AI × Ageing Design

A report from the project

Inclusive design for the ageing population: exploiting the power of AI

Designing for the ageing population in the Artificial Intelligence Era

Insights from inclusive design practitioners

AI × Ageing Design

The work presented in the report is part of the project "Inclusive design for the ageing population: exploiting the power of AI". It targets design practitioners to understand how AI can be utilised to inform and assist design, with a focus on designing for ageing populations.

This project is funded by the International Association of Cultural and Creative Industry Research at Shanghai Jiao Tong University. Dr Weining Ning (Brunel University of London) and Dr Min Hua (Shanghai Jiao Tong University) co-lead the project.

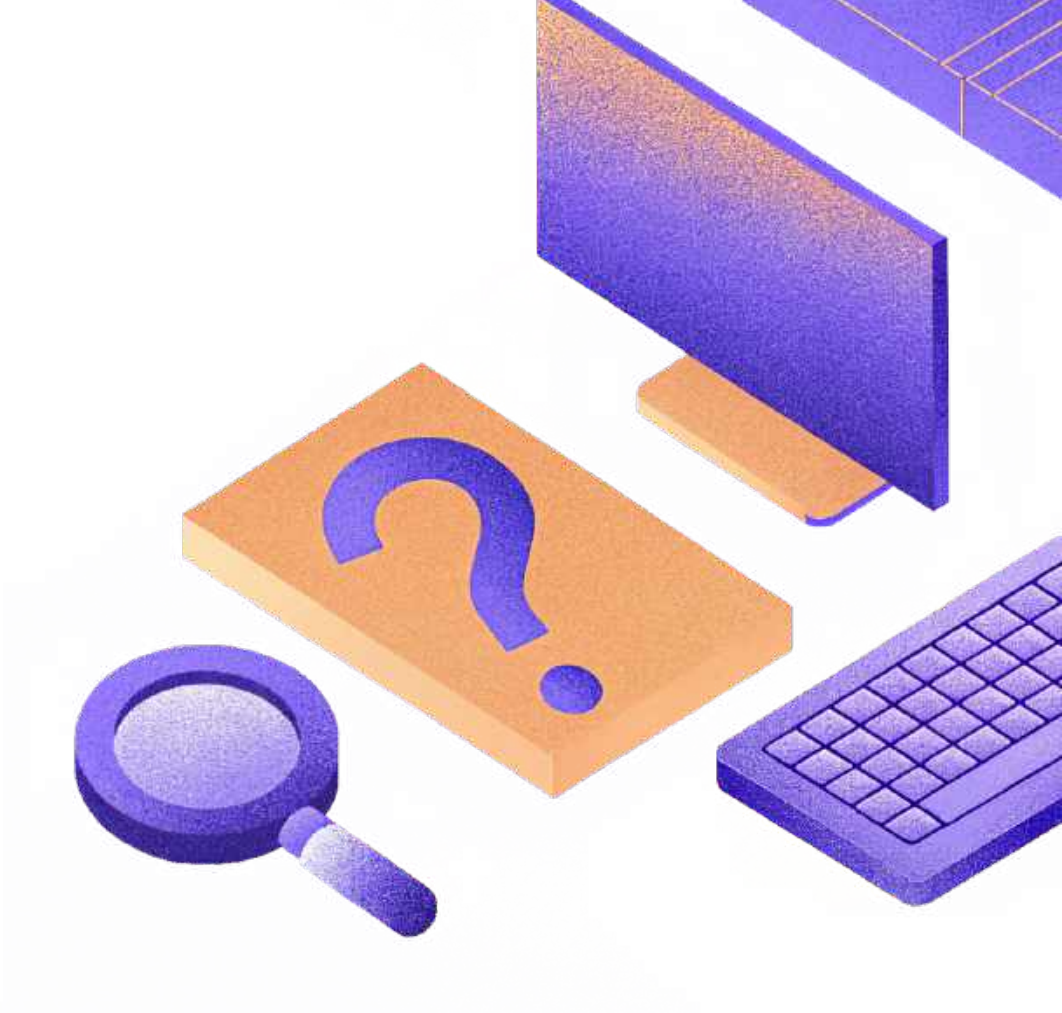
Executive summary

As global populations age, the need to design inclusively for older adults has never been more urgent. This report explores how inclusive design practitioners understand and engage with ageing populations—particularly in the context of the rapid emergence of Artificial Intelligence (AI). Drawing on qualitative interviews and roundtable discussions with experienced inclusive design practitioners across the UK, Europe, and China, the study captures rich insights into the principles, challenges, and evolving practices of Designing for Ageing (DfA).

The report begins by unpacking how ageing is understood within design. While ageing is often reduced to physical or cognitive decline, practitioners advocate for a broader perspective that includes social, psychological, and aspirational needs. They challenge ageist assumptions and emphasise the importance of viewing older adults not as a homogenous group, but as individuals with diverse capabilities and goals. This study also highlights the methodological complexities of engaging older adults in design, offering practical guidance on recruitment, relationship-building, and inclusive communication techniques.

With a particular focus on AI—which has emerged in recent years as both a powerful tool and a source of tension in the design process—this study investigates how practitioners are beginning to integrate AI into their DfA workflows. At the same time, it expands on the concerns about AI's potential to introduce bias, limit creativity, and reinforce ageism in society.

This report concludes by calling for a more holistic, relational, and forward thinking approach to inclusive design—one that views older adults not as constraints, but as co-creators of more equitable and innovative futures.



Introduction

Population ageing is a global challenge, calling for new ways of thinking about how we design for human diversity. Inclusive Design has emerged as a key design response—an approach that seeks to create products, services, and environments that address the needs of the widest possible range of people, regardless of age or ability. Designing for the ageing population is both a critical driver and a central application of Inclusive Design, advancing both social inclusion and market relevance in ageing societies.

Artificial Intelligence (AI) has disrupted many sectors in the past few years. With new AI application introduced every few days, design practitioners (researchers, designers, consultants, etc.) are also navigating this transformation—either actively or reactively— as AI becomes increasingly embedded in everyday design processes. While design has been one of the key use cases for AI, the potential benefits and risks of AI in supporting inclusive design for the ageing population remain unclear.

This report presents the outcomes of a research project that examines the intersection of AI and DfA from a design practitioner's perspective, providing insights on how inclusive design practitioners understand and engage with ageing populations—particularly in the context of the rapid emergence of AI.

While design has been one of the key use cases for AI*, the potential benefits and risks of AI in supporting inclusive design for the ageing population remain unclear.

Research approach

This report draws upon a qualitative research study that engaged experienced inclusive design practitioners through semi-structured interviews and roundtable discussions. Participants included designers, researchers, and consultants with extensive experience working with older adults in the UK, Europe, and China, comprising 20 in total—six joined a UK-based roundtable discussion, and fourteen were interviewed (four from China, two from Europe, and eight from the UK). The study prioritised experiential knowledge, exploring how practitioners conceptualise ageing, navigate practical design challenges, and respond to AI. The collected data underwent a thematic analysis to identify recurring patterns, tensions, and strategies across practices.

** Enterprise WordPress. (2023). AI Trends Report. Enterprise WordPress. https://go.wpvip.com/ai-report-2023*

01

Understanding older adults: A designers' perspective

Older adults are often portrayed through a narrow lens in public discourse, framed in rather simplistic terms—either as a numerical marker of years lived or through ageist assumptions that associate older people with decline, dependency, or disengagement.

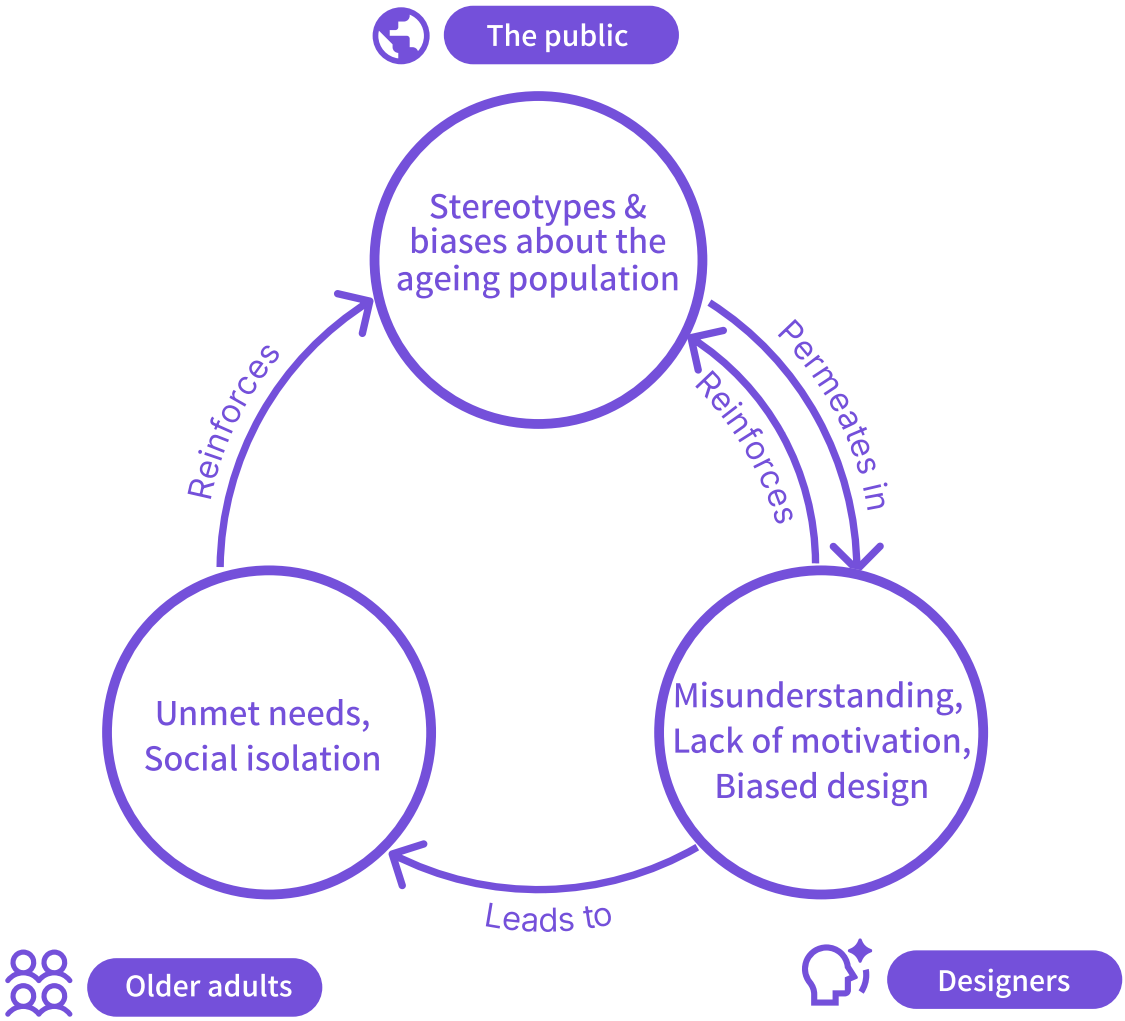
The very small bit but dominating facts of being old

Design practitioners' conception of older adults very naturally starts from those "common sense" assumptions that shape public discourse: people become physically vulnerable with age. This is often attributed to a decline in capabilities (e.g., vision, hearing, mobility, cognition), while such physical vulnerability has a ripple effect that extends to mental and social experiences. For example, older adults are deemed "more vulnerable to fraud" and often described as "worried about being deceived or scammed".

However, it should be noted that these images of vulnerability and frailty are closely tied to negative stereotypes and biases about older people. This not only leads to social isolation but also undesirably shapes current design practice. The stigma around ageing and disability can result in stakeholders' misunderstandings and low motivation to advocate for inclusive design.

Even within the limited number of designs targeting older adults, negative perceptions can permeate technological applications and reinforce ageing stereotypes. For example, older people are often provided with "dumbed-down" versions of technology, despite a strong demand for more powerful and sophisticated solutions among this demographic.

A vicious cycle then emerged, reflecting challenges from such dominating understanding of the ageing population.



A vicious cycle of designing for the ageing population practice

Understanding older adults: a design perspective

Designers and researchers help outline the key principles we advocate for and the common misconceptions we object to in understanding ageing. These reflect how we should understand older adults for more inclusive design.

What we advocate for

A comprehensive process

Ageing involves not only physiological and biological changes, but also what people interested in and what they'll accept.

Age is simply a number

People's experience with deign is defined by factors such as capabilities instead of age.

A group of great diversity

Ageing is shaped by unique genetic, lifestyle, environmental, psychosocial, and societal factors that resist homogenisation.

What we object to

Ageism

Older people are less capable and less motivated.

Over-simplification

Older people is a homogenous group with an overall declined capability.

The dichotomy of ageing

An overly optimistic (e.g., a life stage of 100% leisure) or overly pessimistic (e.g., being physically frail and weak) perception of ageing population.

Am I old?
How older persons see themselves

Drawing on the extensive experience of engaging older adults in the design process, design practitioners add another interesting layer to our understanding—one that takes the perspective of older people themselves.

Firstly, instead of being a “natural” transition of social identity, ageing can be seen as a self-identity that people may choose to adopt—or not. “People don’t necessarily see themselves as old” and consequently, they may not recognise that products targeting “older persons” are intended for them. Interestingly, in design activities that engage older adults, they may even align with the designers’ perspective and design for somebody else, rather than for themselves.

At the same time, older people are often aware of the negative stereotypes surrounding ageing and use their own strategies to combat ageism, seeking to preserve a self-identity of competence and confidence. They may not want to be treated as “old”. This is reflected in product use: they may refuse to use assistive devices or features associated with ageing. Products that carry stigma, those that might undermine a capable and independent self-image, are often avoided, even if they are technically more usable.

> They said “We are not idiots!”—so you don't have to treat them like children.[13]*

> They have insecurities that they might sound stupid, outdated, or wrong.[09]

** Superscript numbers in the text refer to individual participants interviewed for this study. All text enclosed in quotation marks is directly extracted from interview transcripts.*

A key concern: how older adults access and accept technology

Access to technology

Designing for older adults requires a deep understanding of their access to and interaction with technologies. While mobile devices and digital services are becoming increasingly integral to daily life, older adults often face barriers to adoption. These barriers are not necessarily rooted in disinterest, but rather in the ways technology is introduced and the channels through which they access it.

One key challenge is the language and vocabulary surrounding technology. When designing for the ageing population, it is usually not the case that older people themselves want simplified functions and products—though the current market often provides “dumbed-down” versions. Many older adults express a desire for the same advanced functions that younger users enjoy but lack the terminology to articulate their needs or to learn how to use them effectively. This gap in communication creates an access barrier, making it difficult for them to seek guidance or understand the potential benefits of new technologies.

Additionally, older adults may not always be aware of the full range of possibilities that digital tools offer, leading to an underutilisation of available technology.

> Older adults want the fancy functions as young people but lack the language to talk about and to learn about them; they haven't found the right access to it. We should empower them to open up and to learn.[07]

Family members often play a crucial role in facilitating technology access and adoption, either by introducing new devices or providing guidance. However, for certain groups of older adults, especially those perceived as incapable of using mobile phones or other digital tools, the access remains particularly restricted. This perception can create a self-reinforcing cycle in which older adults are not given the opportunity to engage with technology, further limiting their digital participation.

To improve access, an agreed direction of endeavour is to prioritise the experience of learning technology, ensuring that older adults have intuitive and empowering entry points into digital ecosystems. Rather than focusing solely on usability, it is essential to consider the pathways and contexts through which older adults encounter and adopt technology.

Technology acceptance

Even when access barriers are addressed, older adults' acceptance of technology remains a complex issue. They are often perceived as having low levels of technology acceptance. However, this should not be interpreted as a reason for exclusion. A closer look at the underlying causes reveals that older adults do have needs and motivations—it is often the design that fails to provide the right drivers and meaningful realisations.

I don't need it

Many design are crafted either based on designers' assumptions, dominating stereotypes, or those overly simplistic understandings of older consumers. This results in products that either address non-existent problems or fail to align with the lived experiences of older consumers.

Older adults exhibit low acceptance of technology not because they are inherently resistant to innovation, but because they do not see its relevance to their daily lives. For some, their existing routines function well without digital interventions, making the introduction of new technology feel unnecessary or even intrusive, resulting in disinterest rather than active resistance.

I don't understand it

A major factor influencing adoption is the lack of prior experience with digital tools. Without foundational exposure, engaging with new technologies can feel overwhelming. Cognitive fatigue further compounds the issue. With age-related capability decline, information processing becomes more demanding.

While technologies can be beneficial, the way design communicates and delivers them to older people often fails to align with their mental models and technological language. This disconnect can create unnecessary friction, making even well-intended solutions feel inaccessible or irrelevant.

I don't trust it

Another common challenge is skepticism toward new technology. Older adults may question the necessity of digital innovations, struggling to understand why a change is required, especially when existing systems function adequately for them. This resistance can stem from the mistrust of new technologies, concerns over losing control, or frustration with frequent updates and modifications that disrupt established routines.

Nuanced aspects beyond functionality—such as trust in technology and a sense of individual agency—are often not fully considered.

Interestingly, while resistance to change is common, older adults also demonstrate remarkable resilience and adaptability. Their life experiences contribute to flexible coping strategies, allowing them to manually adapt products to suit their needs. However, this adaptability comes with a trade-off: older adults may tolerate suboptimal designs rather than actively seeking improvements, simply “putting up with” inefficiencies that younger users might be more likely to challenge.

The unmet needs

Understanding the needs of the ageing population is a fundamental yet complex aspect of design. While ageing is often associated with physical and cognitive decline, design practitioners recognise that older adults have diverse and evolving needs, where design holds great potential.

Unsurprisingly, there's a big need of designing for health, wellness, and longevity. However, it is still a long way to go to get the design targeting these fundamental needs right. This calls for an in-depth understanding of the diversity within the ageing population (e.g., the need for care services can vary significantly according to older people's life stages) and the adoption of new approaches (e.g., proactive approaches that targeting early interventions when people still looks healthy instead of the current mainstream reactive ones).

In addition, social needs—manifesting in the desire for travel, social relationships, companionship, connection with nature, and more—have emerged as another strand of fundamental needs among older adults. At the Universal Design Conference 2024, this shift was reflected in discussions around a revised Maslow's Hierarchy of Needs, highlighting the growing recognition that social connectedness is the most fundamental needs of human.

Through the extensive experience of interacting with older adults, design practitioners have observed an overemphasis on the differences between the young and the old. The youth-obsessed mindset in design drives deep exploration into the detailed needs and desires of younger markets; whereas when designing for older adults, age-associated capability decline often becomes the primary focus, while nuanced emotional and social needs are overlooked or compressed. The key to addressing this challenge is rather straightforward: simply regard older people the same way we regard everyone else, and apply the same quality standards in the design of products and services.

Older people are often treated as a homogenous group; however actually the age scope can span very wide and there are huge differences among them, even just in their abilities.[04]

Our practise has primarily focused on older adults in good health condition to those who need end-of-life care. However, the stages between these two are largely overlooked.[12]

We are all people, having likes and dislikes, regardless of age.[01]

Call for a perspective shift

Designing for older adults requires a shift in perspective—rather than viewing ageing as a challenge to be overcome, it should be seen as an opportunity to create more inclusive and meaningful solutions.

02

Design for Ageing: experiences and insights from practise

Building on the designerly ways of understanding older adults, this chapter shifts the focus to the practitioners' firsthand experiences of designing for the ageing population.

It's all about good design

As indicated in Chapter 1, inclusive design practitioners advocate for addressing the full range of needs of older adults and oppose the young-old dichotomy. In design practice, the same standards of good design are urged to be applied when designing for ageing populations.

However, we have to acknowledge that there are practical barriers to implementing a “normal” process when designing for older adults. There is structural lack of knowledge about ageing population and the market. For designers, it can be more challenging for them to build empathy with older users (compared to the younger where they can at least learn from their personal experience). Extra efforts are needed to construct the proper level of understanding of ageing populations amongst not only designers, but also a wider range of stakeholders.

For instance, deciphering the diversity among older adults remains a challenge while one primary solution is qualitative studies which entails substantial resources (time, budget etc.). This, in turn, requires the awareness and support from a wider range of stakeholders, which is also substantially lacking.

They are just good design anyway... If you know who your audience is, you can design for them. In this sense, noting's changed because that's just good design.[05]

The approach is the same: realise the context and culture, iterate, and keep good communication.[12]

Every one knows the market is massive but there's very little provision. There's a missing piece of data which goes beyond anthropometric and marketing.[13]

Designing for the right part of the equation

Designing for the ageing population is not just about removing barriers or accommodating limitations—it's about rethinking priorities, amplifying strengths, and designing with intention. This section captures the voices of design practitioners who challenge the status quo, offering insights into what we should be doing to create truly inclusive, empowering, and forward-thinking solutions for older adults.

Designing with evidence, not assumptions

One of the most critical pitfalls in designing for older adults is the reliance on assumptions—whether about their preferences, behaviours, or limitations. Effective design requires stepping back, setting aside preconceived notions, and engaging in thorough research.

> You need to pretend you don't know anything and do research to understand the full.[01]

A common misconception is that older adults inherently prefer traditional aesthetics or overly simplistic designs, yet many appreciate modern styles and complexity when these align with their needs and experiences. Similarly, technology adoption is often misunderstood—not as reluctance but as a lack of access or an entry point that resonates with their experiences. A major design pitfall is treating older adults as a homogeneous group, leading to uninspired, patronising solutions that overlook aesthetics, personalisation, and engagement. Therefore, defining specific user groups within the ageing population is essential to addressing real needs rather than generalised assumptions.

While older adults are often assumed to be conservative spenders, spending habits vary widely depending on lifestyle and personal values. Design driven by assumptions can further lead to mistrust particularly when older adults feel they are being pushed toward unnecessary products or manipulated through technology. Elements such as online data sharing can be significant points of concern, triggering skepticism or even paranoia.

Designing with contexts

The insufficient understanding about ageing often lead to less effective, reactive approaches to designing for older adults. This can be reflected in design for behaviour change practices, where older people are frequently perceived as either less capable or less motivated. However, it is argued that the key lies not in motivation, but in the lack of triggers or contextual enablers that “make them feel empowered and want to do things”.

For instance, design or service solutions may need to consider practical factors such as mobility or distance—elements that are often overlooked, as designers may focus solely on core features or functions.

We think they are not using tech, this is because they just haven't found the right access to it.[07]

Older adults is a big group however we need to design for a more specific and concrete group. We need to disregard all the pre-assumptions before design.[04]

We should design for the right bits of that equation try to find the trigger and when that happens we can actually make the big impacts.[07]

The emerging urge for proactive approaches

Designing for ageing should not be a reactive effort—one that waits until limitations set in before offering solutions. By the time age-related challenges become severe, the window for meaningful intervention has often narrowed, leaving only limited options for support. Yet many existing design strategies still focus on accommodating impairments rather than preventing them, addressing problems only after they manifest. This approach overlooks a critical opportunity: designing for the years leading up to old age, shaping habits, environments, and technologies that can support healthier and more independent ageing.

> We are not designing for a population that's already reached out that age, but designing the intervention and the way to keep active.[07]

Practitioners emphasise the need to shift from the reactive to a more proactive design mindset. Rather than simply adapting mainstream products for older adults, design should engage with the stages leading up to ageing, recognising that the conditions set earlier in life can either add or remove years of independence and wellbeing. This means rethinking how we approach cognitive engagement, mobility support, and social connectivity—not just as interventions for those already facing difficulties, but as foundational elements embedded much earlier in life.

This shift is not just about products but about rethinking the role of design in shaping ageing itself. The question is no longer just “how do we accommodate ageing-related impairments? ”but rather “how do we design for longevity, resilience, and sustained wellbeing?” By addressing the root causes of age-related decline and embedding support much earlier, design can play a transformative role in shaping not just how we age, but how well we live.

Engaging older adults in design and research

Engaging older adults in design and research activities is both a practical challenge and a critical opportunity to enhance the inclusivity of design outcomes. While involving older adults is widely acknowledged as a gold standard in DfA, achieving meaningful participation in practice requires thoughtful strategies and adaptable approaches.

Approaching older adults

Establishing initial contact with older adults can be achieved through a variety of methods. In-person visits, particularly those that take place in familiar environments, provide valuable opportunities to observe real-life contexts and foster open communication.

Engaging with existing online communities or leveraging the “herd effect” by collaborating with community opinion leaders can also be effective strategies for reaching larger groups. Before diving into research activities, building relationships through informal interactions, such as short visits or casual chats, can help ease potential participants into the process. Offering fun activities as an introduction can lower barriers to participation and make engagement feel less formal or intimidating.

The sampling strategy

Designing an effective sampling strategy involves more than simply selecting participants based on age. Practitioners recommend basing inclusion criteria on evidence-informed factors, ensuring the study sample represents a diverse range of experiences and perspectives.

Sampling should aim to include a core group of typical users, complemented by extreme users (also called critical users) who may challenge assumptions and provide unexpected insights. Extreme users—those who might not typically engage with a product or who live very different lifestyles—can accelerate the design process by highlighting unique needs or barriers.

To filter suitable participants, informal conversations during introductory activities can be helpful. Many practitioners adopt an iterative approach, starting with a broader group and gradually refining the participant pool to focus on those who provide the most valuable insights.

Addressing bias and ensuring diversity

A critical challenge in sampling is avoiding bias. There is a tendency in current practice to engage only those who are enthusiastic about participating, which can lead to overly positive feedback and miss critical voices. To address such biases and ensure diversity, it is important to keep a diverse profile of participants by expanding the focus on critical users. for instance, designers can consider:

- *Mixing up the people who are the target and who are not the target*
- *Keeping a mix of personalities—from highly talkative individuals to those who are more reserved*
- *Including expert users and critical/ extreme users.*

Critical/Extreme users

Incorporating critical users—those who may challenge the design concept or present unique use cases—can significantly enhance the development process. Although these users can be difficult to engage, identifying them early using techniques like the “traffic light” approach can streamline recruitment. Engaging a small but well-chosen group of critical users can yield deep insights without the need for large-scale studies, offering a more focused and efficient approach to inclusive design research.

Critical users are helpful, but it's difficult to approach and include them. Some successful practice received support from a "enlightened" client or third-party institution. This give rise to the idea of a possible pool/bank of users which can address the challenges met by designers. While it is advocated by practitioners, there's also the concern that those well-trained expert users might lead to biased results. To achieve inclusion and address the diversity, it is important to "keep fresh". Expert users, however, are knowledgable of design activities and the “tricks” of engagement and thereof may "tell you what they think you want to hear".

A talent bank of older adults

Though practitioners primarily rely on themselves to engage users, collaboration with care homes, community groups, charities, and other organisations reveals a promising approach: the development of a “talent bank”—a structured network of older participants who can be called upon for studies. By establishing long-lasting relationships with community champions, industry partners, and advisory boards such as lived experience groups, researchers can access a diverse pool of participants while ensuring that engagement remains meaningful. This model not only streamlines participant recruitment but also fosters sustained involvement, creating a more engaged and empowered user community.

A practical strategy of engaging with older adults

Design practitioners interpret and engage with older adults in various ways, shaping the approaches they take in developing products and services. Three key perspectives emerge in understanding older adults within the design process: as extreme users who push the boundaries of inclusivity, as normal people whose needs extend beyond physical capabilities, and as positive and valuable resources with rich life experiences to contribute.

Older adults as extreme users

Engaging older adults as extreme users in design practice can effectively help designers achieve inclusivity. This perspective reflects the "include one, extend to more" approach of inclusive design; it benefits not only older individuals but a much broader user base.

Older adults as normal users

Design should focus more beyond capability decline, but also the nuanced mental, psychological, social, and spiritual needs of older adults.

Older adults as valuable resources

With valuable insights and life experience, older adults are social resources of great potential. They can serve as consultants, co-creators, and advisors for a wide range of design projects.

Principles of engagement

Effectively engaging older adults in design requires more than just their presence—it demands thoughtful planning, sensitivity to their needs, and an approach that fosters trust and comfort. Design practitioners have identified a number of principles that can help facilitate meaningful participation.

Be mindful and prepared

Engagement should be well-structured, carefully planned, and considerate of participants' needs. This includes choosing the right communication channels, being aware of cognitive fatigue, and allowing adequate time for meaningful participation. In the course of engagement, the engagement activities should have a clear structure that helps older adults stay engaged without feeling overwhelmed.

Create a comfortable atmosphere

Engagement begins with making participants feel at ease. Simple strategies like icebreaker activities, humour, or even music can help reduce tension, especially when discussing sensitive topics. Additionally, conducting engagement activities in participants' own spaces helps them feel more in control.

> Be prepared in a way that's respectful and makes participants feel heard, rather than just ticking the boxes.[07]

> In their space, they are the experts of their lived experiences, so they feel comfortable.[13]

Build trust

Trust is a fundamental factor in engagement. Older adults may be skeptical about why they are being engaged and how their input will be used. Mistrust can also extend to technology and prototypes, as some older adults fear being misled or unsafe when interacting with unfamiliar tools. Ensuring that participants understand the purpose of the engagement and see value in the research helps sustain their participation.

Use the right language

Language can be a barrier if not handled carefully. Designers noted that many older adults struggle with technical jargon and may lack the vocabulary to articulate their needs. Simplifying language is helpful, but it should not be overly reductive or patronising as older participants may feel offended by being treated less knowledgable and capable. Therefore, striking a balance between clarity and respect is crucial.

Be concrete and specific

Older adults respond better to tangible and visual materials rather than abstract discussions. While implementing the engagement activities, it is useful to provide physical objects, printed images, or prototypes helps elicit more meaningful feedback.

Immerse into the context

Engaging older adults effectively demands deep, immersive research. Many practitioners emphasise that spending time with participants in their real-life environments is essential to uncovering genuine insights that may be overlooked in conventional research methods. For example, many older adults develop their own adaptive strategies for daily tasks, which may not surface in verbal interviews.

> Show them things and get them to interact rather than expecting them to describe something abstract.[14]

> The number one is time; spending the right time is the key to finding the right dips.[07]

By observing them in their environments, designers can identify “hacks and tricks” that reveal gaps in existing design solutions. A longer engagement period also allows researchers to develop stronger relationships with participants, leading to more honest and meaningful input.

Practical techniques of engagement

In addition to the principles that guide the design and implementation of engagement activities, designers also shared practical techniques that encourage active participation while respecting older adults' preferences and limitations.

Inclusive channels of communication

Designers and researchers should choose the appropriate channels and formats for communication. Communication methods should be multimodal, considering visual, written, and verbal formats to accommodate different preferences. Some older adults struggle with certain digital tools, so having multiple options is important.

Traditional design tools, such as probes and surveys, may need to be adjusted to suit older adults' preferences by providing such inclusive channels of communication. Tools should be interactive and flexible to encourage deeper engagement.

The challenge is to get classic tools at the right level, making them inclusive.[13]

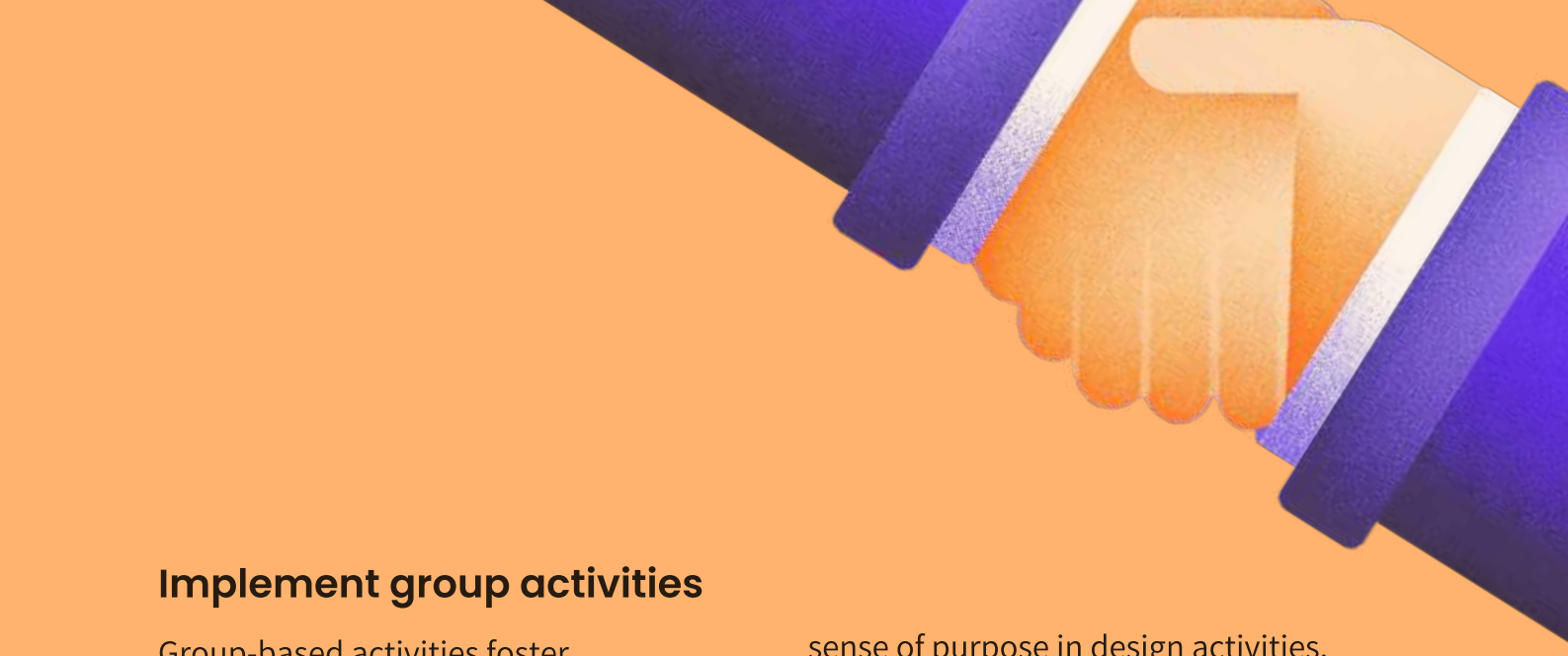
Use visual aids for communication

Visual materials are effective in initiating conversation, clarifying concepts, and eliciting opinions. Many older adults find it easier to respond to visual prompts rather than formulate ideas from scratch. Visual aids can also help bridge language gaps and reduce cognitive overload, particularly when dealing with complex or unfamiliar topics. Additionally, some older adults struggle with hypothetical discussions, so showing physical prototypes, sketches, or real-world examples helps ground conversations in concrete reality.

Visuals act as a trigger for expression, helping to start discussions and make engagement more dynamic.[03]

Images act as a primary means of communication in focus groups.[05]

However, it should be noted that the style of visual representation matters—abstract visuals may be confusing, so it is essential to align them with participants' mental models.



Implement group activities

Group-based activities foster interpersonal interaction, helping older adults feel less pressured and more comfortable expressing themselves. Pairing older adults with designers or other participants can also enhance participation.

Focus groups work well because of their sociable aspects—it creates energy.[14]

Provide individual support

Some older adults may need one-on-one assistance during engagement activities. Assigning assistants or pairing participants with designers can help bridge confidence gaps, create more friendly atmosphere, and contribute to meaningful engagement.

Use task-based engagement

Structuring engagement through tasks and guided activities helps maintain focus and avoids overwhelming participants. Task-based engagement helps maintain focus, reduces cognitive overload, encourages participation, and provide a sense of purpose in design activities. Practitioners emphasise that designing engagement as a series of small, manageable tasks allows older adults to contribute meaningfully while feeling comfortable and in control.

Creative tasks can serve as warm-ups or icebreakers, reducing pressure and making engagement feel natural.[04]

For instance, Designers found that older adults respond well to:

- Clear, structured tasks (e.g., fill-in-the-blank, ranking activities),
- Choice-based questions rather than open-ended ones, and
- Creative tasks as warm-ups or icebreakers.

While structure is important, engagement should not feel overly rigid. Some may need more time or additional guidance, while others may prefer a freer, more exploratory approach. We need to “allow room for natural discussions and unexpected insights to emerge”.

Conducting effective research for DfA

Engaging older adults is a cornerstone of designing for DfA, but it is ultimately part of a broader commitment to conducting effective research. This section highlights practitioners' experiences and reflections on what makes research effective when working with ageing populations—offering practical guidance on recruitment, relationship-building, and navigating real-world complexities.

Advocate for a mixed approach

A single research method is rarely sufficient in capturing the complexity of ageing experiences. Design practitioners emphasise the importance of combining quantitative and qualitative research to balance broad trends with deep, people-centred insights.

Quantitative research

—such as population data, surveys, and demographic analysis helps identify macro-level trends, highlighting who is being excluded and where gaps exist.

Qualitative research

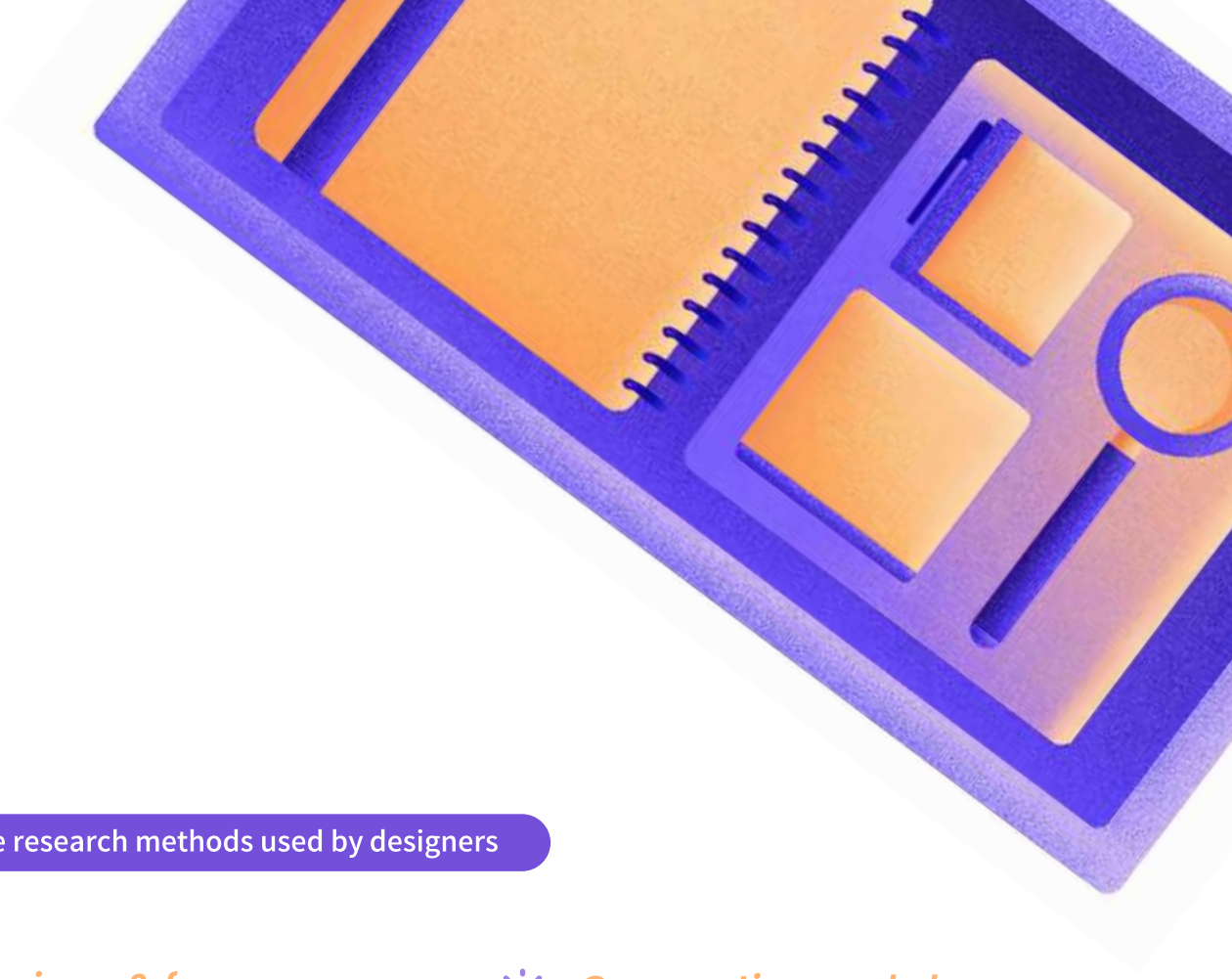
—such as interviews, ethnography, and co-creation workshops, provides in-depth insights, helping to explain the causes behind the trends.

Designers from industry provide an "ideal recipe" of mixed approach to include quantitative and qualitative research:

> [it should start with] an open-ended interview which leads to views and opinions; then design and implement a questionnaire survey based on the insights, resulting in trends; lastly a more focal interview to clarify the cause/reason of such trends.[11]

The strength of a mixed approach is that it will not only scientifically improve the validity of the research, but also also supports designers in advocating for and evidencing their work to different stakeholders. This layered approach ensures the inclusion of both broad observations and focused, actionable insights, integrating both data-driven and experience-based evidence.

> The shortcoming of qualitative is that it is difficult to convince industry to get involved; you need big data to demonstrate that this repeatability in what you have found.[13]



Qualitative research methods used by designers

Interviews & focus groups

Relatively easy to conduct but require careful question design and facilitation

Co-creation workshops

Engaging participants as active collaborators rather than passive subjects

Ethnographic field studies

Spending extended time in participants' spaces allows for immersive, real-world insights

Observation

Observing older adults in real-life environments, especially for old-old participants who may find interviews challenging

Cultural probes

Self-documentation tools that encourage older adults to share experiences in their own time

Diary studies

Capturing long-term insights by allowing participants to document their thoughts over time

As for quantitative research, questionnaire survey turns out to be the mostly used one. It also worth noted that designers usually spend more time on the qualitative part of a project while the quantitive can be integrated through collaborating with other disciplines (e.g., social science) or utilising available datasets.

Address practical constraints

Research with older adults often faces time, budget, and recruitment challenges. In practice, designers may also need to flexibly arrange and adapt their research to facilitate data collection. This means they often have to make practical compromises, including:

- Shorter engagements: When extended ethnographic research isn't feasible, "one hour interviews can still yield valuable insights".
- lightweight usability testing: Instead of large-scale recruitment, practitioners sometimes conduct quick tests with readily-available participants.
- Running focus groups rather than individual sessions helps reduce costs while still capturing diverse perspectives.

It's always about budget and time—we might do an hour-long interview instead of spending a week with someone, and that can still be super helpful.[07]

Due to budget and time constraints, we use focus groups instead of deeper one on-one engagement, though it's not ideal.[05]

Design research materials thoughtfully

The design of research materials can also influence participation and engagement. Some materials, such as "thick printed reports" or "dense surveys", may feel intimidating to older adults. Therefore, some practitioners stress the importance of customising research tools to target specific user groups. For instance, in a longitudinal diary study, the research team developed a diary toolkit and posted necessary materials to the participants weekly. This approach proved effective in enhancing engagement and facilitating consistent data collection.

The majority of our projects involve designing research materials that allow people to engage with us...[13]

Choose the right tools and mediums

Selecting appropriate tools and mediums is crucial for effectively engaging older adults in research. While technology and structured materials can aid participation, they can also introduce barriers, biases, and unnecessary complexity.

Keeping it simple

A common approach is to prioritise low-tech, intuitive tools (paper-based diary book, printed images etc.) that older adults can easily engage with. However, oversimplification can also be counterproductive as elder adults want to be treated as normal, and they may prefer more depth and structure.

Technology as a potential barrier

While digital tools can enhance accessibility and efficiency of research, they often present challenges in research with older adults. Practitioners highlight several common issues:

- Platform overload: Using multiple digital platforms can create confusion and disrupt engagement.
- Limited creativity and interaction: Online meeting tools may impede natural discussions and idea exchange.
- Accessibility bias: Digital-based research risks excluding those who lack technological access or familiarity.

03

Inclusive Design in practice

Inclusive design has been acknowledged globally as a guiding principle for creating products, services, and environments that accommodate diverse user needs. However, in practice it remains a broad and sometimes ambiguous concept, interpreted and applied in varying ways. This chapter explores the current landscape of inclusive design practice by summarising practical inclusive design approaches that have emerged from real-world applications. It also highlights the persistent challenges designers face, shedding light on the ongoing evolution of inclusive design in practice, especially in a time when AI brings opportunities and uncertainties.

Practical approaches of Inclusive Design

Inclusive design is widely acknowledged as an essential approach to creating products and services that cater to diverse user needs. However, in practice, it is often interpreted and applied in different ways, shaped by organisational priorities, resource constraints, and evolving understandings of inclusion.

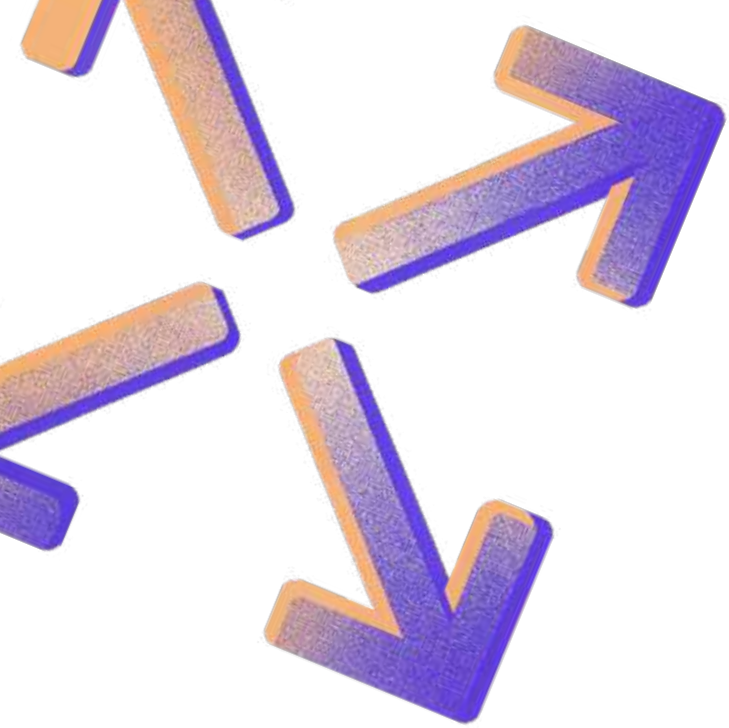
> We mean more about accessible design when talk about inclusion; it focuses on disabled people.[10]

The Discrete Approach: accessibility as adds-on

Accessibility, in practise, is the most “salient and visible” area where practitioners understand and implement inclusive design, though it is acknowledged that being accessible is only a small portion of inclusivity.

Accessibility (deemed equals to Inclusive Design in this approach) is sometimes treated as an afterthought or an add-on, such as additional booklets or external usability standard accommodations. This approach is therefore often separated from the design and development process. It is common to focusing on achieving compliance with established standards (e.g., contrast, text size, voice-over).

Such accessibility audit is usually carried out in a post-hoc fashion, and it is often the “accessibility specialists” instead of designers that lead the evaluation.The lack of integration with design process and user engagement indicate that this approach can lead to discrete solutions that does not appeal to either the assumed target user or the so called “disabled users” they intended. This also reinforces divisions between “normal” users and those so called “marginalised groups”. Despite its limitations, the Discrete Approach that centres accessibility in achieving inclusive design remains a practical pathway towards inclusion in real world design practices.



Helping the elderly is also helping the others - [it is] anchoring something that's good for humanity.[07]

The Humanity approach: Inclusive Design as a universal good

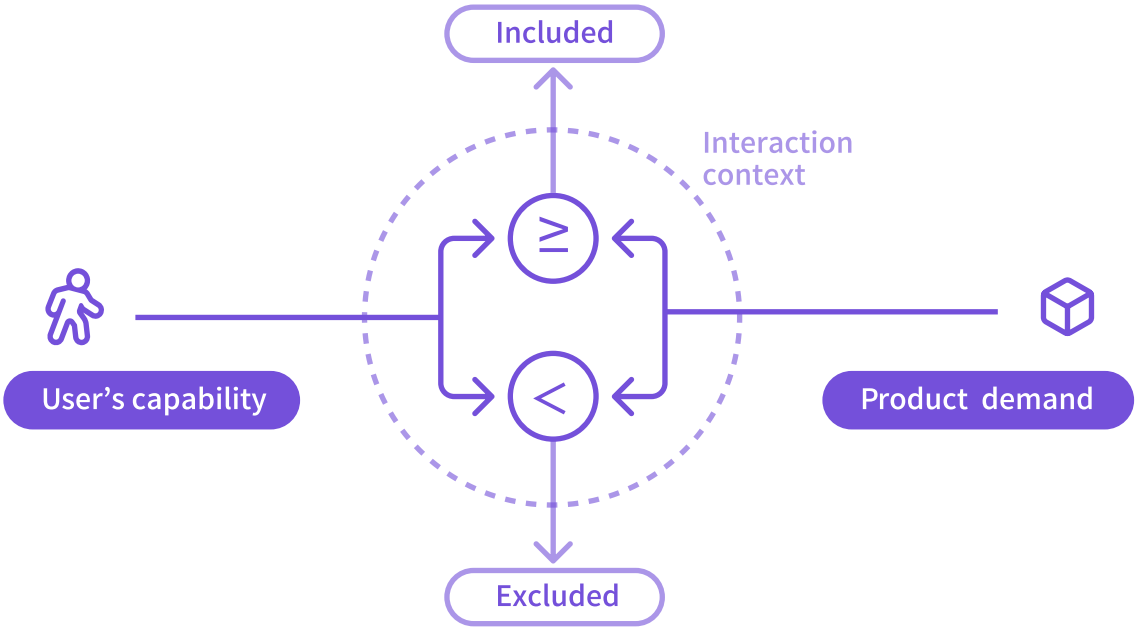
The Humanity Approach approach views inclusive design as an investment in humanity rather than targeting specific user groups. It can be achieved in two formats:

1. When designing for older adults, designers should consider how the design could benefit younger users. This aligns with the classic idea of “include one, extend to more” of Inclusive Design.
2. If designing in a proper way, the products we design for youth can continue to benefit their future selves. Products designed with inclusivity in mind should support users across the life course, reflecting the proactive approach of achieving inclusion. The Humanity Approach resonates with the nature of Inclusive Design that Inclusive Design is Good Design. However, in practice, this approach requires significant resources such as “long time immersive research with users” which are often challenging to practitioners. In our study, only a very limited number of experimental cases were reported and almost none of them strived when financial supports ceased.

The Capability Approach

A strand of practice follows the well-established Capability Approach to Inclusive Design, where inclusivity is conceptualised and achieved by mitigating the mismatch between people's capabilities (e.g., vision, hearing, mobility) and the demands imposed by interacting with a product. The Capability–Demand model and the associated evaluation tools developed by the Engineering Design Centre at the University of Cambridge represent one of the most established Capability Approaches, offering a more measurable and quantifiable pathway to inclusive design.

The existing Capability Approach, however, primarily focus on the traditionally measurable ergonomic aspects and requires up-to-date population-scale data. In design practise, the applicability of Capability Approach can be limited in today's digitalised design. Designer are eager to expand the definition of capability as "the competence to do something" to including "the willingness and motivation to do something". In addition, they also expect a more holistic Capability Approach that focuses on how users' different capabilities "synthesise" and interact with the external environment, instead of simply adding up the evaluation score of individual capabilities.



The capability-demand model of inclusive design*

** Persad, U. (2012). Exploring a capability-demand interaction model for inclusive design evaluation [Thesis, University of Cambridge].*

The Adaptation Approach

“We should create products that are inclusive in the first place”; however “it is not feasible for a company to start from scratch”. With Inclusive Design being introduced and accepted by increasingly more practitioners, the Adaptation Approach emerged effective by modifying some of the existing product features so as to meet the needs of previously excluded user groups (typically older adults). This approach is widely adopted by digital products where modifications of design are relatively easy to implement.

It works, but it's gross, looks awful.[06]

While the Adaptation approach turns out effective for companies to meeting the accessibility/inclusion standards, it risks reinforcing stereotypes about the user groups that is aims to adapt to. For example, the “inclusive” version of many digital products simply increase sensory accessibility and reduce functionalities to accommodate the older adults’ needs. It implies that “no research has been done together with older adults, and it is what we think they need”. Consequently, those post-hoc modifications often results in products that are older adults refuse to adopt and use. It may also reinforce people’s stereotypes and bias about older adults.

The Pragmatic Approach: inclusion as an ongoing process

Practitioners recognise that inclusive design is an iterative, pragmatic process rather than a one-time solution. Instead of trying to create truly inclusive design at once, the Pragmatic Approach emphasises setting realistic goals, making incremental improvements, and balancing inclusivity with feasibility. Designers must navigate trade-offs, acknowledging that it is impossible to meet every requirement for every user.

Sometimes we are too ambitious and lead to viability issues...just including more and then see what else do we need to do to make it relevant.[07]

The challenges of Inclusive Design

As discussed in previous sections, designers admit that designing for older adults is not necessarily more difficult than for the so-called “mainstream”, as long as the standards of good design are well practised. However, the other side of design practice also indicates that various compromise have to be made by designers; at the practical level there are still challenges to address.

Build the shared understanding

When the concept “inclusive design” was crafted, it had the emphasis on the commercial feasibility of design and advocated a holistic view to user groups (instead of separating the “mainstream” and “marginalised”). However, the misunderstanding of inclusive design prevails not only among the general public but also design professionals.

...[there are] so many similar terms, people are confused.[09]

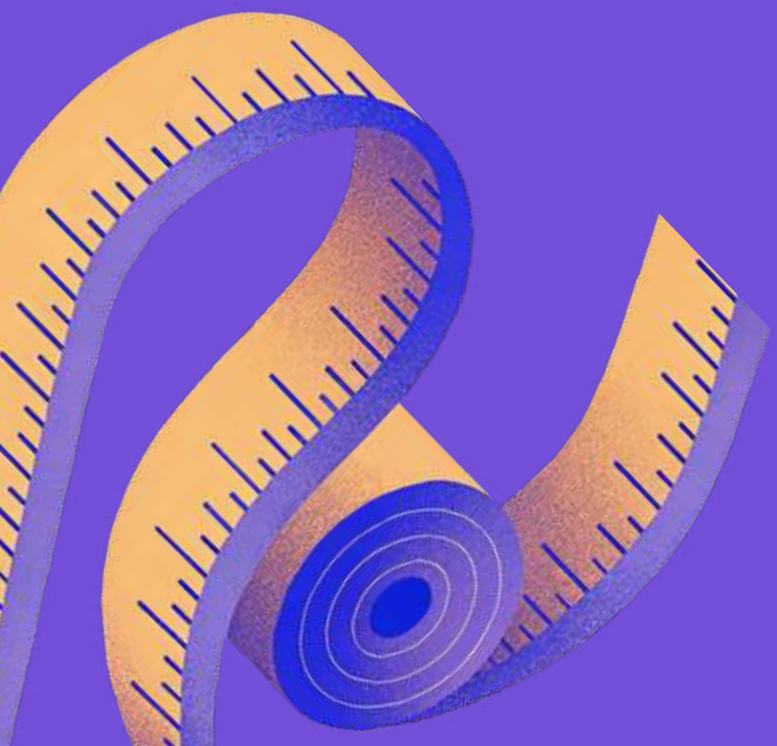
People get the word [inclusive design], but what does it actually mean?[13]

In recent years, “Inclusion” is being broadly embraced as a social value, implying that the appeal to be inclusive can permeate into every aspects of life. There’s the concern that the practical aspects of “inclusive design”, which aim for creating user-friendly and commercially-viable products services, are diluted in the public discourse. There’s even the danger of tokenism where “people talk about inclusive design, but they don't really define it or go into any detail”. We have also observed confusion and concern among design professionals.

Levelling down to design practise, the causes of exclusion are deemed overwhelming, spanning from age, gender, race to individual capabilities and preferences. Consequently, many current practices resort to a more pragmatical approach and only focus on the accessibility of design instead of fuller experience. Sometimes such so called inclusive features embody as add-ons to existing products however is not appreciated by any groups of users.

Establish empathy

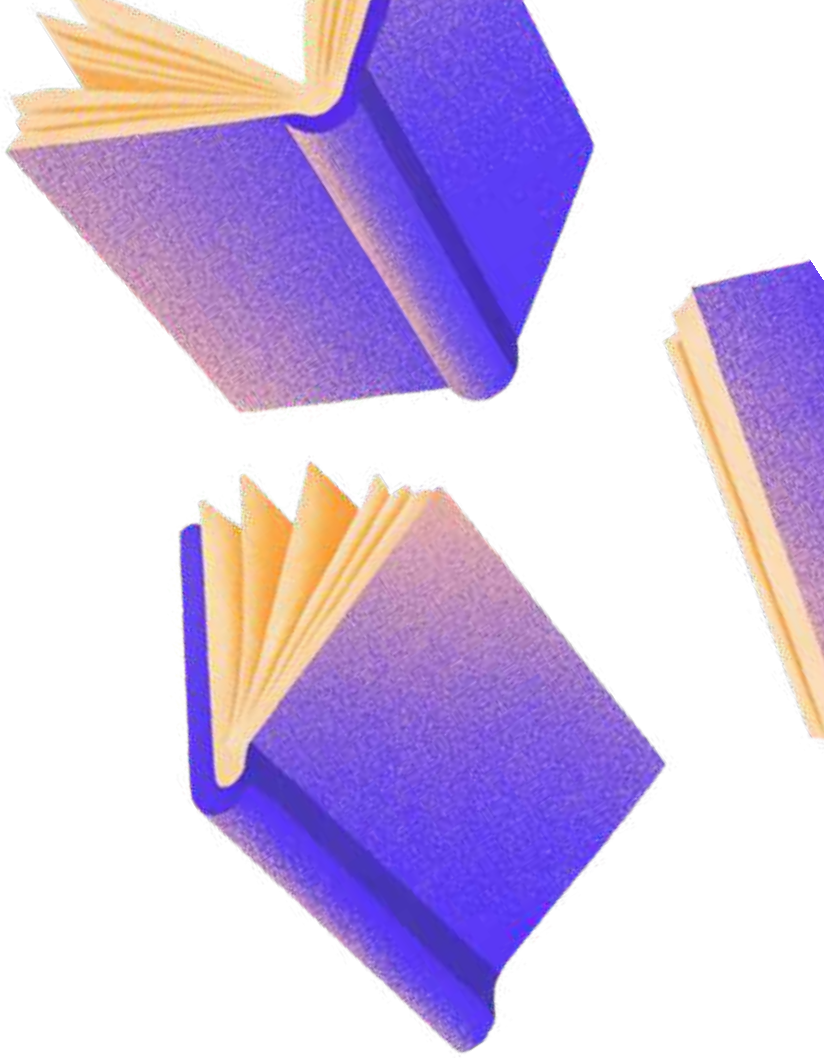
How to build empathy with older adults and understand their real needs surfaced as a primary barrier towards age-inclusive design. The current design workforce is young and their attitudes towards and experience with technologies, as well as lifestyles can differ significantly from older generations. It is therefore challenging to establish un biased understanding of the “average” older adults, not even to mention the great diversity exits in this population, based on simply light-touch with older adults through quick desktop research or conversations. From our research, the only gold standard of building such empathy is through immersive research and and spending (long) time with older adults, while time and budget are always the biggest challenge for such immersion into individuals and their contexts.



Evaluate age-inclusivity

Another challenge particularly exists at the evaluation stage and it manifests in two folds. First, it is difficult for designers to involve real users, especially older adults, in the evaluation stage due to resource limitation. In addition, there can be practical barriers to include older persons in design evaluation. For example, extra communication is often needed to help participants build a proper understanding and establish trust upon a low-fidelity prototype in evaluation.

Second, numerous design supports available (primarily materialised as principles and guidelines) at the design and development stages; nevertheless, there’s no guarantee for solutions to be more age-friendly. There’s currently the lack of evaluation methods/tools specifically consider age as a design parameter. In particular, quantifiable evaluations—those simply telling “how inclusive it is”, are preferred. Such quantitative results will not only help designers' decision making, but also serve as solid evidence when convincing various stakeholders.



The lack of experiencial knowledge

It is widely agreed that designing for the ageing population requires experiencial knowledge that can be tacit in nature. Though there are plenties of design supports to offer, it still relies heavily on individual designers' experience to make decisions and negotiate amongst the intertwined complexities and constraints in the real world. Designers who have limited experience of designing for older adults may therefore struggle to set priorities amongst complex design parameters.

For example, the improper balance between the mainstream's and older adults' needs may lead to a design that is not accepted by neither of them (the Discrete Approach of Inclusive Design). The challenge, then, is how to help design professionals build and share such experiences more effectively. This aligns with the expectations of one participant from a world-leading ageing design research institute, who emphasised the importance of sharing these experiences:

> If someone's working in the domain of design and ageing for 30,40,50 years ...their instincts are correct. Their experience is accumulated. They can make good decisions, they they can retain a lot of insight around staging body or whatever; for a early stage designer or junior designer, they don't have that.[12]

Combat ageism and stigma

Ageism remains a significant challenge towards an age-friendly society. Reflected in design practise, ageism can manifest across different layers and exert systemic impact on the advocate of inclusive design. At its core lies the stigma associated with ageing itself, as perceived by older individuals who may internalise societal attitudes. This is further compounded by stigma embedded within products, where design choices, such as colour, material, or form, can inadvertently signal frailty or decline. Some examples provided by participants from this study are:

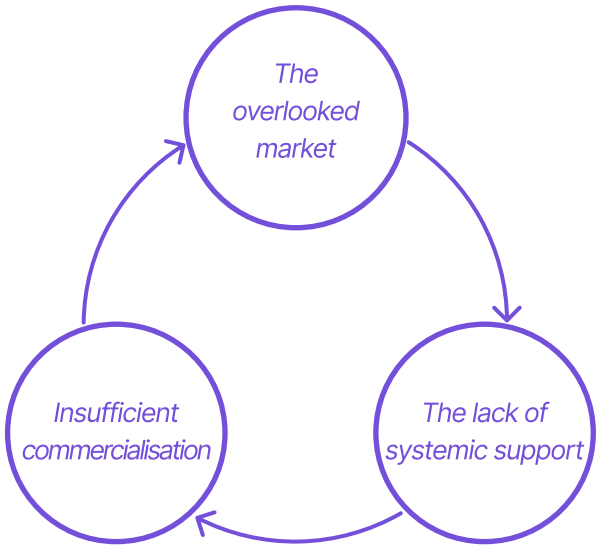
- A plain alloy walking stick is often associated with physical weakness.
- Individuals might avoid using features labelled as “accessible” or “age-friendly” due to the fear of being stigmatised.
- Hearing aid users may resist products with overly noticeable designs.

The influence of stigma extends to stakeholders such as retailers, who may view ageing or disability-focused products as less desirable or even harmful to their brand image. Businesses, too, may shy away from engaging with the ageing market due to concerns about how it might affect their public perception.

Moreover, stigma also arises from the social values and norms associated with “being old”. Older adults often worry that their desires and aspirations, which may extend beyond societal expectations, are less likely to be appreciated. For example, one participant in their research found that many older adults were eager to become internet celebrities on platforms such as Douyin and TikTok. However, they were reluctant to express these aspirations openly, as it challenges the prevailing social norms for older adults. This also hinders the public’s awareness and understanding of various possibilities of ageing.

Inclusive design for the ageing population: the vicious cycle

While practical barriers persist, the primary challenge of age-friendly design is more daunting. Both design professionals and the general public lack sufficient understanding and appreciation of designing for the ageing population, resulting in a less-enabling environment where inclusive design struggles to make a significant impact. This has created a vicious cycle in which a large market segment remains misunderstood and overlooked.



The overlooked market

The demographic shift of an ageing population gives rise to a growing market where huge amount of opportunities exist and under-explored. However, this market of great potential is overlooked. The design profession has expressed the concern that the current market is (and is becoming more and more) youth-obsessed; business may regard the market for ageing population is not big enough yet.

The lack of systemic support for design profession

Due to the short-sightedness and neglect of the market, the business sector naturally lacks the fundamental motivation to engage. This lack of drive subsequently propagates to other areas, including design, technology, and related stakeholders and processes, resulting in a systemic absence of support for ageing design initiatives.

I think a lot of design companies are used to doing minimal research. They might tell a story about one person they met, and that's appealing because people like human stories...But there needs to be more—more engagement, more stories, more understanding that aging groups are not homogeneous... It has to be much richer, more genuine, and not tokenistic.[13]

The challenges with inclusive design usually stem from the lack of process; like the lack of research in the process specifically.[07]

The lack of appreciation

Thorough user research is crucial for understanding the diverse needs of different user groups. However, with money and time as the primary constraints, business may not prioritise or invest in adequate research, which can lead to ageing design practise that either target the wrong problem or over-simplify the understanding of older adults. Moreover, barriers also emerge from everyday workflow. For instance, designers may not be able to access necessary user feedback data which can be valuable for improving inclusion.

Beyond individual businesses, the design profession can experience the lack of appreciation from clients, consumers, and the wider public. Companies are keen to talk about inclusion but hesitate when put it into action due to resource required. Successful design initiatives often rely heavily on "enlightened clients" and even buyers can be "less on-board with the idea".

The lack of standardisation & policy

In addition, it also appeals for more support from the governors and policy makers. There is the consensus that policy and legislation can be strong drive for promoting inclusive design for the ageing population. Collective efforts from industry sectors (e.g., establishing industry standards) are also valuable to develop a cohesive inclusive design ecosystem and exert bigger impacts.

It is also important to embed inclusive design thinking in the policy making process to ensure that resulting policies will not reinforce the stereotypes of ageing and sparkle more positive initiatives.

Insufficient commercialisation & low market visibility

The misconception of the market potential and absence of structural support for design profession lead to insufficient commercialisation and low visibility of inclusive design in the market. As discussed above, businesses can be less-motivated to prioritise and invest inclusive design, which is deemed as a primary cause of limited presence of successful case studies and tangible business outcomes (and vice versa).

However, it should also be noted that there actually are numerous “good advise and amazing concepts” born from projects (supported by government research or charity funding), but very few of them are managed into commercial development. This can either be attributed to the concern regarding the cost-effectiveness as the project prospect is niche, or, in many cases, that the commercial viability is not carefully considered in the design and development process:

> we are caught up with the process and don't think too much how are we going to sell this.[05]

As a consequence, there are very limited presence of successful business cases and outcomes, which in turn intimate people away even they do see a big commercial benefit.

> It is currently a challenge to make inclusive products desirable and normalised until there's a lot of age-friendly products out there, this is a chicken and egg stuff.[13]

It is also worth noting that businesses can be very careful to promote their product as “inclusive” or “age-friendly” as “in some way their brand identification is contaminated”. This further highlight the challenge of perpetuating negative stereotypes and attitudes towards ageing in the wider society.

04

Artificial Intelligence meets Inclusive Design

The rise of AI has introduced new possibilities and challenges in DfA, prompting inclusive designers to reconsider their role, tools, and processes. This chapter explores inclusive designers' perceptions of AI, their concerns, and its potential role in ageing focused design.

The attitude towards AI

Inclusive designers approach AI with a mix of optimism, curiosity, and pragmatism. While they recognise its potential to assist in design processes, they remain cautious about its current limitations and uncertain about its long-term implications.

There is a generally positive outlook on AI's role in supporting ageing-focused design, with some expressing excitement about its future applications:

We haven't found the best way to use it yet, but I'm sure there's a world of possibility.[05]

It's exciting—we try to see it in a positive way because it will be part of our lives.[07]

Some express mixed feelings, acknowledging AI's efficiency while questioning its trustworthiness. Others highlight the uncertainty surrounding AI's role in creative work, noting that while its potential is vast, misinformation and fear remain obstacles to adoption.

People in creative industries are considering how best to adopt AI, but there's still a lot of misinformation and fear.[06]

Overall, design practitioners recognise that AI is here to stay and are experimenting with ways to integrate it into their work. While they don't yet have full confidence in its capabilities, they acknowledge that AI will inevitably reshape aspects of design—it's just a matter of finding the right applications.

Where AI adds value to design

Given a mixed attitude towards AI, a “light-touch approach” can appropriately describe the current use of AI in everyday design and research. AI is widely regarded as a useful supplementary tool rather than a standalone creative force in design.

Design tasks that AI helps

Filtering key information

Locating relevant insights and key focus areas from large volumes of data

Creating design assets

Generating icons, images, and other graphical elements for design projects

Inspiring ideation

Supporting early-stage concept development by generating diverse ideas and creative prompts

Generating text content

Assisting with writing tasks such as drafting text, structuring ideas, and refining wording

Providing visual references

Assisting in mood boards, stylistic exploration, and visual inspiration

Critiquing and identifying gaps

Reviewing research plans and highlighting missing elements or potential blind spots

AI as a creative partner

AI is widely used in early-stage concept development, supporting divergent thinking and visual style exploration:

- Generating visual references: AI helps create mood boards, colour schemes, product form studies, and stylistic variations.
- Quick scenario building: AI-generated visuals allow designers to externalise ideas rapidly, facilitating discussion and iteration.
- Assisting in content generation: AI is useful for drafting product-use scenarios, expanding ideas, and structuring narratives.

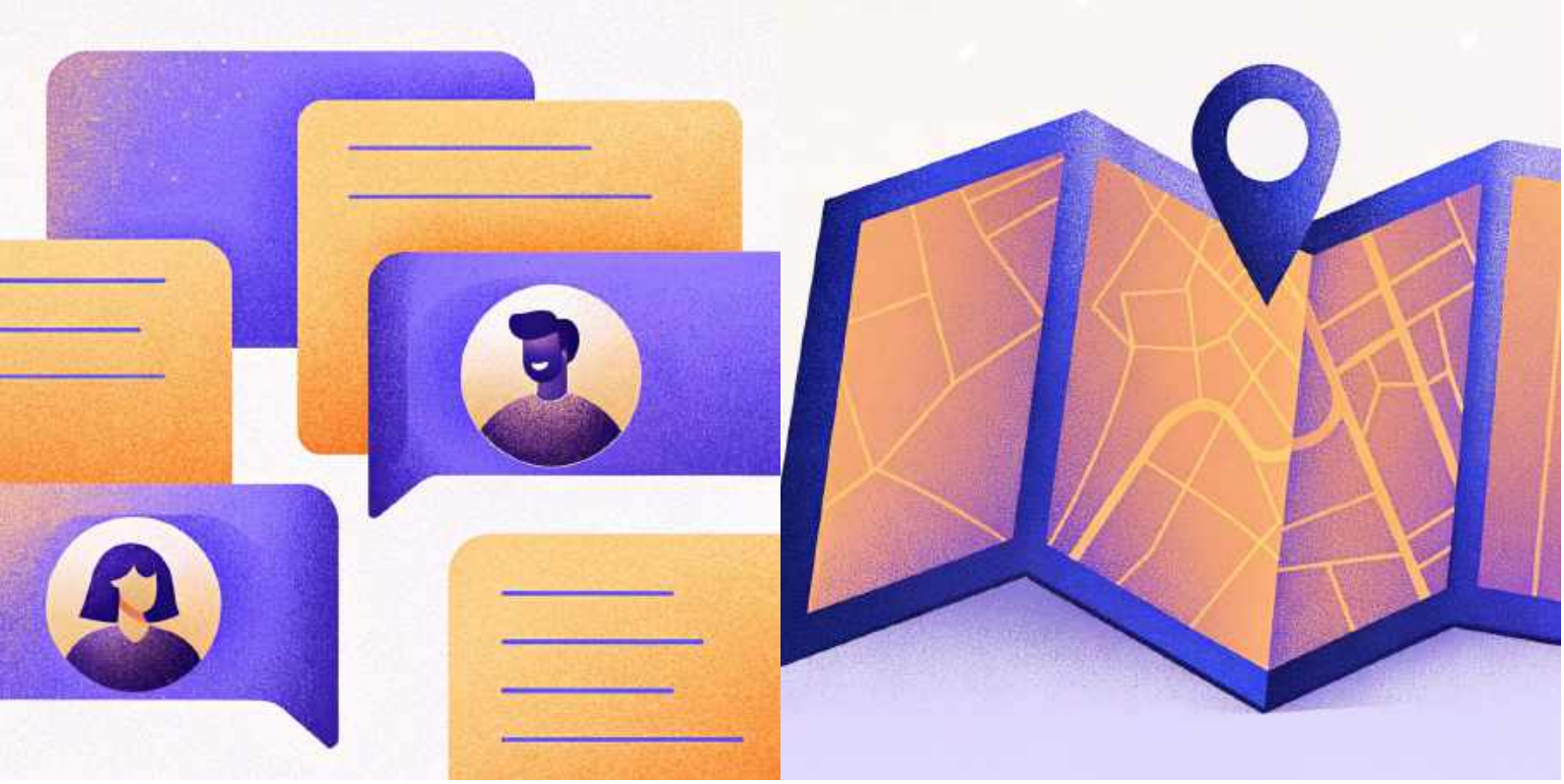
AI creates a lot of things, and then you decide which bits to incorporate into the next stage.[06]

In the early stage, it can broaden our mind rather than replace existing tools.[07]

AI as an efficiency booster

AI plays a supporting role in the design process, automating repetitive tasks and streamlining workflows while leaving decision-making and creativity to humans:

- Reducing manual workload: AI is used for tasks such as translation, adding voice-over, and transcription, freeing up time for higher-level design thinking.
- Drafting and refining content: AI assists with social media posts, work messages, and text optimisation.
- Generating design assets: AI is used to create icons, images, and visual elements for ongoing projects.



AI as a research assistant

AI is increasingly being used to support research activities, from structuring questions to identifying gaps:

- Drafting research materials: AI assists in phrasing interview questions, refining project plans, and structuring surveys.
- Identifying gaps and biases: AI can be used to critique findings, cross-reference data, and highlight potential blind spots.
- Locating relevant information: AI helps filter through large amounts of data, allowing researchers to focus on core insights.

AI as a knowledge explorer

Built upon a huge amount of information, AI is also used as a knowledge explorer by designers, helping them expand their understanding, challenge assumptions, and explore new directions:

- Expanding perspectives: AI responses can be insightful, helping designers gain a macro understanding of topics they might not have explored otherwise.
- Stimulating exploration: AI is useful in the early stages of design, encouraging broader thinking rather than replacing existing methods. It is agreed that AI should not solely be used to seek answers but ask questions, using it as a check against their ideas.

> AI is more of a default starter than an end result—it helps us seek questions rather than just answers.[07]

The limitations and applicability of AI in design

While AI has found a place in design practice, its limitations remain clear and multifaceted. Designers describe their experiences with AI as a mix of trial and error, cautious optimism, and persistent gaps in what it can deliver.

The struggle of communicating with AI

One of the biggest frustrations designers face is getting AI to understand what they actually want. Even when input is well-structured, AI often misinterprets requests, requiring multiple iterations to get a usable result. The process can feel more like a negotiation than a collaboration:

> It often requires many rounds of communication to let AI understand me.[10]

Using AI effectively isn't just about having the right tools—it's about learning how to ask the right questions:

> It's only as good as the questions we are asking.[14]

This means that AI isn't always the effortless time-saver it's made out to be. Instead, it requires commitment, trial and error, and a learning curve for users. Until AI improves in contextual comprehension, its usefulness will remain highly dependent on the skill of the user in navigating its limitations.

> We are in an exploratory stage—not just AI, but our ability to interact with it is still developing.[03]

Human has to be the gatekeeper

Despite AI's ability to generate content, it lacks the discernment to determine what is meaningful, relevant, or aligned with human needs. It is widely acknowledged that human should always be the necessary gatekeepers, ensuring that AI's outputs are appropriate.

We always need a human in there; AI cannot fully understand or process complex human behaviours.[06]

AI often produces statistically plausible but contextually flawed content which is critical in design. Therefore, it is highly stressed that every AI output must be interrogated, making fact-checking and verification essential. A useful strategy is cross-referencing AI-generated insights with multiple sources, by "comparing the results across different tools to check for consistency and trustworthiness".

Beyond assessing accuracy, using AI in everyday design work entails rewriting, restructuring, and even reinterpreting AI's outputs. AI is therefore treated as a starting point for any tasks rather than a definitive answer—it is a first draft, not a final product.

You can get some basic scaffolds, take none of it for granted, you still have to examine all of it and build on top of it.[13]

AI vs. Human creativity

Even if AI improves in functionality, it will still face core limitations that separate it from human creativity and understanding:

- AI lacks lived experience: It cannot fully grasp emotions, social behaviours, or cultural nuances.
- It refines rather than creates: AI is best at optimising existing ideas rather than generating something truly new.
- Bias is baked in: AI models are only as unbiased as the data they are trained on, leading to inherent distortions.

It is also felt that AI-generated content is becoming predictable and uninspired, leading to creative fatigue:

There's already boredom around those AI-generated images.[13]

AI's role in design: still a work in progress

For now, it is agreed that AI remains in an experimental phase, with designers testing its limits and waiting for it to mature. Some even describe AI's outputs as impressive but impractical, generating work that may look polished but lacks usability in real work. Until AI moves beyond surface-level content generation and develops a deeper understanding of context and functionality, its role in design will remain limited to specific and assistive tasks.

It is particularly weak in areas requiring deeper reasoning, such as interaction design, user experience, and service development. For many designers, AI is not yet reliable enough to be fully integrated into client work or mission-critical projects.

> We don't use AI in client work; we're not confident that it's there yet.[05]

AI has clear benefits in design but also clear limitations. It excels at automation, visual generation, and content assistance, but struggles with deep creativity, intuition, and user-centred design. Designers stress the importance of human oversight, validation, and refinement, reinforcing that AI is not a replacement for critical thinking, decision making, or creativity.

Where AI helps

Visual exploration

Assisting with mood boards, style guides, and aesthetic variations.

Early-stage ideation

Generating a broad range of concepts and possibilities.

Content assistance

Supporting writing, structuring ideas, and refining text.

Where AI Struggles

Interaction & experience design

AI cannot yet create intuitive, functional user experiences.

Decision-making in research and strategy

AI fails to grasp human complexities, lived experiences, and nuanced needs.

Adapt to real-world contexts

AI-generated solutions often feel regionally or culturally disconnected.

Concerns about AI in design

The identified the limitations of AI in design workflows further expand to reflections on concerns of AI that spans from ethical, social and professional dimensions.

Bias and the risk of reinforcing stereotypes

One of the biggest concerns is that there's structural bias in AI. It is trained on existing datasets, which means it inherits and perpetuates societal biases. Without critical oversight, AI risks becoming an amplifier of biases, misinterpretations, and shallow outputs. For example, AI-generated visuals often reflect youth-centric aesthetics, reinforcing an ageist perspective that fails to represent diverse populations:

> AI-generated styles are more youth-obsessed, which distorts the reality of ageing.[03]

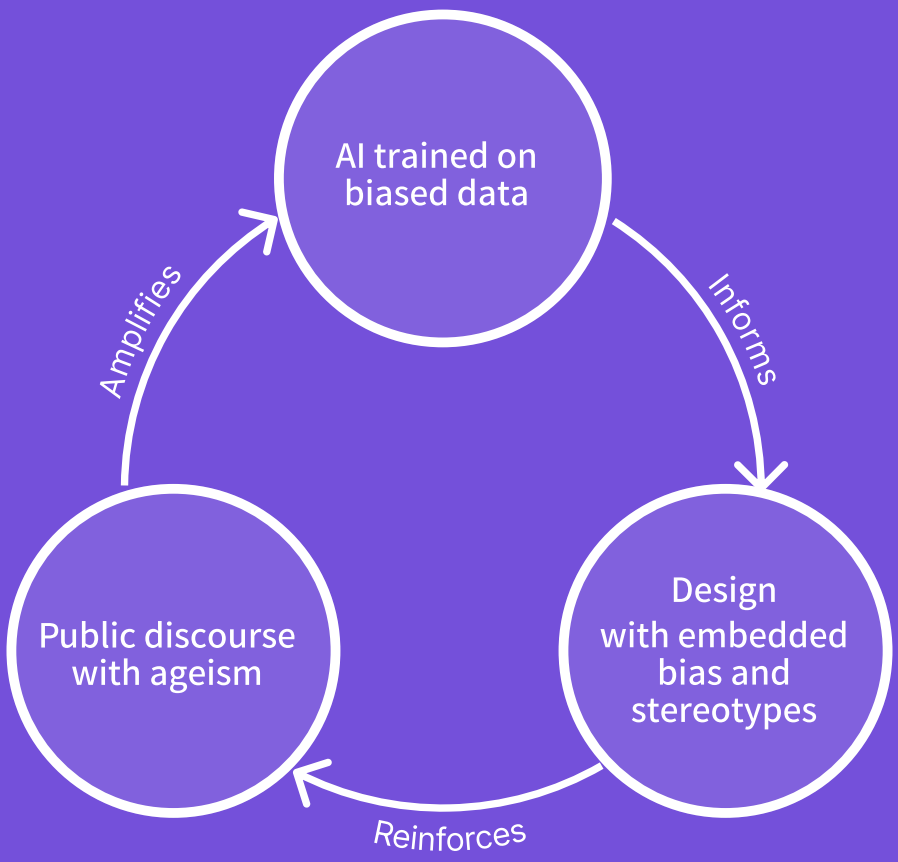
The possible consequence is that AI-assisted decision-making in research and design can reflect the biased assumptions of the data it was trained on:

> A big danger is that AI produces biased and false results, which can mislead researchers and designers.[07]

When applied in designing for the ageing population, the concern grows even more significant. Since AI training data often comes from tech-savvy users, it excludes many older adults, leading to design solutions that fail to serve the full spectrum of users:

> There's a lot of confirmation bias when designing for older adults because the training data only includes those who are fluent with computers.[14]

In turn, AI reinforces stereotypes about ageing—depicting older adults as frail, passive, or technologically incapable. This vicious cycle of bias threatens to make AI-driven design less inclusive rather than more innovative.



A vicious cycle of designing with AI

Misinformation and misinterpretation

AI's approach to generate content also raises serious concerns about misinformation. Similar to the hallucination in other application arenas of AI, designers report that AI often misinterprets the intent behind a request, producing inaccurate, misleading, or entirely fabricated information.

The risk is particularly high when AI is used in design research. While it can efficiently generate summaries, it cannot verify the reliability of the sources it pulls from. This can lead to disinformation being introduced into the design process, which then influences decision-making. It is therefore critical to ensure that "everything (generated by AI) has to be interrogated".

The ethical use of AI

Another fundamental concern is trust—both in terms of how designers interact with AI and how end users perceive it. Among designers, trust in AI remains conditional—it requires constant validation, ethical oversight, and a clear understanding of its limitations. Based on participants' experience, older adults remain highly skeptical of AI-generated solutions:

The majority of older adults are mistrustful of AI.[13]

This trust issue is deeply connected to data security and privacy concerns. Many designers worry about how AI processes sensitive information and whether confidentiality agreements are at risk. Without greater transparency and safeguards, trust in AI will remain a major barrier to its widespread adoption in design, especially in designing for ageing population. In application fields such as healthcare, where medical and personal data must be handled with extreme care. Without strong ethical guidelines, AI's ability to process and store sensitive information could lead to significant breaches of trust.

If we are not in control of data, how can we ensure the ethical use of AI in ageing focused design?[14]

Intellectual Property: a grey space

The use of AI-generated content raises complex legal and ethical questions about intellectual property—a key concern of design. It is not clear who owns AI-assisted designs and whether new forms of IP protection are needed, and the IP ownership various across different AI applications. There is a growing grey area around authorship, as AI blurs the line between human creation and machine-generated output. Without clear regulations, designers face legal uncertainty about how AI generated work can be used, credited, and protected.

Apart from design ethics, sustainability questions around the increasing adoption of AI becomes an emerging concern. For example, it is aware that the computational power required to train and operate AI models consumes large amounts of energy.

Additionally, AI's integration into design education is causing uncertainties. While AI can assist learning, some worry that over-reliance on AI could erode fundamental design skills including creative thinking and visualisation.

How AI might shape the design industry

AI is not just a tool—it is a force reshaping the design profession itself, in both positive and negative ways. The future of design careers in an AI-driven world, however, remains an open question.

Job displacement?

There is an undercurrent of anxiety about AI's ability to automate certain design tasks, potentially reducing the need for human designers. Some designers see AI's growing presence raises fears of job displacement.

On the other hand, designers also agree that avoiding AI is not an option—instead, they must adapt to the changing landscape. Rather than replacing designers entirely, AI is expected to shift the nature of design work, eliminating repetitive tasks while placing more emphasis on high-value creative and strategic thinking.

> AI threatens visual designers in terms of efficiency; it's taking over some tasks that used to require manual skill.[10]

> At the organisational level, there's concern that AI is making design feel less necessary.[11]

A new skillset for designers

With AI becoming embedded in design workflows, new skills are required to navigate this shift. Designers must develop AI literacy, which involves:

- Knowing AI's capabilities and limitations: Understanding what AI can and cannot do allows designers to use it effectively without over-relying on automation.
- Learning how to ask the right questions: Since AI is only as good as the prompts it receives, designers must refine their ability to communicate effectively with AI.
- Selecting and curating AI-generated content: Designers must distinguish between valuable and misleading AI outputs, ensuring that AI remains a tool rather than a decision-maker.
- Ensuring ethical use: Designers must navigate the moral and policy implications of AI, using it responsibly and transparently.

Designers' value in an AI-driven world

Despite AI's increasing role, it is widely acknowledged that designers remain at the core of the creative process. Instead of being a replacement for human designers, AI is more regarded as a tool that still requires human oversight, creativity, and judgment:

AI helps with efficiency, but design creativity and value assessment still count on people.[03]

For example, designers spot specific aspects of design simply cannot be automated:

- Brand identity and storytelling: AI can generate visuals and text, but building a brand and conveying meaning still require human intelligence.
- User-centred thinking: AI does not understand emotion, behaviour, or real-world user needs in the way that designers do.
- Complex problem-solving: The more complicated parts of AI-generated content still require human processing.

Ultimately, AI's value in design depends on the designer's ability to assess, refine, and integrate its outputs:

You need to be able to assess the results; it depends on how you make use of it.[10]

An optimistic view is that rather than replacing designers, AI is more likely to become an amplifier of human creativity, allowing designers to work faster, explore more possibilities, and push creative boundaries.

The open questions

Beyond automation, AI is shaping how designers think and work. Many point out that AI is already embedded across various tools and processes, and influence daily design decisions. As AI continues to evolve, it is likely to reshape the design profession by expanding the way they think, create, and solve problems. This raises important questions (where there is no answer yet):

- How will AI change the way designers interact with tools?
- What new behaviours and workflows will emerge?
- How can designers adapt to an AI-driven design process?

The possible changes associated with AI covers not only new ways of designing, but also new formats of design delivered to end users, raising questions for possible new interactions paradigms.

How can we design for the future interactions between humans and AI? [07]

Looking forward: expectations, ideas, and inspirations

Despite a mixed attitude towards AI, design practitioners envision an future where AI brings positive impact on design workflow, inspires new frontier of design, and contribute to a more inclusive world.

Seamless integration into the design workflow

Designers expect AI to be integrated into their existing workflows in more natural and intuitive ways, instead of functioning like a disconnected tool. This reflects the current perception that AI's core value lies in automation. By speeding up particular types tasks, AI holds the potential to enable designers to focus on higher-level creative and strategic work.

It is worth noting there have been small-scale and experimental applications that align with those identified scenarios and tasks. For example, designers can deploy image generation and editing models by customising personal AI-assisted workflows for tasks such as 2D-3D image generation, and bulk image editing. However, there are challenges such as how to ensure the quality consistency, steep learning curve, and hallucination when utilising existing AI applications.

Where AI can streamline design

Automating repetition

- *Bulk image editing*
- *Transcription*
- *Data management*

Design iteration

- *Generating multiple variations to build on ideas*

Bridging 2D & 3D design

- *Quickly converting 2D sketches into 3D models*
- *Swift visual material generation*

Complex data processing

- *Meaningfully annotating diagrams*
- *Managing insights from research*

Adding new perspectives and addressing diversity

AI's role in expanding creative possibilities is another major area of expectation. Designers hope AI can introduce new ways of thinking, encourage fresh perspectives, and even shape new design paradigms.

The way how AI is trained and content is generated indicates that it holds great potential in adding alternative viewpoints in brainstorming when partnering with human designers. The huge (and keep growing) cross-disciplinary knowledge base also provides the possibility of identifying new opportunities that may have otherwise been overlooked and sparking new design opportunities.

> AI helps us look at design problems from creative lenses we may not have considered before.[07]

> Compare what AI provides and what you can observe in reality, then identify the opportunity.[10]

AI's potential of offering a broader perspective in design also indicates its prospect of helping address the diversity in population, effectively contributing to inclusive design. Some of the task vision includes:

- AI backed by more comprehensive and diversified data: Expanding beyond anthropometric data to include psychological, cultural, and behavioural factors.
- Support inclusive persona generation: AI could generate personas rooted in real, validated data
- Enable multicultural and multi-perspective insights, by bridging different languages, time zones, and cultural perspectives.
- Empower accessibility through multi-modal interface: AI could enable more effective interaction methods (e.g., through more precise and timely voice recognition) to increase accessibility of design.

Despite the bright outlook, designers stress that it is important to combining and comparing AI-generated perspectives with real-world insights, further emphasising the importance of preserving humanity in design.

AI for exhaustive search & generating infinite possibilities

“Leaving repetitive and less valuable work to AI” highlights AI’s role as a efficiency booster for exploring and generating almost infinite possibilities. For example, at the insights gathering and ideation stage, AI can help generate the all different combinations of selected shape, colour, and layout etc., in a very short time, which can be time-consuming if designers do it manually. The full range of possibility will not only serve as valuable insights but also solid evidence in design decision-making.

Exhaustive search can save huge amounts of time by exploring all possibilities.[11]

AI’s ability to rapidly explore all possible design variations could reshape how designers approach problem-solving. Some designers see this as a potential paradigm shift— changing how design is done at a fundamental level. Designers will be able to make decisions based on a thorough understanding of the landscape consisting of all possibilities, instead of limited, prioritised, and possibly biased options.

AI's potential in assisting design evaluation

AI’s potential as an evaluation and simulation tool is another promising direction. How AI is defined and structured indicates that it can be helpful in assessing and predicting how people think and interact with designs. For example, AI is expected to streamline the evaluation of the readability and legibility of written or visual content, especially taking into account the diversity of audience. For inclusive design practise, evaluation tool benchmarked by older adults’ capability data emerged as a promising direction. In this way, user experience and inclusion can be measurable, while designers’ decision making would be more explainable and evidence-based.

AI’s ability to simulate human interactions and behaviours could provide new ways to test designs before implementation. If AI could be fine-tuned by inputing data about different human characteristics, designers can utilise AI simulations to interrogate design outcomes. For instance, a proposed approach is to simulate older adults using AI-powered digital twins and evaluate how they interact with the design.

Beyond generic AI models

Despite the positive vision, it is agreed that for AI to be truly useful, it must be built on valid, reliable data that can meet the particular needs from design activities. AI powered knowledge bases that are specifically tailored for inclusive design, instead the currently mainstream generic models, exhibit greater potential. Therefore, moving beyond generic models and offering contextually rich, project-specific insights emerge as both challenges and opportunities.

> I don't need generic AI insights; I need focused and specific ones for design for ageing.[10]

AI opportunities for inclusive design

A comprehensive experiential knowledge base

A repository of real-world design insights from diverse communities

Standardised databases on older adults

AI trained on accurate, context-based capability data rather than general trends

Data-backed design guidelines

AI could provide evidence-based recommendations, making inclusivity more measurable and actionable

The bottom line: keeping AI human-centred

While AI offers exciting possibilities in design, Designers agree that preserving humanity is not just an aspiration but a fundamental necessity for the future of AI. As AI advances, it should do more than optimise workflows. It must recognise, respect, and contribute to the subtle, deeply human aspects of design. For example, storytelling, brand identity, and emotional resonance are areas where human intuition remains irreplaceable. When engaging users, for example, through participatory design, face-to-face collaboration and shared experiences are essential, and while AI can assist in co-design, it cannot substitute the value of direct human interaction.

AI has demonstrated the ability to generate vast possibilities. However, it should should complement, not override, human judgment, ensuring that final design decisions remain guided by human insight and ethical considerations.

> We need to keep humanity and society at the centre of how we think about AI.[09]

> AI helps us do research, but it should never replace the core human expectations in design.[07]

Conclusion

This report has explored how inclusive design practitioners design for the ageing population in the context of AI-integrated design. Through rich qualitative insights and practical reflections, it highlights both persistent challenges and emerging opportunities for designing more inclusive, empowering solutions for ageing populations.

While inclusive design is gaining broader recognition, its practical application remains shaped by systemic barriers. At the same time, the rise of AI presents both promise and risk, offering new tools for ideation and evaluation, but also raising concerns about bias, trust, and creative integrity.

Looking ahead, future efforts should prioritise developing age-inclusive datasets and AI tools grounded in real-world experiences. There is also a clear need for systematic support—from industry, policy, and education—to bridge the gap between inclusive design ideals and practical implementation.

A proactive, evidence-based, and human centred design agenda is essential not only to improve outcomes for older adults but to advance the broader field of inclusive innovation.

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Scan the QR code to visit the project website for the latest updates.

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