) presents the results, and the final section (4) discusses the conclusions.

Study Design

Introduction

The Joint Distribution Committee (JDC) is a global Jewish humanitarian organisation. The goals of JDC Israel, also known as The Joint, include promoting quality of life and equitable opportunity, narrowing socioeconomic inequities. One of their programmes is the Digital Literacy for Older Adults initiative, in partnership with the National Digital Agency, which has operated over the past four years. It aims to put technology in the hands of older people to achieve meaningful outcomes, empowering them in their personal lives. The initiative is achieving its goals by improving digital literacy through training; providing tablets and Internet connectivity to those with decreased functional ability, economic difficulties or that are homebound; and providing the tools, knowledge and best practices for age-inclusive digital platforms. Thus far, more than four thousand older people and one thousand professionals have been trained.

A number of principles have been formulated for designing and adapting digital platforms to include older people. Some include the issue of accessibility and relate to the areas of universal, inclusive and person-centred design generally. While others include aspects unique to older people, which originate from psychosocial features and low digital literacy levels. We aimed to consolidate this existing knowledge and make it more accessible to professionals to improve usability in practice. Providing them with best practice and practical tools, to ensure their digital platforms are inclusive, especially age-inclusive.

The translation of the guidance to English was done in collaboration with the Royal College of Art (RCA), which will be described further in subsection 2.3. The RCA has a long history of Inclusive Design, dating back to the 1990s, where Coleman and colleagues introduced this then new approach to design for ageing. In which, it was essential to move beyond considering ageing as just bodily needs and medical decline, instead, considering people's lives holistically when designing (Coleman, 1994; Clarkson and Coleman, 2015). An integral part of the programme consisted of training future designers, i.e. design students, to engage with older people through inclusive design.

Methodology

We conducted a literature review including (Morey *et al.*, 2019; Silva, Holden and Jordan, 2015; Lee and Coughlin, 2015; Petrovčič, Rogelj and Dolničar, 2018), as well as non-academic literature such as (Kane, 2019). We consulted a focus group, 8 participants aged 65-80, who were asked for their feedback on a set of examples with regards to the User Experience (UX) design. We also conducted usability testing for a small number of essential digital public services, including healthcare, banking, email and local municipalities. These were done with 8 participants, both male and female, aged 65-85, who had low to medium digital literacy, for which the main challenges were observed and documented. We also conducted 20 in-depth interviews with leading Hebrew speaking industry UX professionals and academic researchers. Integrating the literature analysis, participant feedback (frequency of comments, and criticality of elements to complete tasks) and expert interviews, we identified the five most critical issues for developing digital platforms to increase usability for older people:

1. visual aesthetics
2. wayfinding, navigation and information architecture
3. microcopy and UX writing
4. flow, friction and feedback (navigation)
5. motor aspects (interface operation)

We subsequently organised 5 learning groups in response, with UX professionals and academic researchers recruited through open invitations on social media. For the 112 who responded, we divided them across the learning groups according to their experience of digital platform development for older people. So, there were a similar number of those with different levels of experience in each group. They were asked to share their experiences with usability testing and best practices, as well as examples of failure and success. An older person was invited to join each group, to contribute their own perspectives. Five meetings were held in total, one for each group, which were recorded and analysed, grouping the main insights into key themes. Subsequently, 20 key participants from the learning groups were asked to join our existing expert group, of UX professionals and researchers, in validating our guidance. They were asked to comment on the structure of the guidance and chapter content, as well as the accessibility and usefulness of the guidance itself.

Subsequently, the Hebrew guidance was translated to English to reach additional audiences. This was assisted by collaborators based in the field of Inclusive Design, ensuring that the intended inclusiveness remained in the translation. The translation of the language and culture is described in the next subsection 2.3.

Translation

Cultural translation is the practice of translation while respecting and acknowledging cultural differences. As culture gives birth to language, translation and culture are intimately connected. Meanings in both source and target languages are profoundly affected by their cultural context. A phrase that appears easy to translate may actually contain cultural subtleties that, unless they are accounted for, can bring just the opposite meaning than is intended. So translation without deep cultural context can be dangerous, especially when meanings are critical (Carbonell, 1996; Aixelá, 1996). Translation plays an important role of crossing through different cultures and communication. Therefore, it is one of the essential, fundamental, and adequate ways of transferring culture, but there are some limitations, including censorship and even culture itself. So, a good translation should simultaneously be aware of the cultural factors, such as views and tradition, to consciously consider the

chronological ordering and explicit meaning, as well as historical and cultural background contexts (Abbasi, Hossain and Owen, 2012).

In practice, our language and culture translation involved a first stage by a native Hebrew speaker, who spoke English as a second language, which was primarily language translation. Then, a second stage, by native English speakers, which was primarily cultural translation. This stage involved determining the typical terminology in context, changes from writing orientation, as well as American and British language differences. For example, when referring to online services and websites, the typical terminology is digital 'platforms' rather than 'products'. The American and British language differences were more nuanced, especially when considering an international audience, and beyond spelling differences. While American English may be globally dominant in terms of spelling, British English terminology regarding smartphones is globally dominant. For example, the word 'mobile' or term 'mobile phone', rather than 'cell' or 'cell phone'. There were also potential cultural differences regarding intergenerationality and technology adoption that had to be considered.

Results

The guidance was divided into 5 chapters, corresponding to the required stages in digital platform development (Halperin Ben Zvi, 2021). Each chapter presents a true story demonstrating an issue in the lives of older people using digital platforms, which is followed by an explanation of its significance and guidance for managing it. The guidance also provides information regarding the changes that occur with age, and their implications for the behaviour of older users.

Information Architecture, Orientation & Navigation

As age increases, sometimes, the speed of information processing decreases, taking longer to absorb, comprehend and perform certain actions (Anstey and Low, 2004). Also, many people aged 65+ find it difficult to ignore distractions, and are more prone to perform random actions, including unintentional clicking. Some feel insecure and unable to orientate themselves within digital environments. Therefore, inclusive information architecture principles should be observed when designing digital platforms, with the main guidance for designing better information architectures and hierarchy formation as follows:

- refine the required actions and include shortcuts
- rely on recognition to ease navigation:
 - o allow going back
 - o design clear navigation buttons
 - o remain consistent, and provide hints for their location (within the process)

Microcopy & User Experience Writing

Many older people rely on the written word of digital platforms, usually reading more carefully than younger people, who rely more on usage habits and familiarity (Fan, Zhao and Tibdewal, 2021). Therefore, text should be concise and well placed throughout the user journey to strengthen a sense of success and capability. For example, clear articulation of error messages, including instructions for repair actions, strengthens the sense of efficacy for older (and younger) people. This is because it helps them cope with uncertain situations, reducing the risk of

abandonment. The following guidance helps with writing microcopy and design messages to provide high usability, allowing older people to enjoy using it successfully (as demonstrated in Figure 1):

- Direct 'down-to-earth' writing - familiar words, with clear and simple phrasing.
- Add dialogue messages and success feedback, especially during uncertainty in the user journey, including reassuring notifications upon successful actions.
- Accurate and clear error messages with a call-to-action - explaining the type of error in plain language, and providing a choice between responses, including explicit instruction for a solution and the call-to-action.
- Control the rate of progress when possible, best avoid messages (pop-up/toast) that appear and disappear on their own. Instead, allow the user to confirm or cancel action.

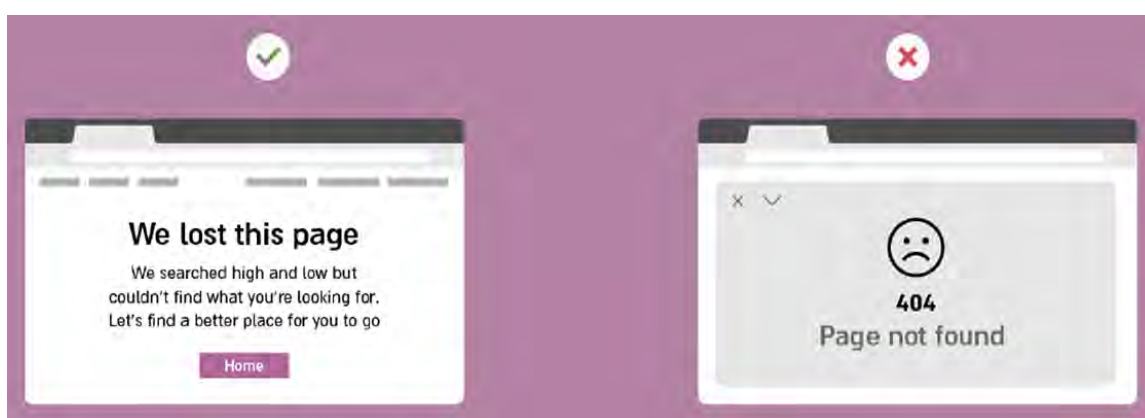


Figure 1. Example Microcopy & UX Writing Guidance: A better design for the common 404 error

User Interface & Design Decisions

Many older people experience decreased eyesight (Freeman *et al.*, 2007), including difficulties seeing up close (age-related farsightedness), as well as differentiating between certain colours and the hues of a colour. Also, many do not use accessibility add-ons and do not change device settings, which can make usage much easier. So, a good choice of colours, fonts, and size of objects allows older users to use digital platforms more easily. We have developed 6 simple principles to follow, building upon the WCAG accessibility standards (W3C, 2008; 2018). Implementing these principles at the early stages of digital platform design will help older and younger people with visual impairment:

1. Choose font size and spacing, which makes it easier to identify letters and read (preferably Sans Serif).
2. Maintain high contrast.
3. Large, well-spaced objects, ensuring operation does not require fine gestures and accuracy.
4. Deliver information through colours, but adding icons to not rely solely on colour to mark actions.
5. Use pictures and icons similar to their real world counterparts, and add text tags to icons where possible.
6. Provide salient and clear information regarding invisible expandable components.

Forms, Registration & Sign-in

Changes may occur with age, affecting memory and the ability to plan, execute, and delay response (executive functions) (Anstey, 2004). Filling many details into forms and creating passwords (especially hard to remember ones) is tedious for all, even more so for older people. Therefore, when designing fillable forms, we recommend examining their necessity and whether to remove them. If unavoidable, they should be simplified as much as possible, making it easier for older people. We recommend writing a short explanation about the necessity of registration when required, and reducing the number of fields, designing them to be user-friendly, as demonstrated in Figure 2.

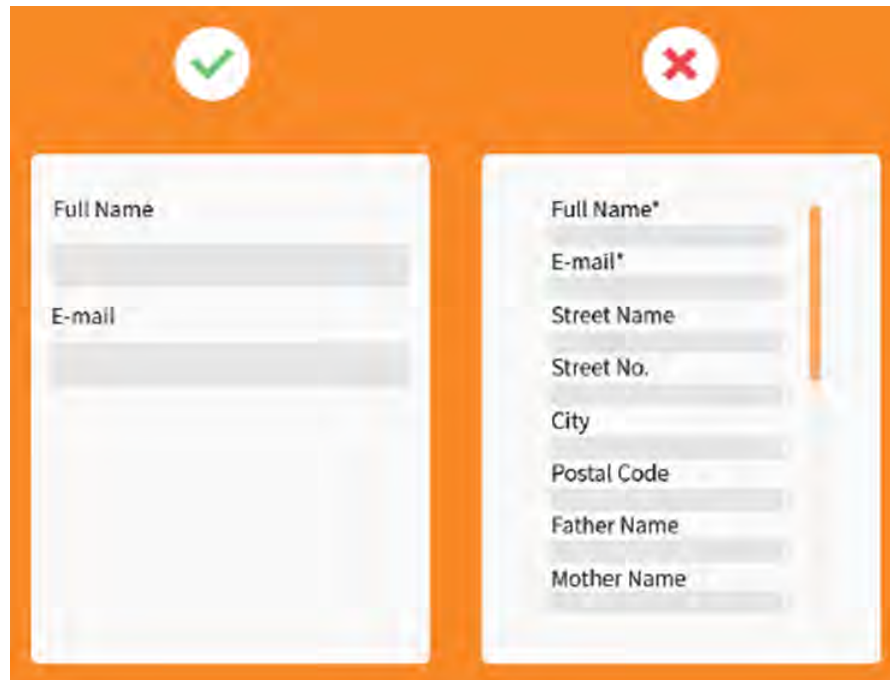


Figure 2. Example User Interface & Design Decisions Guidance: A better design for user registration

User Research

To enhance the adoption of digital platforms by older people, it is highly recommended to use UX research methods, including user testing and usability testing (Mannheim *et al.*, 2019), throughout the development process. Not only to examine existing digital platforms, but also in developing new ones. When planning user research, it should be noted that the older age group is highly diverse; spreading potentially over 40 years with greater in-group differences than any other. So, avoid ageism when recruiting, and prevent self-ageism as follows:

- Avoid mentioning participant age and referring to limitations/disabilities characteristic of their age group.
- Ensure clarity by providing clear and accurate instructions to reduce stress.
- Provide feedback to participants where possible, as to whether their comments were considered.
- Ensure fairness and ethical standards, with short and simple consent forms.
- Ensure accessibility, including with user devices and physical environments.

Conclusions

The challenge of equity in the Inclusive Design of digital technologies, includes unfriendly (exclusionary) design and functional irrelevance for older people, which can then become barriers to use. The design of interfaces typically does not address the requirements for a diverse range of users, failing to meet criteria for accessibility, usability and inclusivity. This can negatively affect older people, particularly those with physical or cognitive disabilities. Design processes often occur without the input of all end users, because of preconceived judgments regarding who will use specific digital technologies (UNECE, 2021). When digital technologies are specifically designed for older people with disabilities, it typically reflects the ageism of designers - their implicit stereotypes about 'the older technology user'. Instead, we need inclusive, age-friendly design in the development of mainstream digital technologies (Rothwell, 2017). This would ensure economies of scale, as well as widespread social acceptance of the enabling digital technologies, minimising the potential for stigmatisation.

The limitations of this work includes a lack of empirical confirmation that following the guidance will increase usability, and whether this would be through greater engagement and/or retention. Also, whether detailed instruction, rather than broader guidance, may be required for certain challenges, such as payment issues. Building upon our approach of involving multiple stakeholders in collaborative efforts, there should be greater collaboration between academia, industry, government, third sector, and older people. This should include case studies reflecting on the effectiveness of applying the guidance to digital platforms. This could include banking, online shopping, leisure, sports, and lifelong learning. Over the next two years, our goal is to implement the guidance in two different ways. First, working with major organisations to improve their digital platforms with the guidance, testing changes in use by older people. The first three are MOOVIT (most used public transportation app in Israel), Clalit (largest healthcare provider in Israel) and Ashdod municipality (as an exemplar of better serving older residents). Second, increase awareness among designers of digital platforms by incorporating the guidance into the syllabus of higher education institutions; and informing professional designers how to make use of guidance through conferences, webinars and publications. This aims to ensure that future designers are aware of age-inclusivity, and therefore included in the design of future digital platforms to improve usability in practice.

The coronavirus pandemic identified broad socio-economic challenges, and acutely how the lack of digital usage can increase isolation, affecting both mental and physical health. It showed worldwide that participation in digital platforms could mitigate feelings of social exclusion in times of physical distancing (Seifert, 2020). The pandemic highlights the importance of the usability of digital platforms for improving the lives of today's older people, and our future selves. We hope that the guidance, along with change in awareness, will lead to greater inclusion.

***Acknowledgements:** We would like to express our great appreciation to Didi Ben Shalom, Head of Digital Inclusion at JDC-Eshel, and Selly Bynessayn, Head of Digital Literacy at the National Digital Agency, for their valuable and constructive suggestions during the planning and development of this research.*

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