Ageing in Place
Smart Home Workshop

Global Centre for Modern Ageing

LifeLab

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Contents

'Opened my eyes to the diverse interests and values of the people who attended'
- workshop participant

Introduction

Living life to the fullest while ageing at home

The world population is ageing rapidly and most people wish to live independently in their homes as long as possible. This requires their homes to change to support the older residents.

The Global Centre for Modern Ageing LifeLab organised a facilitated contextual workshop to understand better older people's perspective on ageing in place. In October 2018, 13 older people living independently in the Adelaide metropolitan area and five companies/ entrepreneurs were invited to participate to join a co-design session.

Seniors' insights related to ageing in people's home were captured in a systematic way.

Key findings of the workshop strengthen the view that as people age they want their homes to support them physically, socially and with services. Homes are both physical places to live in and hubs for social contacts and services.

The World Health Organization has developed a checklist of the essential features of age-friendly cities that make a community more liveable and manageable for citizens, providing practical guidance about how the pillars of active ageing can be achieved.

Workshop finding: Most valued aspects of home:
- Familiarity and personalisation
- People and companionship
- Memories
- Connections
- Security and privacy

In addition, new requirements are created for homes as part of modern ageing.

One participant of the workshop phrased it: "Home needs to keep you active."

This illustrates well the current trend of activating and monitoring technologies entering homes.

Among new services available to older residents, there are plenty of solutions trying to keep people's physical and cognitive functioning up to speed.
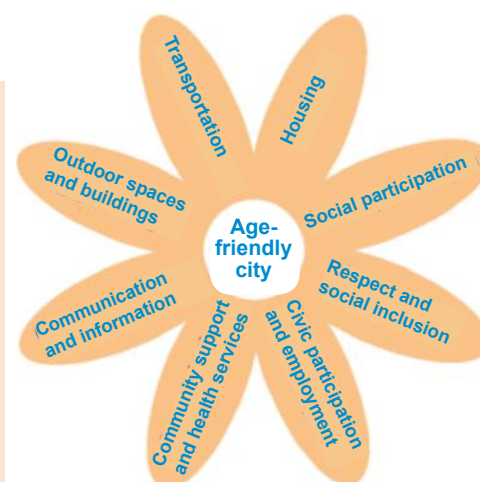
For many participants, this was the first time they had been exposed to these types of solutions, with most being more familiar with traditional solutions such as ramps and railings.

New smart technologies for living, care and health services are entering the homes of people – but do they meet the real needs of people?

The concept of the workshop was to bring together targeted older users and entrepreneurs working in the sector, to explore real user needs related to ageing in place.

The workshop was the first in the series in LifeLab and so the scope was broad, embracing all aspects of ageing in one's home. We wanted to draw a high level picture of all possible aspects to age in place healthily and happily.

All in all, the Age in Place workshop result - with authentic user

The workshop brought together older people, businesses, entrepreneurs and researchers to explore the context in which people age at home.

voices - generated an almost identical picture of requirements for ageing well as has been documented by the World Health Organization's (WHO) age-friendly cities domain framework.

Thus, the workshop demonstrated that 21 participants may well produce almost the same content as world-leading experts – and additionally they are able to bring in their own stories and circumstances.

This workshop was a starting point, setting the scene, for the next projects which will get into more detailed and contextual themes.

These projects could bring valuable insights to product and service concepts and design. The next similar workshop could focus on, let's say, kitchen or smart lighting solutions to get an in-depth understanding of contextual user needs.

An important aspect of the co-design workshop is actual experience of the interaction between the people, companies and researchers.

The workshop is a rich learning experience for everyone. Everyone gives something and takes something else home.

As one participant commented in his feedback: "A very interesting meeting that opened my eyes to the diverse interests and values of the people who attended."

LifeLab is looking forward to organising similar workshops on selected themes with business partners.

These workshops can focus on a variety of themes and sectors.

If you are interested, please contact us.

Key insight from the workshop
As people age, they want their homes to support them. The main gap experienced is a lack of information and ease of access to services to modify one's home.

The market landscape

The majority of older people are healthy and active and 90% of them want to live in their own homes as long as possible [1].
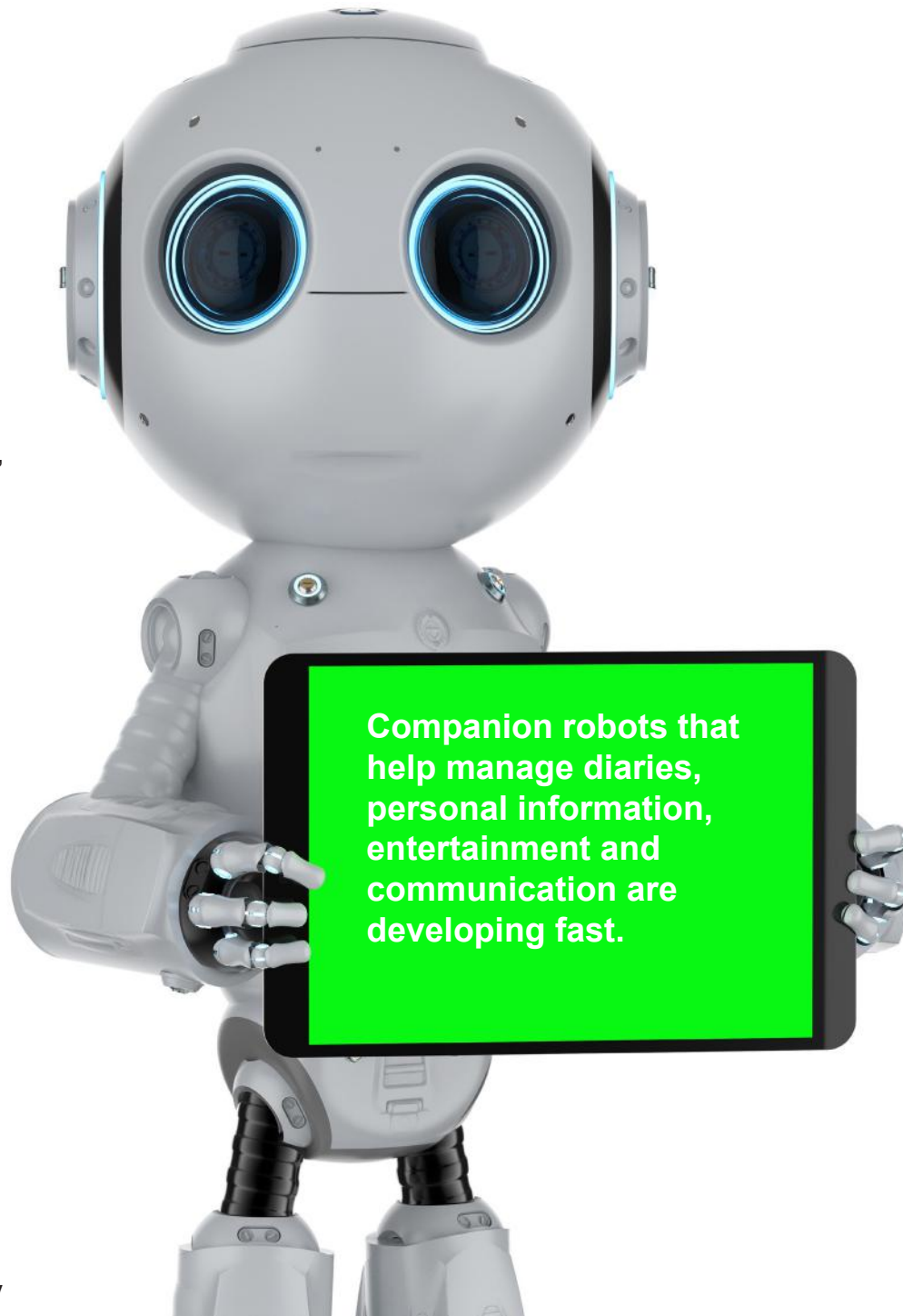
Well-designed homes and age friendly neighbourhoods have a critical role to play in enabling people to remain independent and connected with their community as they age.

People are working longer, travelling more, and they expect more.

The current generation of Australian baby boomers is the most educated, financially secure, technologically aware and experienced group of seniors that has ever lived. They have become comfortable with the idea of inanimate objects such as their car talking to them, and now they are getting used to conversing with devices also at home.

While populations are ageing rapidly, more and more digital services, care solutions and new kinds of technologies aim to support people to live at home for longer. Medical services, banking services and shopping are already increasingly digitalised and delivered directly to homes. Most consumers are familiar with the traditional range of physical and mechanical aids that are available to support ageing in place, such as wheelchairs, beds, chairs, personal alarms, ramps and railings.

These kinds of solutions are also getting

Companion robots that help manage diaries, personal information, entertainment and communication are developing fast.

smarter and connected to digital services.

All of this and new emerging services will change older people's daily routines, mobility needs and connections to the world.

An older person's home can be designed

Smartphone apps can connect an individual older person's network, giving peace of mind to family, carers, service providers and friends.
Pictured is CareApp.
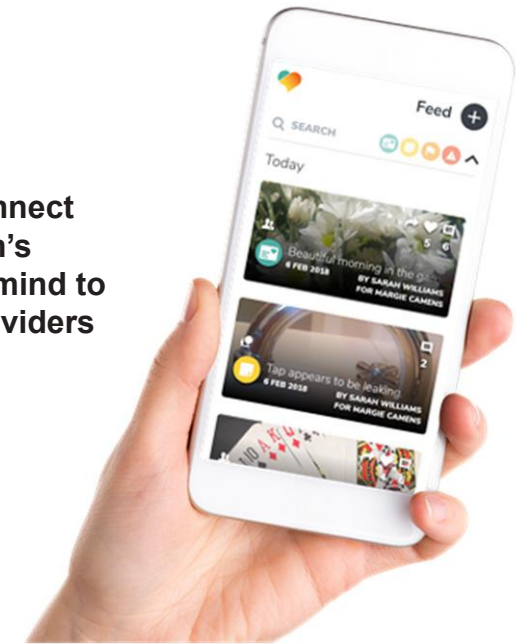
to support continued independent living in the community. And while digital innovation can enable, improve, support, augment and empower, it may also strengthen human communication and relationships.

The rapidly growing smart living for ageing population market holds significant economic opportunity.

It's estimated that 10% of all home remodel-

ling serves for purposes to age in place. More than that, the smart home market as well as assistive health and care solutions for home are predicted to multiply in the coming years.

The global smart home market is expected to grow considerably, with a market revenue forecast of nearly US$54 billion by 2022 compared to US$24 billion in 2016, according to Zion Market Research [2].

What is co-design

Co-design is a process that enables end users to be involved in the creation of products and services intended for them.

Originating from the 1970s Scandinavian participatory design movement, co-design is more than a process of simply consulting or seeking feedback.

It is a fundamental change in the traditional designer/developer and end-user relationship that recognises end-users as experts. For older people, this is especially empowering.

Co-design also makes sense from a business perspective because it ensures that a product, service or solution is fit for purpose and will be adopted by its intended end-users.

Living laboratories apply co-design techniques and other methods by bringing together industry, researchers and community to participate in product and service design, development and testing in simulated and real life settings.

The workshop

Age in place - an opportunity to live long and well at home

The workshop addressed the global trend that older people want to live as long as possible in their homes. As the population ages, homes need to adjust to support older people better.

What kind of future home solutions related to safety, security and wellbeing will help 65+ people to live healthier and happier in their homes as long as possible? What will happen in homes as they become more service hubs for older people?

The Global Centre for Modern Ageing's LifeLab organised a workshop, where some future solutions were presented to older people in a home-like setting fitted out with a range of "smart devices" to help older people to live at home for longer.

The workshop sought to elevate the user perspective and contribute to the understanding of what kind of future solutions might help ageing in place.

Insights from the seniors were captured throughout the facilitated workshop in response to different stimuli and questions.

Companies and entrepreneurs participated alongside the older people in the co-design sessions.

This report presents the data that was collected during three key activities and provides an initial thematic analysis to identify the key focal points of discussions.

The raw data is presented in an appendix to this report.

Elevate user perspective and contribute to the understanding

Thought starters used in the workshop

Apia — The Future of Over 50s: Home

Microsoft: Future home

Umea University of Design, Sweden: Bots - Battling Boredom in Smart Homes https://player.vimeo.com/video/149985577

The workshop

Date: Thursday 18 October 2018
Time: 10.00am – 14.00pm
Venue: Global Centre for Modern Ageing/
         LifeLab @ Tonsley

Project team
LifeLab: Veera Mustonen, Lise Windsor,
         Chris Russell, Jennifer Taylor
Facilitators, match studio, UniSA:
         Jane Andrew, Aaron Davis

A group of 13 older citizens participated alongside five companies.

The citizens were recruited through the City of Marion and through GCMA's contact data base. The participants live independently in their homes and were aged in their 60s through to their 90s.

Match Studio facilitated the discussion with Aaron Davis and Dr Jane Andrew leading participants through the activities designed to stretch their thinking about the role their homes could play in supporting ageing well, and to enable critical reflection on the role of technology in the develolpment of future age-friendly housing models.

Participants took part in four main activities: two table discussions, informal marketplace sessions and a final knowledge download activity.

The results show a keen interest from the community in being part of the creation of new models of age-friendly housing and environments, and demonstrate the willingness of community members to engage with companies in the design and development of products, services and systems to support ageing.

Methods

The focus of the workshop was to understand the contextual needs and wants of people in relation to ageing in place. LifeLab was furnished as a home and some future home technologies were embedded in the simulated living room and kitchen areas. The workshop used methods of co-design, ensuring everyone's participation.

Activities

10:00   Welcome and introduction to the LifeLab
10:30   Icebreaker
10:40   Facilitated discussion 1: Ageing in place. How might your home age with you?
11:10   Morning tea and marketplace.
11:45   Future inspiration videos
12:00   Facilitated discussion: Linking visions and products to themes in discussion1.
12:25   Lunch + marketplace continues
12:55   Facilitated discussion: What makes your house a home?
13:15   Activity: Top 10 things that help my home age with me
13:30   Reflections and wrap up
14:00   End of the day

The companies

Companies with innovative solutions or interest in the ageing in smart home participated in the workshop. The company representatives took part in all co-design sessions with the older participants.

PEET (Tonsley Village)
Stuart Headland, Alan Miller
PEET – whose projects include the Tonsley Village – caters for people of all ages from first-home buyers onward, including a growing market of older people.
The PEET Group offers an experience in residential, medium-density and commercial developments, as well as land syndication and funds management.

B1Hub
Anup Raghavan
B1 Hub provides home automation devices, such as universal remote controller, home security system, home automation system and as a bridging device to connect home appliances, lighting, energy management and air conditioning. The B1 Hub creates home automation at what the company believes is an affordable price for consumers.

MedTEC South Australia
Stephen Blakeney
MedTEC South Australia is an industry-led organisation supported by the SA Department for Industry and Skills and the Federal Industry Growth Centre for Medical Technologies. It brings together Australian industry and research leaders in advanced medical technologies – connecting them with complementary thinkers and supportive investors. The group brings to life transformational projects in Health, Disability, Ageing and Assistive market sectors for the health and wellbeing of citizens and the growth of MedTech enterprises It achieves this through a collaboration between a deeply connected and outward-focussed group of supply chain, manufacturing, research and academic groups, and highly supportive government, infrastructure and investment organisations.

Care Konnect
Sean Grealy
Care Konnect is a suite of software that enables better communication, complaint management and service feedback in aged care.
It does this by connecting service providers, care, recipients and families as the solution on the Care Konnect mobile app which is secure, intuitive to use and in real-time.
This means service providers are no longer dependent on basic and insecure forms of communication such as email and telecommunication to keep families informed of their loved ones – and service providers gain feedback on their services.

Greg Megow, a workshop participant, also wore the hat of a user innovator. He brought along a prototype, showcasing how to solve his daily problem of accessing things and utensils in kitchen cabinets while kneeling down has become problematic. His wooden model illustrated a mechanical solution to rotate kitchen drawers. Other participants and companies gave him feedback and suggestions on advancing to the next step.

iCCnet CHSA
Nicholas Morfidis
E-health monitoring services were presented in the workshop by iCCnet CHSA. It provides a state-wide clinical network which supports the practice of evidence-based medicine and continuous quality improvement in the management of cardiovascular disease across regional, rural and remote South Australia.
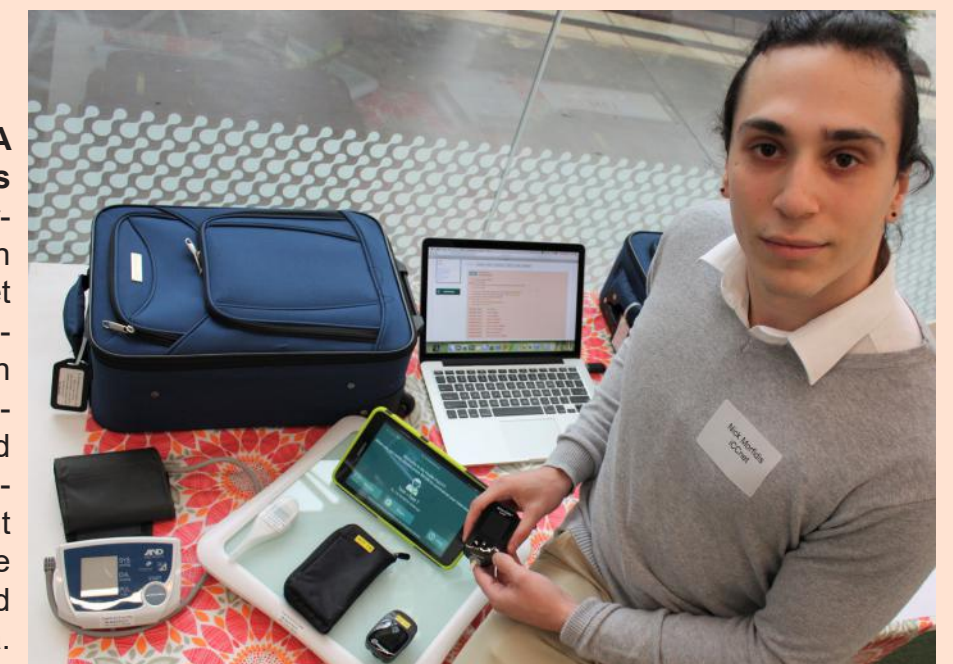
Key findings

Home sweet home

Home and future home is a theme that easily captivates most people. Home is the most familiar place for most people and many everyday activities are related to home.

Thus, when discussing ageing in place, most aspects of life are brought up.

The World Health Organization's (WHO) age friendly cities domain framework was used to categorise various input by the participants.

The participants touched on all the areas in the discussion and produced ideas for all the categories. The multitude of ideas of people reflect how diverse and rich places homes are for people. Even if homes are becoming more and more a place where people experience different stages of care, they still remain a primary base for personal experience and history.

The different layers of practices and human activities were brought up in all the discussions.

Participants discussed physical qualities of homes, services related to living, technologies assisting living and connections to the external world mediated by homes or home-based technologies.

The focus of the workshop was to understand how homes could age with people to match the emerging lifestyles of older people living at home and more connected smart technologies allowing totally new kind of services.

New smart technologies for living, care and health services are entering homes – but do they meet the real needs of people?

The data gathered through the workshop contributes to a better understanding of the global trend of older people wanting to live at home for as long as possible.

The facilitated thematic discussions and the participants' inputs yielded a rich material of needs and wants related to ageing in place.

Key fact
About 19 out of 20 people in Australia aged 65+ live in a household, not in residential aged care. [3]

Transition points

Many participants raised in the discussions that they are currently thinking about their next move related to their way of living.

They may have recently become empty nesters or widows and feel that their current houses are too big. Or they have started to anticipate the coming years and want to ensure that their home can support them while they age.

Another transition point seemed to be when a partner becomes ill and requires constant care or when they have a fall or other injury themselves.

All in all, there seems to be several transition points when older people reconsider different kinds of housing options.

Shall they invest in changing their current home or move to another one – or maybe even think of lifestyle or retirement village options?

A clear need related to these transition points was captured in the workshop.

People would value collated information on different kinds of options and services.

Navigation of services and support is complex

Especially renovating one's home to support the future days to come, requires a large number of decisions to be made.

At the moment there is no one-stop shop to advise on different solutions (both physical, digital and services) to support ageing in place.

Participants were concerned about how they know whom to trust when there are lots of people selling new products and services, and as prospective buyers they may not feel knowledgeable about whether the product is the best option for them.

A key insight from the workshop was that while there is a plethora of services and support available, navigation of these is complex and not generally well understood.

Most valuable things at home

When discussing home, the most valuable things people associate with it are their very personal connections and memories.

This became clear also in the workshop. Family members and histories make the place a home. This is good to keep in mind when bringing any new services to homes.

The new products and services need to integrate with and support the existing social structures and memories.

When asked, participants identified a large number of features they would like to have in their homes to support living at home longer. Based on the answers people produced, the things that are the most valued, are the following ("What makes your house a home?"):

1. Familiarity and personalisation
2. People and companionship
3. Memories
4. Connections
5. Security and privacy

Other important things include independence, affordability and nature.

(See Appendix, Table 3: Responses to "what makes your house a home")

Frequency analysis word cloud of terms used by Group A

Frequency analysis word cloud of terms used by Group B

How might your home age with you?

People were asked to identify the top things that will help their home age with them.

These insights were analysed against the framework of The World Health Organization's (WHO) age-friendly cities domain framework in an Australian context, and they contributed particularly in the domains of housing, outdoor spaces and buildings, social participation and communication and information. The participants touched all the themes presented in WHO's framework in the discussion and produced ideas for all the categories.

The frequency tables above summarise the most commonly used terms by two discussion groups.

Struggles at home

All the participants of the workshop lived independently in their homes.

They all were able to pursue a relatively active lifestyle. Still, they were envisioning some discomfort living at one's home.

Based on the discussions and materials produced by the participants, they are concerned about some aspects that were already, or may turn, discomforts in ageing at home.

The most often mentioned ones were:

1.   Physical design of homes, to prevent falls, tripping and bending. Examples of hard ergonomic solutions included:
   a. Stairs
   b. Doors
   c. Lower (kitchen) cabinets

d. Current physical design not matching changing circumstances
2.   Access to relevant services and knowledge of how to access services.
3.   Information about new technologies and learning how to use them (e.g. activation and control of lightning)

When there is a problem or a need identified, there is also an opportunity.

So, all of these challenges could be seen as business opportunities for better design and services for people wanting to remain living at home.

(See Appendix: Top 10 things to help my home age with me).

How does technology displayed match the ways you want to age in place?

To broaden the scope of the possible future solutions, four companies presented state-of-the-art age-in-place solutions enabled by numerous technologies to the participants.

The participants displayed enthusiasm for the uptake of the kinds of products, services and solutions explored in the "market place".

In addition, three videos were shown of possible future scenarios of utilizing emerging high-tech solutions to age in one's home.

The participants had brought up few technology related ideas in the initial discussions, before this extended stimuli of future opportunities.

Intervention of more futuristic scenarios

Most of themes the participants had generated had little to do with advanced technology, so it was interesting to see how this intervention of more futuristic scenarios impacted the discussion.

Discussion 2 was to find out about that.

People were asked that "How might what you have seen link with your previous themes?".

This discussion was not as vivid as other conversations during the day. Participants did bring up some positive and negative attitudes towards new technologies and opportunities.

Still, it seemed that they had not yet had enough exposure to future possibilities to truly consider them.

(See Appendix B, table 2,
Issues raised during discussion 2).

Attitudes towards new technologies

More than the concepts and benefits and possible life-changing nature of future technologies, the participants discussed and commented on the individual features and usability of new technologies.

The most positive dimension of emerging solutions seemed to be the increased connection to family members, carers and friends.

A key point identified was that context matters. Whether it is the age of the older person, or the way in which they are living, the technology won't connect with them if it doesn't match their perceived timeline or way of life.

For one older participant much of the emerging technology seemed too far in the future.

Another thought there were good products that exist now to assist people to age in place – but perhaps they aren't used as much as they could be, because people do not know about them.

Several participants did take up some ideas in hand and were thinking about how to prepare their home for the next 10 to 20 years and that could include products like Alexa, or other DIY options such as changing lighting to suit people with progressing dementia.

New solutions merging physical and digital elements interested many participants.

The group discussed stair lifts but one of the entrepreneurs said people were hesitant about installing assistance devices which overtly emphasised their frailty or difficulties. Many of the

An underlying theme in this discussion of future technologies was trust

older participants agreed that they wouldn't want these devices on display because they were embarrassing. Other physical, technology-based devices participants thought could be useful were: temperature controlled water, a system to lock all doors at once, and the possibility of self-cleaning bathroom and windows.

An underlying theme in this discussion of future technologies was trust: While some concern was mentioned about data mining, some reflected that they "would like to see data mining used for my benefit", and others felt it was intrusive when they, for instance, received Amazon recommendations.

A couple of concerns raised were: "do I need this much information, and will I still connect with people?"

The ability to use new technical solutions seemed to be a real concern.

Currently some participants are accessing services such as local community centres or libraries, some offering intergenerational training and support for technology use.

Also identified as important was a system or service to help make changes so the house stays a home – which could be a specialist or mentor that guides older people.

The group discussed the possibility of local government leading this initiative, so instead of just helping with railings and other physical devices, local councils gave an overview of technologies like sensors that could also be added.

Top themes of ageing in place

The last activity of the workshop was to individually list Top 10 things to help my home age with me.

Participants produced a long list of the most important things they'd like their home to keep up while ageing.

Many of the responses were related to the physical characteristics of the homes.

The figure at right captures the most frequently mentioned themes in the responses of the participants.

The most frequently discussed and mentioned top themes are discussed next.

Frequency analysis word cloud of terms used to describe the top ways to help a home age with its occupants

Services

Requests for new kinds of services were repeated over and over again throughout the workshop – especially, information on access to different kind of services.

Most participants reflected some level of recognising change in their life stage and needs, and a problem identified was where to go to find the right advice or information to inform some of the choices they were making (or could see in the future) about how to age in place. Within this, some participants identified problems in knowing or specifying what might help them in the home as a barrier, and this was particularly emphasised with technology. So, new kind of information services were also proposed to understand the multitude of services available.

Secondly, the participants requested services to learn to use or to install new solutions or maintenance of new solutions.

While they were open towards new technologies, there was also an expressed need for support with learning how to use technologies.

One participant of the workshop phrased it: "Home needs to keep you active." This illustrates well the current trend of activating and monitoring technologies entering homes. The participants showed mild interest towards this kind of emerging services. Most likely they did not have enough experience of those to evaluate their place in their homes.

Good design helps

Design of the current homes generated a lot of discussion. There was some frustration with general poor design of existing objects around the home, like locks or bed legs that stick out.

Some positive areas identified were intrinsic to the design of the home, such as ample natural light, a wine cellar, and a loungeroom that has a nice outlook, which was identified as increasingly important as mobility decreases "so you don't feel confined".

"What people want is pretty universal," said Stuart Headland, development manager at Peet. "Good design is good design. We design homes to be comfortable and robust and which will last for decades."

However, even if some design principles for good design may be universal, the individual needs for different types of products and concepts vary a lot.

So, in terms of good home design for the ageing market, there are very different segments to serve. The discussion at one table uncovered a tension between wanting tools and products to assist aging in place, and the desire from some to ensure they didn't eliminate too much functional movement, "the stairs are my gym".

The group identified the need not to assume that older people need or want certain things, and instead that there is "no standard".

Safety

Safety was also brought up in most comments and conversations. Safety was related to physical safety, prevention of injuries, but also to access to people when needed.

Part of safety and security was also concern for privacy, including data privacy.

> **Key fact**
>
> Housing, household goods and services consume 21% of the annual spending of people aged 65-69. [5]
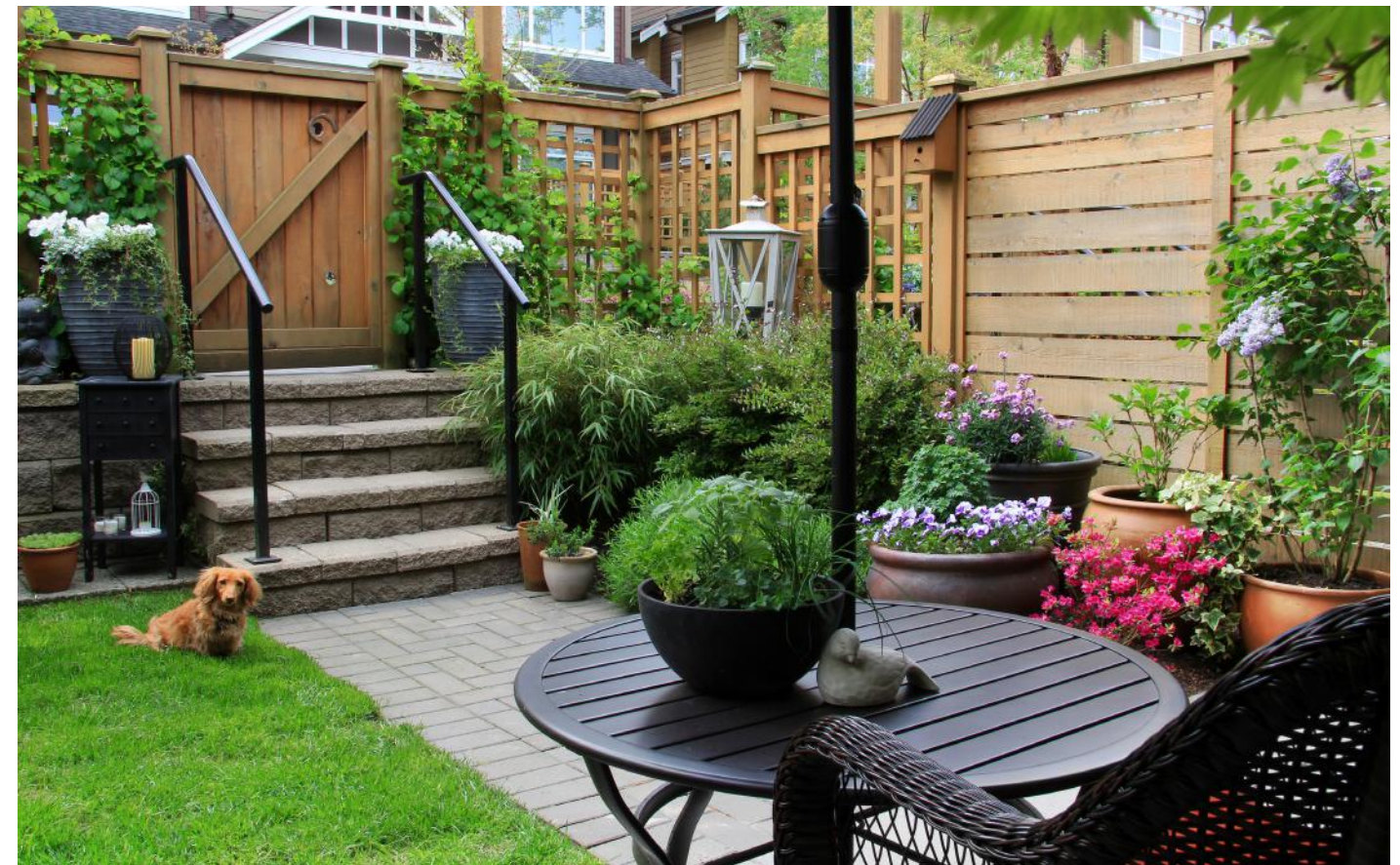
Access

Access was the most frequently mentioned single word. Access is related to all aspects of life at home: physical, social and digital.

Mostly people were concerned about their reducing mobility and were looking for physical support to move within their homes. Stairs, toilets, doors and floors should support the resident to move around the house safely.

People wanted to prevent falls, bending, injuries and tripping.

Overall good design and usability of lighting, kitchen furniture and bathrooms were considered to improve access.

In terms of services, the key access issue is the knowledge of availability of different kinds of services.

When it comes to new technologies and digital solutions, usability issues seem to be a big concern for the older people.

Easy to use user interfaces are crucial when providing accessible services for older adults.

Outdoor access

When analysing the responses to the task "the Top 10 things that help my home age with me", a category brought up in almost all answers was outdoor access.
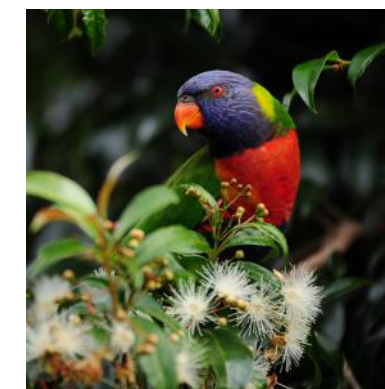
Many participants mentioned that they wanted to have access to a small garden, to trees, flowers and birds or to be able to view some nature and sky through their windows.

Respondents seem to reflect a lifestyle, where they spend a considerable time at home and still want to have an easy connection to outdoor life.

Most participants mentioning a garden, emphasised that it should be easy to maintain and quite small.

Social connection

Home needs to support contacts to family, friends, pets and carers.

This may require physical design solutions such as having large enough entertaining areas both inside and outside to host friends and family.

Many people brought up the importance of fast and reliable internet access to keep in touch with dearest ones.

One participant enjoyed telling of her delightful experience of moving to a new block, which was designed for a great communal experience and activity.

Many participants thought they would value the village community spirit.

This again is an urban design challenge: how to plan housing to support social life and create a sense of a community.

Key fact

Loneliness is a comparable health-risk factor to smoking 15 cigarettes a day. (6)

Opportunities and next steps

Ageing in place in smart homes is a big and growing global trend.

The McKinsey Global Institute has found that the 60+ population will generate half of all urban consumption growth between 2015 and 2030. (7)

As more than 90% of older adults would like to age in their homes, this means that ageing in place provides great opportunities for many businesses. LifeLab looks forward to working with companies and older people to come up with innovative new solutions to help people to live long and well in their homes.

Following the workshop session at LifeLab there are a number of potential opportunities and next steps for consideration by companies, citizens, researchers and policymakers.

These include future co-design projects to explore in more detail the contextual needs and wants of older residents related to ageing in place, as well as further exploration of possible business models, product ranges, channels to market and ways of providing citizens with information and advice to support choice and decision making.

Suggestions for design

The focus of the workshop was to understand the contextual needs and wants of people, not to produce product or service design guidelines. However, based on the vivid interaction and material produced in the workshop, the following rules of thumb could be derived to guide product and service designers to the age in place market:

1	Homes are very personal places full of history. Respect it! All design for home should be non-intrusive
2	Remember privacy in all services.
3	Know your target market! Older people are very different, they are not just one segment. Universally good design fits all – but most product or service concepts do not.
4	Small physical modifications make big differences for ergonomics and usability.
5	Home is a hub for social connections – design for meaningful social interaction.
6	Services and access to them get more important as people age.
7	People want to be in control. Everyone wants to understand what new technologies do in their homes -and how to use them. This is a service design and learning challenge.
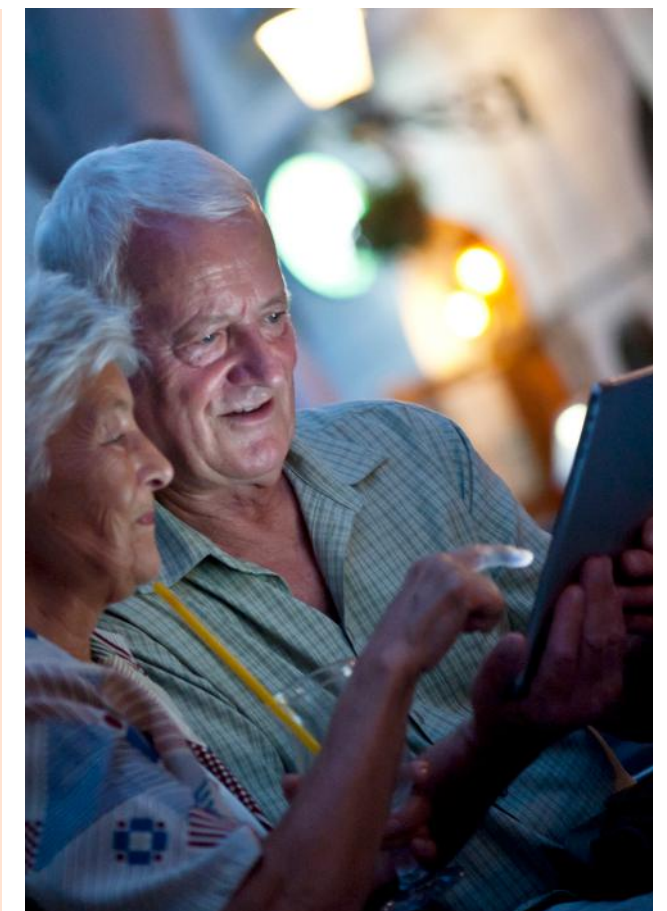
Support for business

One of GCMA's vision is to create an ecosystem that empowers people, businesses, researchers and governments to seek and develop solutions that reflect the opportunities of modern ageing.

To this end, the Centre is establishing a Modern Ageing Alliance – a network of companies, agencies and other organisations that are part of, or want to be part of, the emerging ageing well market.

The Centre will play an enabling role by connecting different players in the ecosystem through networking opportunities, projects and by delivering insights about the scale and scope of the opportunities in the market.

Support for citizens

A key insight from the workshop was that while there is a plethora of services and support available, navigation of these is complex and not generally well understood.

A problem identified was where to go to find the right advice to inform the choices being made (or needed in the future) about how to live safely, securely and happily at home.

In line with its advocacy role and its commitment to put older people at the centre of everything it does, the GCMA has identified a number of "starting points" to assist older people find information and advice from trusted sources.
The **My Aged Care** website of the Commonwealth Government is a one-stop-shop for information and the gateway to services relating to support for living at home as well as entering residential care.
https://www.myagedcare.gov.au/

The Seniors Information Service (Catalyst Foundation) is a great place to start when trying to locate services and support:
http://www.catalystfoundation.com.au/

There are lots of useful resources on the **COTA** (Council on the Ageing) web site:
https://www.cotasa.org.au/

See the **Office for the Ageing** site (including the Seniors Card directory):
https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/department+of+health/office+-for+the+ageing

https://www.sa.gov.au/topics/family-and-community/seniors/seniors-card

REFERENCES

1) *A Report to the Nation on Livable Communities,* Andrew Kochera et al, AARP

2) *Smart Home Market...: Global Industry Perspective, Comprehensive Analysis and Forecast, 2016-2022,* Zion Market Research

3) *Sixth Report on the Funding and Financing of the Aged Care Sector July 2018,* Aged Care Financing Authority, Australian Government.

4) *6537.0 - Government Benefits, Taxes and Household Income, Australia, 2015-16,* Australian Bureau of Statistics, 20/06/2018.

5) *The Real Cost of Retirement, August 2018,* Wade Matterson, Milliman

6) *Social Relationships and Mortality Risk: A Meta-analytic Review. Julianne* Holt-Lunstad et al (2010), PLOS Medicine

7) *Urban World: The Global Consumers to Watch, April 2016,* Richard Dobbs et al, McKinsey Global Institute

General references

• *Housing for Life: Designed for Living* Office for the Ageing 2017

• *Global age-friendly cities: a guide* World Health Organization 2007

• *South Australia's Communities for All: Our Age-friendly Future*

• *Age-friendly South Australia: Guidelines for State Government* SA Health 2012

• *Neighbourhoods of the future - Better homes for older adults - improving health, care, design and technology* Agile Ageing Alliance 2017

Discussion 1: How might your home age with you?

The results of the two groups have been presented separately because the discussions followed very different pathways. The full data from each discussion is presented in Tables 1 and 2. The data has been organised by the themes identified during the discussion, and aligned with the domains of age-friendly cities developed by the World Health Organisation (World Health Organisation 2007). A frequency analysis of this data has been undertaken, demonstrating the most frequently used terms by Group A were: access, social, connections, friendly, interaction, kitchen, live, and needs (Figure 1), and those used by Group B were: services, needs, products, house, and support (Figure 2).

Table 1: Results from Discussion 1

Theme (WHO Domain)	Comment
Accessible elements (Housing)	Rotating drawers for easier access
	My oven is below stovetop. Baked food is too heavy and difficult to get out of the oven - I should have chosen a wall oven
	Easy access to cupboards (not too high or too low) and drawers, especially in the kitchen
	Clothes hanging rails adjustable for easy access as reach up changes
	Accessible storage
	Kitchen: we renovated our kitchen. Positive: corner cupboards rotate like a lazy susan. Negative: cupboards are too high. I have to stand on a step or step ladder which is dangerous
Getting help (Housing)	Advice service
	I wish I had an aged needs counselor to give me advice when designing my new kitchen
Environmental control & connection with the outdoors (Housing)	Increased environmental interaction - roof windows / sky / garden
	Adaptive lighting - windows / floor guides
	Adjustable heating / cooling for each room of a house + "friendly" technology
	Noise insulation
	No common walls
Modularity (Housing)	Modular homes that grow / adapt / change
	Flexible structures needing little modification
	Use of modules when building houses / homes. Add + subtract rooms etc. See for example backenders in the 1940s.
	Some things can be retrofitted to existing homes to better serve the occupants. Other things are best done at initial building time in anticipation of future needs.

Table 1 (continued)

Theme (WHO Domain)	Comment
Security and safety (Housing)	Easy cleaning
	Home security
	Home security: access for friends / relatives. Access for emergency service. Restrict strangers.
	Security: access for some, not for others.
	Bathroom - emergency release hinges
	Live in a safe community
Physical access in the home (Housing)	Single level. If double storey - straight wide stairs - available for fitting lifts.
	No sharp edges
	Access to upstairs (lifts etc.)
	Non-slip floors for all non carpeted areas (inside and outside the house)
	Non-slip throughout.
	Natural lighting for mood.
	Bathroom - big enough for shower chair etc. Small _ _ _ for foot.
	Height of cupboards working benches.
	Preferably no steps.
	Doorways and passages wide enough for walkers, wheelchairs. Turnaround space.
	Built-in rather than retrofit
	Social interaction, family friends.
Products (Housing)	Assistance around the home - i.e. robotic helper + company + siri on steroids
	Need solutions to assist daily tasks including gardening

Theme (WHO Domain)	Comment
Spaces (Housing)	Current house doesn't fit with future needs
	Designing housing to be retrofitable
	Door locks (barrel) sticking out are dangerous
	Recognising change - single storey, close to transport, garage etc.
	Removing hazards
	Stairs – a need for a less expensive way of installing lifts
	Stairs can be a gymnasium
	Tripping hazards e.g. bed legs
Recreation opportunities (Outdoor spaces & Buildings)	Neighborhood - close - recreation and social interaction
Help maintain physical activity (Outdoor spaces & Buildings)	Video conference personal training sessions for the home. Or an app that acts as a personal trainer
	More open space - less walking hazards
	Houses to encourage physical activity
	Exercise friendly to encourage physical activity
Spaces (Outdoor Spaces & Buildings)	The role of public spaces
Health (Community Support & Health Services)	Regular check-ins for social health / needs. Through phone, video chat, or text messages
	Appointment reminders - doctors / taxis / shopping
	Medication dispensing - day of week / date / reminder
	Health integration
Products (Community support & health services)	Equipment to support / develop core strength
Connection to services and transport (Transportation)	Live near services
	Live in my community, but the house may not be suitable
	Transport (sometimes too close or too far to be able to access transport options)
Products (Transportation)	Products to consider differing levels of mobility

Table 1 (continued)

Table 1 (continued)

Theme (WHO Domain)	Comment
Services (Social participation)	Don't have physical needs, but require services and advice - particularly support to keep up with technology
	Education / enabling services - note: services are difficult to standardise
	No one size fits all
	Services e.g. AGL/ Telstra haven't caught up with servicing needs (relate to individual needs)
	Services need to be considerate of the needs of different demographics
Community (Social participation)	Social / community connection to enable sharing of tasks / support
Facilitate social connections + privacy (Social participation / Respect & social inclusion)	Privacy
	Inbuilt technology to maintain social links
	Living alone - how to overcome isolation, improve connections
	Social connections
	Social interactions
	Remove connections with family - improve
	Social connections: we downsized into a cluster of 9 home-units arranged like an 'E'. This means we connect daily with other unit owners with greatly increased social contact + friendship.
Accessibility and equity (Respect & Social Inclusion)	Accessibility / equity / value for money
	Cost of housing
Readability (Communication / information)	Written products to be in larger print (e.g. hair shampoo / conditioner or cleaning products etc.)

Table 1 (continued)

Theme (WHO Domain)	Comment
Information (Communication & Information)	Access to knowledge about what products are available
	Dealing with too much choice
	Education for how to use new support products and services
	Information about products and services that can be trusted
	Information on how to retrofit a house to suit next 20 years (DIY)
	Products to assist in daily tasks (Lots of products on the market, but how to source)
	Stages / ages to plan for the future
	System of coordination with communication and coordination
	Trustworthy information on how to modify house, access support services

Discussion 2: How might what you have seen link with your table themes?

The second discussion asked participants to reflect on what they had heard during discussions with company representatives as a part of the 'marketplace' activity, and to reflect on a series of videos that they were presented with. During this discussion, participants were asked to consider what they had heard and seen in the context of the themes that had emerged during the first discussion. The results from this discussion covered a range of issues and focused on a new set of more specific themes. The results from these discussions are presented in Table 2.

Table 2: Issues raised during discussion 2

Theme	Positives
Interface	Consistency in look & feel of interfaces
	There is still a place for newspapers
	One device (probably phone) can do everything
	User-friendly language
Connection	Connected to care givers / getting help on demand not a scheduled time
	New levels of connection
	Connection with family through technology
Navigation	Personalised navigation
	Navigation features - useful
Design and technology	The Bots were adapting to the person's existing environment
	Environment + humanity + technology
	Stairlift resell. Robot helper - fall / hurt. LEQ - Israel
	"Future homes" less focused on retrofitting
Access	Cost of IT coming down
Other	I never thought of that
	That is cool

Theme	Concerns
Reliability	Breakdown of technology - reliance
	Reliability
	Ongoing costs + support
Access	Affordability
	Being confident enough to use technology
Connection	Is there too much reliance on technology. Diluting humanity
	Digital v.s. physical relationships
Privacy	Everything we do is recorded. Loss of privacy
	Can we be alone?
Design and technology	The IT was really visible when it should be invisible
	Us fitting technology not technology fitting us
	How can I use these things in my life?

Table 2 (continued)

Interface	Always being on !?!
	Smarter but is it harder?
	Do I need this much information?
	Information overload - need to simplify tasks

Further Questions to consider
Should the computer really be my closest friend?
Do you want to argue with your home?
What will become easier if I use these things?
Will we still interact with people?
How convenient to have this access?

Other Comments
For older people tech presented too far in the future
Technology rate of development - obsolete before its on the market
Changing use of technology - acceptance – development & understanding

Group discussion: What makes your house a home?

After a significant focus on technology and on future visions, the facilitators presented a simple question to remind participants that the goal of the workshop was to explore how a home, rather than a house, might age with its occupants. To do this, a the group were asked to describe what made their own houses a home. The results from this discussion are presented in Table 3, and highlight the importance of both tangible and intangible elements in creating and maintaining a home. Of the 22 recorded responses, more than half related to personal interactions, customisability and memories. Interestingly, only one response related direcetly to technology, and this response was from one of the younger company representatives.

Table 3: Responses to "what makes your house a home?"

Categorisation	Comment
Familiarity and personalisation	Comfort from familiar environment
	It works for you
	A place of comfort and respite
	Customise services in home to suit your needs
	More than a place to sleep
People or company	The people living there
	People
	Dog / pets
	Sharing what you have with loved ones
Memories	Photos of people
	Personal belongings or mementos
	It's not about stuff
Connections	Location / proximity to transport and other services
	Being connected to the community (wider than the people next door)
	Communication and connections to others / information
Security and privacy	Security
	Privacy to do what you do
Independence	Music of your choice / tv of your choice
	Convenience to set your own agenda
Affordability	Having a home makes a "home"
Nature	Plants (a garden if possible)
Technology	Fast internet

Activity: Top 10 things to help my home age with me

The final activity was to create a list of the most important elements to help a home age with its occupants. This activity specifically addresses the 'housing' dimension of the WHO age friendly cities framework. The activity was completed individually and participants were free to list as many or as few elements as they wished on a worksheet that was provided. Participants were asked to provide a description of a 'what', as well as a description of 'why'. A frequency analysis was again undertaken showing the most commonly used terms in responding to this exercise were: access, light, easy, safety, good, room, safe, and keep (Figure 3). Responses from citizen participants are presented in Table 4, and from industry participants in Table 5.

Table 4: Responses gathered from citizen participants to "the top things to help my home age with me"

	What?	Why?
Accessibility and safety	Sliding doors	Easier access (not in the way)
	Micro switch for doors	Safety
	Revolving drawers	Easier access
	Hand rails	Support
	Keypad for front door	
	Limit furniture	Easier to walk around
	No high cupboards	Don't want to use steps
	No low cupboards unless they have pull out drawers	Bad leg
	No steps. Ramps where necessary with rails	Increasing risk of falls
	Built-in cupboards and stable, solid portable furniture	To prevent tripping
	Waist high dishwasher similar to oven height	To prevent bending
	Sensor floor flights leading to bathroom	Prevent confusion in dark at night
	Safety features on all gas and electricity fittings and appliances	To avoid risk
	Security on door and windows	To feel safe
	No steps / ramps provided that don't impinge on space	Avoid obstacles and prevent falls / serious injuries
	Easy access to all drawers + cupboards	To avoid squatting down / stretching high / using a ladder so that you're not hampered by physical liveability or risking having a fall or being injured
	Rails in wet areas, passageways etc.	To support movement, feelings of security, prevent falls/injuries
	Bathroom with anti-slip flooring, taps easy to turn on and off, ventilation of steam etc. and good lighting	Safety of persons using the room
	Easily managed security	For personal + property safety

Table 4 (continued)

	What?	Why?
Accessibility and Safety	Easy access storage	Don't have to bend down or use steps to access cupboards
	No sharp projections, corners	Avoid personal injury
	Temperature controlled hot water	Avoid accidental scolding
	Non-slip surfaces for all non-carpeted areas	To prevent slips and falls/serious injuries
	Grandchildren proof	Safe for when small children visit
	Facilities & space for disabled people	Accommodate wheel chair, walking frame, commode
	Toilets - a toilet in the bathroom with access to water as close as possible to bedroom. A second toilet available too.	To clean up accidents + hygiene
	Level floors	Sore knees, hips, tripping + disabled facilities
	Rails and solid bathroom fixtures to take body weight	Reducing strength and mobility
	Electronic armchair	Help stand upright
	Sensor controlled oven/cook-top	Greater safety
	Sensor dimmer lights	Night safety (on/off switch)
	Lever door handles	Easier to use
	All cooking + heat appliances at bench height	Safety and access
	All doors, passageways wide	For wheelchair access
	No steps, good lighting	Easy good access entering + leaving house
	Ample storage at right level	
	Good natural and artificial light	Sight not as good as could be. See where you are going. See hazards
	Bed at good height	Easy to get in and out
	Shower you can sit under	Shower in chair if needed
	Feel safe from items that might cause injury	Injury might impede future activities
	Voice activated environment e.g. lights, air-con, entertainment	Assist with mobility impairment

Table 4 (continued)

	What?	Why?
Accessibility and Safety	Convenient utilities e.g. toilet, cook-tops, showers + sitting areas	
	Light, movable furniture & appliances. E.g. deep fryer, coffee machine	
	A home + furniture that does not have sharp objects that could cause damage	
	A house locking / security system (leave and forget)	No more worries about locking all the doors
	A monitoring web system that projects hidden/ unseen parts of the house + surrounds	
	Safe / non-slip walk surfaces	Safety
	Handles in the bathroom	To aid with mobility later on
	All drawers in kitchen	To save getting to back of cupboards
	Remote controlled / touch appliances	Ease of use
	Sensor lighting in hallway	
	Levers on taps	Arthritis later on
	Spacious safe bathroom facility	Safe area where I can care for myself with safety
	Easy reach cupboards + work spaces. Easy to use and to keep clean - kitchen & other appliances/ facilities.	Ease of everyday routines.
	Secure safe access to power for functioning of house, communications	
	Lighting (both natural and motion-sensor lights for entries, passages, and work areas)	
	Wide spacious doorways and passages for future easy navigation with walkers, wheelchairs etc.	
	Security / safety of house - to keep out 'undesirables' and allow access to family & 'necessary' people, e.g. emergency	

Table 4 (continued)

	What?	Why?
Social interactions \ companionship	Host family / friends	Connecting, companionship, independence
	Social interaction made possible	It's an essential human need
	Pets	Companionship, familiarity, security, reason to care
	Connecting with community	Friendships, belonging, staying in touch
	Reliable fast internet access	To keep in touch with interstate and overseas friends and relatives
	Sited in a community of people who can choose to interact, socialise, respect support one another or be private	Humans need a village to live in
	Entertaining area	Be able to entertain a large group of friends and family inside and outside
	Where I am close to family and friends. I.e. have technology that enables me to be in contact and be physically near to a few members of the family	
	Good internet and technology	To keep me in touch
	Good parking in the street	For family and friends who are visiting
	Digital screen	Family interaction, recipes, shopping list
	Large, quality "TV" screen	Watching TV, sports video. Talking to children / friends
	Video wall to keep in contact with family out of Adelaide or with close friends	Social interconnection and interaction. Ability to connect with friends and community, even when person is too old to travel out.

Table 4 (continued)

	What?	Why?
Physical and mental wellbeing, personal comfort	Skylights to let in light where there are no windows	To lift feeling of wellbeing
	Provision for encouragement of physical exercise with equipment suitable for ease of use by over 60s	To support health and wellbeing, physically and mentally
	Automatic heating and cooling	To keep comfortable
	Sun light for light naturally inside house + plants, inside and outsid	Provide oxygen, for aesthetics
	Temperature controls adjustable for each room	Different tastes for different people. Living in fewer rooms as we age.
	Study/den with comfortable chair, desk, climate control + adequate room	To allow me to pursue my hobbies at my leisure without keeping it "tidy"
	Lounge room with climate control	This is the "go-to" room for year round comfort and relaxation
	Lounge room with outdoor views	This is the "go-to" room for feeling of not being "confined"
	Insulation against noise and temperature variations	Comfort
	Light sensitive windows	Become opaque at night
	Bigger windows	Increased outside view
	Garden: Small, easy to manage	Access to nature - birds, trees, flowers
	Good climate control: insulation / heating / cooling that is safe + easy to use	Comfortable living when it is too hot/cold
	Access to sun and sky	Dry washing outdoors, sat in sun to get vitamin D, north facing windows for winter sun, natural light through windows
	Stairs	Maintain physical activity
	A cosy nook (where I can sit & do what I want) that is light, and airy where I can have quiet or otherwise	Where I can be myself or have company if I want. Emotional / psychological health
	Environment control - temperature, ventilation, noise/sound	

Table 4 (continued)

	What?	Why?
Independence	A garden, beautiful and low maintenance	Access to nature
	Cook own meals	Choice, safety, ingredients
	Self-care	Independence, health, fitness
	Security	Independence, safety, risk
	Low maintenance garden	Easier to maintain
	Clearer, larger text on products and manuals	Failing eyesight
	Fully irrigated garden	To make tasks easier
	Sensible landscaping of manageable plants	To avoid continual pruning maintenance
	Print large enough to be clearly read	For ease of deciphering information / saying safe / carrying out instructions
	User friendly technology	For ease of use, less stress
	Reduce garden	Too labor intensive
Hobbies & interests	Need room to participate in interests and hobbies e.g. art, craft, minerals	We need a dedicated area where interests + hobbies can be accommodated withou packing up at the end of each session
	Storage - plenty of it and easy to access it	
	Area where I can have plants / pets / hobbies / recreation	For my psychological health

Table 4 (continued)

	What?	Why?
Assistance (Human and/or technological)	Have a cleaner on a regular basis	
	Uber eats	Convenience
	Regular maintenance	Stop major repairs in the future
	A one stop shop (person or electronic) to mentor me on maximising my home's functioning	Ultimately this would save me and taxpayers a lot of money if I'm able to keep and my home safe and in good shape
	A centralised service to provide advice	To pool together resources available
	Support for technology as it evolves	I need education and support with choosing technology, installing it, setting it up, operating it, troubleshooting, and upgrading it.
	Maintenance	In our group of units we cooperatively get outside maintenance and gardening done. This is helpful as we age and body corporate managers can do this. We are not in a retirement village.
	Low maintenance surfaces	Help the cleaner be more efficient
	PC, iPad and TV able to enable me to keep me and my home functioning well	Without these my home and I become increasingly isolated and this is unproductive and dangerous
Other	De-clutter junk	Free up my mind
	Rooms suited to purpose and sufficient. E.g. as well as bedroom to sleep in - an office, guest room	Accommodate lifestyle

Table 5: Responses gathered from industry participants to "the top things to help my home age with me"

	What?	Why?
Accessibility and safety	Rails	Assist getting up and down into bath and toilets
	Open plan where possible	Easier access
	Higher power points	Easier access
	Less nooks and crannies	Smaller areas are less accessible
	Non-slip flooring	To not slip
	Floor covering non-slip but easy to clean	Safety, convenience
	Bathroom large enough + equipped for mobility devices & carers	
	Non-slip shower with better access	Reduce risk of falling
Social interactions \ companionship	Study/spare bedroom for visitors	
	Information wall Voice operated video conference capabilities	Stay connected and up-to-date. Contact medical and other services
	Access to friends + family	
	Spare rooms for visitors	Good to have company
	Space for pet	Companionship
Independence	Easy planter boxes and irrigation	To customise garden without too much work & grow own food
	Intelligent services + budget	Money is key influencer of services

Table 5 (Continued)

	What?	Why?
Technological assistance	Constant health monitoring + alerts if failure	Reduce dependence on others and improve chance of recovery if health problem occurs
	Garbage + recycling that takes its self out	Lifting, reminding me to do it
	Monitoring of food supplies + automated delivery	Make sure there is good (in date) food, no repeat trips
	Cleaning assist tech	Maintain clean + healthy home
Physical and mental wellbeing, personal comfort	Sound + light proof	Better sleeping
	Not cluttered	Happy, comfortable environment
	Place to cook + eat that is connected to outside	Peace, space, fresh air
	Lounge connected to eating + outside spaces, furniture comfortable and assistive but not looking like its for older people	Comfort
	Bigger windows	
	Wine cellar	It gets better with age
	Lighting	Changes with age + mood
	Health + fitness technology	To keep mind, body _ _ _ _
	Food sciences	Need to be smarter with food
	An environment I know + feel comfortable in	Changing home at older age is stressful
	Temperature monitoring + sustainable heating / cooling	Comfortable home within budget
	Carpet that doesn't collect dust and dirt	Stop allergies. Hard to vacuum.

	What?	Why?
Product	Ergonomic chair/furniture	Sitting in front of computer often
	Amazon smart fridge	Simplicity of use
	Digital interactive portals	Centre point for watching anything on computer etc.
	Control access panels	Use functions of house from anywhere
Construction	Flexibility of room configurations	
	If a new build, engineer house to enable retrofit of assistive devices	
	If a new build, choose fittings and fixtures that are age friendly	
	Ceiling structure that will accommodate mobility / lifting devices	I, or others that may buy my house can retrofit
	Modular design	Can adapt to needs
Other	Resources	Want to live with less
	Minimalist solutions	Need less of everything
	Memories	I'm after all human

About the Global Centre for Modern Ageing

Empowering people and business

The Global Centre for Modern Ageing was established in 2018 to take Australia to the forefront of modern ageing in Australia and the world.

The newly formed Centre and its associated LifeLab @ Tonsley are an extension of South Australia's strategic Ageing Well initiatives over recent years.

LifeLab is a world class facility and the only one of its kind in the Southern Hemisphere providing enterprise driven living lab services to support the ageing well market.

We have a highly qualified team with significant experience in managing living lab projects together with large research projects. We have a focus on intergenerational projects and we are not aligned with any individual university. While we value academic input and insight, we also value agility. We bring the rigour of academic research to commercial projects meeting the needs and deadlines of the clients who engage us. We provide mechanisms via our living lab methods and research for companies to bring their products to mar-

ket faster and with better market fit than other traditional avenues. We engage the right target users to validate product and service ideas and prototypes.

Vision

By 2021 Australia will be recognised as a world leader of modern ageing.

The GCMA will create an ecosystem that empowers people, businesses, researchers and governments to seek and develop solutions that reflect the opportunities for modern ageing. We will explore and validate in real life settings the potential of new solutions with real users.

We will provide better products and services that enable older people to live and age well in Australia and around the world.

About LifeLab

Accelerate development path

LifeLab plays a key role in accelerating the process of bringing products and services, targeted to the needs of older people, to market.

LifeLab brings together older people, businesses, organisations and researchers to co-design and validate products, services and experiences, that will better serve the lives of ageing people in Australia and around the world. LifeLab accelerates its clients' product development by providing high quality user-centred co-design and research services.

This process ensures real-life market demand and users' insights are incorporated into the product development process.

To do so, LifeLab offers different kinds of living lab services to companies. In each project, end users are an essential part of the process.

LifeLab projects can be conducted at all stages of the product development cycle.

LifeLab provides proven mixed methods to best suit the client's needs, adapted to the needs of the project. For instance, at the beginning of the process contextual inquiry may add value, whereas towards the end, validating solutions in real life trials may facilitate market entry.

LifeLab offers ethnographic studies in real life settings to ensure the product design best reflects user behaviour and meets their needs.

LifeLab @ Tonsley is designed to accommodate a number of simulated environments and incorporates sophisticated video and audio data recording systems to capture in detail user interactions with innovative products, services and solutions. The space can be configured to simulate multiple domestic and office environments, and features a fully functional kitchen with operational gas and electric appliances.

LifeLab @Tonsley is designed to capture and

LifeLab Executive Director Veera Mustonen

analyse user behaviour in relation to emerging products and services.

LifeLab offers a diverse suite of services to businesses and broader networks, including:
• Management of LifeLab engagement processes to drive product and service design outcomes;
• A flexible approach to validate product and service design;
• Methodological expertise for co-design and co-creation, user research, user interaction and real life studies
• Data analysis and report writing.

In its work, LifeLab maintains the highest quality: being open, respectful, and adhering to high standards of ethics, privacy and secure data storage.

Target market segments include but are not restricted to food, packaging, assistive devices, technology, active living, education and lifelong learning.

LifeLab is a wholly owned division of the Global Centre for Modern Ageing.

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