NEIGHBOURHOODS OF THE FUTURE

BETTER HOMES FOR OLDER ADULTS – IMPROVING HEALTH, CARE, DESIGN AND TECHNOLOGY

A WHITE PAPER FROM THE AGILE AGEING ALLIANCE, A CAMPAIGNING SOCIAL BUSINESS CONNECTING DIGITAL INNOVATORS IN AN AGEING SOCIETY
McCarthy & Stone’s CEO, Clive Fenton, explains why it is vital for housebuilders, housing managers and their ecosystem of suppliers to embrace innovation and ensure that the housing needs of the next generation of older adults are met.

2017 will see McCarthy & Stone turn 40. The concept of retirement has changed dramatically since we built our first development in 1977. In many ways, it no longer applies.

People live longer, work longer, travel more, and expect more. But while most of the change has been positive, certain aspects have declined. Every day we read or hear about older people struggling at home, the poor quality of social care and health services, and rising levels of loneliness affecting health and well-being.

In 1977, when we built our first retirement development, there were around eight million people aged 65 and over in the UK. Today, there are 11 million. In 2035, there will be 17 million, so the numbers will have more than doubled over this period. This pace of demographic change means there is an increasing need for better products and services for this growing segment of our population.

The move into the information age has been the other major change in our society. New forms of technology and ‘big data’ present possibilities for everyone, especially older adults. However, their impact on those in later life is relatively unexplored. This is of great interest to us, particularly how they can support this age group to live better at home.

We have therefore commissioned this report in partnership with the Agile Ageing Alliance, under the technical authorship of Professor Merlin Stone. Its purpose is to review what role technology can play in supporting independent living, providing entertainment and education, while keeping families and friends connected.

It is our view that technology will never replace the human touch and we are sure that developments in robotics will not compensate the need for personal care delivered by humans, but we would like to understand how tech can improve health and well-being and Indeed, what is the relationship between health, older people and technology, and how can they support each other and co-exist?

Much of the UK’s retirement housing built over the past four decades reflects the way we, as market leader, have defined the sector. As part of our anniversary celebrations, we’d like to know what the next 40 years has in store for our market, and that’s where this report comes in.

Much like the ‘concept car of the future’, exploring the potential of emerging technologies to enhance our homes and support independent living will help us to continue to innovate and deliver state-of-the-art homes in our smarter neighbourhoods of the future.

We expect this report to influence our thinking, and the thinking of other housing providers. Our aim has been to summarise in one place, perhaps for the first time, what technology is on the horizon and consider how it could empower older adults and improve their quality of life. We would like this report to serve as a valuable resource for all housing providers. To use an appropriate technological term, we want it to be ‘open source’ – for the benefit of everyone – and ultimately to facilitate the creation of new homes that will support happier, healthier and, hopefully, longer lives.

CLIVE FENTON
CEO McCarthy & Stone
What this report explores

Neighbourhoods of the Future examines the so-called housing ‘crisis’ facing the next generation of older adults. It suggests that although there is most definitely an urgent need for more ‘age-friendly’ housing and built environments, innovative new product and service solutions enabled by evolving technologies such as the Internet of Things and 5G provide a golden opportunity to rethink the outlook for ageing populations, particularly if various sectors, organisations and stakeholders adopt new collaborative business models and work towards a common and mutually beneficial reference framework for age-friendly housing.

This report is based on the outcomes of a 12-month pan-European roadshow in which we have listened to the needs, achievements and plans of the public sector, together with hundreds of inspirational businesses, NGOs and institutions. It is also informed by interviews with some of the leading commercial and academic players, an extensive literature review and our own experimental research comparing the needs of current older adults with those of the next generation.

This next generation, often called the baby boomers, is not only the largest generation of older adults the UK has ever seen, but also the most educated, financially secure, technologically aware and experienced. It is a generation accustomed to the service economy, not just as customers, but also as suppliers. Many will still be working in the service industry, possibly from home, being semi-retired, and many will also be running their own small businesses from the comfort of their own homes.

For the most part they recognise they are on a journey, a mental and physical journey of possibly declining health and increasing time to savour life. Many believe that mental and physical fitness, creative pursuits (play), companionship and a balanced diet are key to what we call ‘agile ageing’, frequently aligned with longer (often part-time) employment. Whether they are as fit as a proverbial fiddle, frail, or disabled, they need facilities and incentives that support healthy and active ageing, but they do not want ugly, cumbersome devices imposed on them.

They expect transparency in relationships and information. They look out for value for money. They also want suppliers who think about consumers’ service experience and the journeys they go on. They love people competing for their business and do not like monopoly suppliers.

FLEXIBILITY IS ESSENTIAL

Homes may also increasingly become intergenerational living spaces. While we live in a society where independent living is prized, co-living may become more common, with younger couples needing affordable housing and older generations nearby to offer and receive support as required. Good inclusive design and technology can help to create modern, flexible spaces that can be adapted in the event that adult children need to care for frail parents.

People power

The technological innovations featured in this report could have transformative benefits for older adults. However, like health care, where health literacy is a huge challenge, we need to do more to engage the widest possible audience in this debate in order to avoid the possibility of a two-tier society: those who are tech-savvy, and those who are left behind.

And let’s not get too carried away with the idea of technology as the be-all and end-all. The vast majority of stakeholders we spoke with were keen to point out that digital innovation can enable, improve, support, augment and empower – but not replace – human communication and relationships. Taken together, the innovation elements outlined in this report can be truly transformative.

Agents of change

So, this report is a rallying cry – a brilliant opportunity to tap into the experience and thinking of a generation of receptive older adults who are willing and able to serve as agents of change. They are READY FOR SOMETHING DIFFERENT. Some have already started, smartening their homes, taking control of their relationship with health services and the medical profession, and perhaps with social care, as many have older relatives or friends they are helping or caring for.

In summary. If housing providers are willing to listen to prospective customers, we can look forward to the growth of a new breed of smarter homes in our Neighbourhoods of the Future. Enabling our older selves to enjoy more meaningful, healthy and creative lives, living in fit-for-purpose environments which will in turn facilitate life-affirming opportunities for personal development and social engagement.
How stakeholders are willing to collaborate in a united effort to reimagine how we house the current and next generations of older adults.

While the UK is in the process of leaving the EU, it would be counterproductive not to work together with our European neighbours on big societal challenges. This is not just because we share a culture and the challenge of an ageing population, but also because our links with Europe go far beyond legal frameworks. They are based on friendship, a shared culture, ideas, ideals and history. Furthermore, Europe, much as the rest of the world, is going through a digital revolution.

Digital innovation can support some of the major challenges ahead in ensuring that older adults as well as the wider population remain independent and active in society, receiving coordinated care and enjoying longer in their homes, particularly in remote and rural areas, while increasing the efficiency of health and social care systems.

Co-creative ICT-based design and development approaches will allow key supply sectors such as the construction and tech industries to work more effectively with institutional and private clients to integrate smart home and IoT technologies into safe, supportive living environments for all.

In December 2016 at the second European Summit on Digital Innovation for Active and Healthy Ageing, European Commissioner Günther Oettinger (Digital Economy and Society) delivered the first phase of a Blueprint which aims to demonstrate how digital innovation can transform demographic change into an opportunity for Europe’s economy and society.

Recognising that a shared vision is essential to mobilise investment and guarantee the commitment of all actors, the blueprint is a collaborative process involving a broad spectrum of stakeholders including the European Innovation Partnership for Active and Healthy Ageing, reference sites, industry, standards organisations, and user organisations; underpinned by a €4 billion commitment from the public sector to invest in health and care innovation in the next three years across Europe.

The Commission envisages that this vision will be developed through a unique, open, collaborative and dynamic set of resources and tools, co-created with a number of “champions” including organisations such as the Agile Ageing Alliance.

The quality of life for all citizens, but especially for the growing number of older citizens and those living with chronic conditions, is determined mainly by how far the physical and social environment of their daily lives supports autonomy, independent living, social connectivity and meaningful social participation. Improving this environment requires authorities at all levels to move from traditional, ‘siloed’, top-down approaches to policy development and service provision to facilitative and distributed models that allow self-organisation and empowerment of citizens to drive social transformation.

That said, innovation is not exclusively about new technologies. Digital innovation can enable, improve, support, augment and empower – but not replace – human communication and relationships. Taken together, the innovation elements outlined in this report can become game-changers that transform our lives and how we provide or receive health, care and social services.
In this section Professor Merlin Stone explains how he was lured from retirement to consider how digital technologies can help us to live better at home.

Except when it comes to older adults that is. We are a poorly served demographic. Rich with disposable income and a wealth of knowledge yet, more often than not (and especially when it comes to marketing), we are treated as second class citizens. Research for the Financial Times by Silversurfers website bears this out, with 82% of retirees saying they felt businesses and brands did not understand their lifestyle and 69% believing advertising aimed at the elderly was patronising.

In truth, there’s a whole new phase of life up for grabs which is poorly catered for. The move to the information age, with seemingly never ending new technologies and ‘big data’, presents possibilities for everyone, particularly older adults. But their impact on those in later life has been relatively unexplored. This is what interests us most, particularly how these possibilities can support my age group to live better at home.

According to the European Commission over 70% of Europe’s housing stock is not fit for purpose. In the UK the average home is older, smaller, more overcrowded and less modernised than in most of the other advanced European countries. With a rapidly ageing population, this is frightening, and it prompted me to respond favourably when a former IBM Innovation partner Ian Spero invited me to join the Agile Ageing Alliance, with a view to taking a fresh look at how smarter homes and environments can enable an ageing population to live healthier, more meaningful, agile lives, for as long as they are physically able.

However, a word of warning – it would be counterproductive to rush into detailed insight based on the current 70+ generation. Even seeking the opinions of those of us with elderly relatives is unreliable, because our relatives did not grow up with Facebook, smart phones, live streaming or any of the other pervasive technologies that permeate our lives and which most of us now take for granted. That does not mean to say we should ignore the needs and desires of this older generation, but neither should we allow this to restrict our vision.

To this end, we have engaged and conducted research with a wide range of older adults and consumers, focusing on baby boomers – average age 60 – plus older adults with an average age of 80 – taking account of their views, potential needs and aspirations.

We also interviewed senior industry decision makers and thought leaders and carried out an extensive review of the literature produced by the myriad of academics, government and nongovernment organisations and private sector companies interested in our topic. The results of the research have been used to build the picture that follows.

AN ENLIGHTENED AGE

The first thing that struck me from my research was how disjointed this sector is. To have any chance of realising this vision, stakeholders will have to invest more time talking with each other, developing ideas together and testing and implementing the ideas together.

Now, with thanks to AAA partner McCarthy & Stone, we have been able to apply this thinking to our smarter Neighbourhoods of the Future. Our research aims to bring together the perspectives of the many stakeholders involved, using their insights as well as our own to connect the dots and inform the aforementioned Reference Framework for Age-friendly Housing; working in a spirit of open innovation, not of superior knowledge and expertise, which no-one can claim.

The outcomes we need will only be possible with strong input from pioneering social and technological entrepreneurs, who will complement the role of local and central government, not for profit and housing organisations, private developers and end users.

IT’S ME YOU’RE TALKING ABOUT

All this talk about digital health and innovation, smart technologies and homes – what does it mean to me as an ‘older adult’? There, I said it, I am the proverbial ‘senior citizen’. I may be 68, but I’m feeling 40 or thereabouts and like so many of my friends and peers, I’m enjoying life to the full.

Truth be told, I tried retiring a few years ago, but it drove me (and my dear wife) crazy, so here I am, doing what I love, helping explain complex concepts, products and services to encourage innovation. In fact, I have enjoyed working on this project so much that I have accepted a part-time project so much that I have accepted a part-time...
There is a growing demand for age-friendly housing, but where will the funding come from? Here we speak to experts in longevity, property, banking and architecture to understand the perception of the challenge, as well as the opportunity within this growing space.
In years to come assistive technology will touch most, if not every aspect of ageing at home. To mark the 40th anniversary of their first groundbreaking purpose-built development for older adults, our friends at McCarthy & Stone asked AAA to reimagine what a retirement home might look like in the next decade or two.

Following an international competition we selected Moive Ltd – a London based architectural, design and visualisation consultancy. The following images are based on an initial concept design for a future cognitive living cluster – made up of modular ‘plug and play’ units which take advantage of sound design principles and advances in pre-fabricated construction techniques and technology to create a barrier free environment which will support independent living.

Working in collaboration with the AAA, Dariusz Sadowski and Martin Pietrowski of Moive have been thinking about the relationship between architecture, design and technology, to empower and sustain older adults. According to project lead Dariusz Sadowski: "The idea is to integrate advanced building fabrics with a preinstalled technical membrane so that these advanced living clusters work seamlessly with their immediate and wider natural environment to minimize the impact that buildings have traditionally had on our natural resources. In addition to supporting home based health and care systems, advantage will be taken of ever more efficient renewable energy production, ultimately not only making the ‘cognitive living clusters’ independent from external energy supply requirements, but even being able to produce additional energy to feed into the grid".

Here we look at some of the innovations we may well find in our Cognitive Homes of the not too distant future:
TOMORROW’S WORLD

AAA Founder Member Tom Braekeleirs, Director Microsoft Innovation Centers Belgium, explains why he believes it is essential to give senior citizens a voice in designing new products and services.

When we think about an ageing population and our neighbourhoods of the future, there are a couple of perspectives that spring to mind. Let’s start with the essence – but one that is too easily forgotten – and that is the end-user him/her or herself. We hear, see, read so many opinions and proposals derived from the desks of people that are often not considered ‘the target group’. That is why it is so important to give senior citizens a voice in informing development of product and service concepts that are directed at them as potential users, even to the point they can test and make-or-break the proposed approach.

We must also pay more attention to the infrastructure side, taking account of the need to construct new homes and facilities, retrofitting older buildings and changing building codes, whilst implementing new IoT (Internet of Things) enabled technologies such as beacons, sensors, and domestic appliances and the related network infrastructure that seamlessly connects our homes with the world of advanced computing and telecommunications. It’s a world buzzing with acronyms, slang and hollow phrases, but... if we want to tackle this challenge at scale, we need to integrate the built environment with IT infrastructure, software, cloud solutions and so much more. That said, the sheer unlimited possibilities of technology combined with infrastructure will raise even more challenging questions. How will we protect the individual when every little step, every detail is measured, monitored and stored? Where is the balance between convenience, privacy and public good and service? These are just the legal aspects. We don’t even know for certain what we will have to put into these laws, because – let’s face it – no one has a crystal ball to read the future. But one thing is sure. The future is coming...

Imagine a future in which there are smart devices connecting themselves to other devices to exchange information. The future will focus on communication: human-to-machine, but even more machine-to-machine. It sounds scary with robots taking over the world. It will probably not be in that shape, rest assured. But it will become even more focused on devices becoming really smart, not being controlled by an app. The concept of an app is outdated as it is, with just being an interface to ’something’ in the backend. Technologies such as artificial intelligence, bots, computer vision and many more will unleash exciting new scenarios that we can’t even conceive of today. The speed of change is increasing, and even though it might seem far-fetched, 10 years is not that long. It’s amazing – and unpredictable – what the human mind is capable of. Or to quote Bill Gates: “We overestimate what we can do in a year, but underestimate what we can achieve in 10 years.”

...information systems will free us of many small burdens that today add stress and chip away at our mental focus. Our own neurological limits, which lead us to forgetfulness and oversights, will be supplemented by information systems designed to support our needs.

According to Maarten Ectors, VP of IoT at Canonical, through IoT and open source technology, our home appliances will become as adaptable to our needs as our mobiles have become. In the future, any manufacturer will be able to run their own interoperable app store which means appliances will no longer have just a single function. So, imagine being able to ask your fridge what is inside, and suggest recipes based on health plans recommended by your health care professional?

The IoT, says Ectors, will be huge: “Over the past decade we have seen how big names lost out because of disruptive technology changes and almost disappeared. Kodak suffered from digital photos. Nokia from smartphones. Blockbuster from video on demand. Microsoft Windows is now the number three operating system, where they used to dominate the PC market. IoT is another such technology disruption that will create winners and losers.”

“The best way to predict the future is to create it”

Some of the latest digital solutions are stunning, and there are many more to come, revolutionising how we design and interact with everything, including housing for older adults.

Let’s take a look at what’s going on across the sector and consider how these developments could affect our smarter homes and Neighbourhoods of the Future – a future where our homes become part of the family, growing with us, listening to us, knowing what we like and when we like it, remembering birthdays and helping us buy presents, ensuring we never run out of milk or forget a doctor’s appointment. It’s Home 4.0 – or will it be 5.0? Or, indeed our preference: The Cognitive Home.

Looking as far ahead as 2033, Google chairman Eric Schmidt and Jigsaw (previously Google Ideas) chairman Jared Cohen wrote in their recent book The New Digital Age: Reshaping the Future of People, Nations and Business that: “...information systems will free us of many small burdens that today add stress and chip away at our mental focus. Our own neurological limits, which lead us to forgetfulness and oversights, will be supplemented by information systems designed to support our needs.”

TOMORROW’S WORLD
systems, services and product providers

Across the board, solution providers are gearing up to take advantage of smarter homes and neighbourhoods’ potential to incorporate more efficient, digitally enabled, products and services.

True Digitalisation of the housing, care and health experience is just around the corner. Digitalisation is the focus of leading companies in every sector—from engineering and airlines to insurance, agriculture and retailing. The implications for our age-friendly homes are summarised in the following pages.

HOW COMPANIES ARE PLANNING TO DIGITIZE US AND OUR HOMES

The big four – Amazon, Apple, Google and Microsoft – are expected to have a very strong drive, based on their giant user bases and deep insight into how their customers use their devices and what content they consume. They know baby boomers will be expecting to run their smart homes from mobile phones and tablets (usually combined), within the ecosystem that the user chooses (usually one or two of the above). Or, perhaps they will not, because there is a growing swell of opinion that suggests that the future may be relatively device-free, at least in terms of hand-held or desk-resident devices, with ambient developments based upon Apple’s Siri, Microsoft’s Cortana, Google’s Assistant, Amazon’s Alexa and Samsung’s Bixby beginning to flex their digital muscles.

Taking with Marc Yvon, Director of the IBM Human Centric Innovation Center in Paris we learned that IBM is focusing on the idea of the cognitive house, which interacts directly with humans in a device-free way, using natural language interfaces driven by machine learning. IBM can be expected to work with any of the brands referenced above to supplement the use of analytics and provide deep insight. IBM’s work is being led by a team of top software scientists, focusing on emerging technologies and working with diverse ecosystem partners in different countries. IBM told us that two particularly important components supporting their offering in this area are its strong relationship with Apple and its focus on robotics, IBM is currently working closely with Age UK, with whom they have developed a demonstration centre in Portsmouth, and is also one of the sponsors of the Sphere project at the universities of Southampton, Bristol and Reading, which is developing home sensors to diagnose/manage health/well-being, to aid early diagnosis, lifestyle change and enhance the ability of patients to remain in their own homes.

IBM’s approach is in some ways similar to the heavyweight industrial software companies e.g. SAP and Oracle, who are mainly focused on the data that arises from smart homes (and from IoT in general) and how it can be analysed to allow customers to improve what they are doing, or give them help when needed or warn them. These businesses also help private and public sector providers of a wide range of services (e.g. insurance, health) meet their customers’ needs and/or avoid problems, such as fraud, high service costs.

A variety of other electrical and electronic providers, such as ABB, AEG, Bosch, Cisco, GE, Honeywell, Mitei, Netgear, Omron, Philips, Samsung and Siemens will be active in this world, often in partnership with the above providers whose services they will be carrying. These providers will be delivering much of the hardware that may be needed at the level of individual homes or industrial scale developments, and in some cases expertise in different areas such as voice recognition and management, security, managing domestic appliances, energy efficiency, lighting or even the provision of short-range communications middleware. Taken as a group, these companies are announcing wave after wave of new ideas and products, but gradually converging on the mobile-based system, sometimes through simple synchronisation via an app (e.g. GE Wink), or involving establishment of a separate hub (as with GE).

One of the common factors in the approach of all the above suppliers is that the Cognitive Home, cognitive health, cognitive care, in fact cognitive anything, involves lots of data being extracted from customers, their homes and their equipment, being sent to the cloud real-time for analysis and action, and information or conclusions from the analysis being sent back to the home or the customer. This is called cognitive computing. To be effective for the older adult, however, this process MUST constitute a true dialogue. This underlines the critical importance of the design of the Cognitive Home. Yes, on the surface it may seem a bit like the HAL computer in 2001: A Space Odyssey, but it is much friendlier and focused totally on meeting the needs of customers and making those customers feel that they are dealing with an equal which you can forget is not human.

Many of the above companies have developed special versions of their services to deal with health monitoring and coping with accidents, as they are all aware of the potential cost savings of earlier detection of problems and provision of improved solutions. In many cases, they are already deeply involved with meeting institutional requirements (hospitals, care authorities) and in these situations, compete with specialist health and care system businesses such as Tunstall in the UK.

Tunstall is a good example of a company that understands fully the need to combine Digitalisation with reliability. Kevin Alderson, UK Sales and Marketing Director told AAA that 100 per cent reliable connectivity was the core of its business, focusing on that segment of any generation which most needs this benefit and cannot rely on self-service. We may take digital technologies for granted, but 100 per cent reliable connectivity in the home cannot yet be guaranteed digitally due to problems with mobile phone connections and broadband capacity limitations. When this 100 per cent reliability is achieved, Tunstall expects to focus more on the provision of managed care, partnering closely with digital technology organisations.

MOBILE NETWORK, TELECOMMUNICATIONS AND MEDIA COMPANIES

The likes of AT&T, BhSbyB, BT, Telefonica/C2, Deutsche Telekom/T-Mobile, Italei, Liberty Global, Orange/France Telecom, Verzon, Virgin Media and Vodafone generally work from their core strength, and develop a proposition from it. Some of them have focused strongly on the idea of ‘owning the home’, but their problem has been that they have done it from their own perspective, rather than focusing on the needs of the customer as described in this report. This is one reason why most mobile network providers have failed to achieve the leap from provision of the carrier network to any application involving significant content or interworking with other providers, and have now effectively been intermediated by apps, so that the work is done by the software, usually coming from one of the categories mentioned above.

The exceptions to this are those providers who have made very large investments in triple or quadruple play (fixed line, mobile, satellite or cable distribution and content e.g. Liberty Global/Virgin Media, BSbyB and BT) and who therefore have a significant (paid) footprint in the homes of millions of customers, usually based on a hub of some kind (often also the router). However, these same companies have ensured that their products and services are distributable by, and can work well on, mobile handsets and networks, and compete with those of the giants (Apple, Amazon and Google) which also produce and distribute content. How this will play out remains to be seen, but we can expect that it will either lead to an emergence of a fifth or sixth serious giant player, whether in competition with or in alliance with one of the big four listed above when it comes to smart homes.
Entrepreneurs have spotted an opportunity to develop new products and services that meet the needs of an ageing population. Here AAA highlights a selection of advanced concepts and solutions encountered on our travels.

INTEROPERABILITY IS KEY
Cheaper technology paired with AI will mean more personalised products.

The wealth of products making their way onto the market to satisfy every possible need in our homes is staggering. But, before we get too carried away it is worth pointing out that everyone we consulted agreed on the need for interoperability, whether through iOS, Android, proprietary or independent platforms specifically designed to get the best out of the Internet of Things.

One of the most promising of this new breed is the universAAL IoT platform, which started life as an international R&D programme funded by the European Commission and is now setting up an Open Source coalition for developers seeing to ensure that “combines interoperability, whether through iOS, Android, proprietary or independent platforms specifically designed to get the best out of the Internet of Things.

The universAAL team is currently working on a test site in Weiterstadt near Darmstadt, Germany, combining 22 apartments providing accessible housing for people of all ages. The infrastructure of the building is of high technical standard, so the future basic needs of residents within a service oriented, ageing society, are fully catered for by the building. As part of this setup, services such as alarms, fall detection and other monitoring services are offered via a centralised network structure and sensor technology in each apartment. Special care services when needed will be provided by external operators. The concept takes into account the local neighbourhood which will also benefit from the care services and in turn socialise with and support the inhabitants.

The rapid evolution of universAAL IoT ensures that new features and applications are regularly added to integrated systems, bringing endless possibilities for the development of intelligent products and services which are able to instantly interact via the Internet of Things. With users able to effortlessly share valuable data between devices and systems, there is the flexibility and versatility to build a completely bespoke lifestyle environment.

One stand-out feature of this holistic interoperable system is called ‘CapFloor’, a clever cost efficient alternative for converting the floors of buildings to an invaluable source of information on the basis of passive sensor systems. The floor provides an exact reference for indoor localisation and a solid basis for realising plenty of use cases, from light control for both energy efficiency and fall prevention, to house-leaving control (particularly important for people living with dementia) plus reminders about devices left on, adapting the heating system, and/or burglar alarms. Where traditional floor pad sensors are very expensive and need to be integrated during the build stage, CapFloor can be introduced at any time with limited physical disruption.

Staying with smart surfaces we have seen reports of driveways tiles which “can turn your visitors’ footsteps into electrical power”, and weather monitors that regulate the watering of your lawn.

Thinking more laterally we quite fancy the idea of robotic chefs or laundry assistants, a “smart body analyzer” that measures your body mass index (BMI), and an exercise machine that “combines your workout with a unique flying experience”.

At the 2017 Consumer Electronics Show, there was an extraordinarily wide range of products that assist longer lives. This range will continue to expand. Fayet, for example introduced a GPS-enabled ‘intelligent walking stick’ that contacts carers if it falls over and uses AI to learn its owners’ regular movements, such as what time they get out of bed normally, alerting carers if this changes.

For those with limited hearing, Oticon revealed a smart hearing aid which can be controlled via an iPhone and connects with smart smoke alarms or doorbells and even controls ambient noise in busy rooms. With safety in mind, General Electric introduced an oven that automatically turns off if it detects burning food, while Unibot is a handy system that offers vacuuming, air purifying/humidifying and home security in one.

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Coming soon to a neighbourhood near you continued

PRODUCTS AND SERVICES REVIEW
Focus on mobility and Domestic Support

iWalkActive: Enabling active living
Declining mobility isn’t simply a barrier to performing the everyday physical activities of normal life; it is a loss of independence that is not always easy to accept and leads to growing dependence on caregivers. iWalkActive was born with the hope of restoring that independence. Conventional rollators and motorised “velopeds” are handy for getting about, but because they are quite basic ungainly tools, there is a stigma surrounding them. iWalkActive’s aim is to expand on the more advanced version developed by Trionic. With intuitive sensors, e-drive functionality and cloud-based services, this active walker brilliantly combines an array of technologies to drag the rollator in to the twenty-first century.

Web: www.iwalkactive.eu

ConnectedVitality: A new level of communication
Older adults with mobility problems can have difficulties organising their social connections and lifestyle in the way they want, which puts them in a situation in which they are reliant on others. ConnectedVitality has developed a video communication network that enables immobile senior citizens to organise their social network, choose an activity and select levels of social interaction according to their individual needs, abilities and lifestyle.

Web: www.yooom.com

DOMEO: Helper robots at home
A mobility assistive and companion robot providing personalised domestic services. Serving as a companion for older adults who are dependent and/or disabled, to help them to safely stay at home longer, DOMEO is permanently linked with the outside world and dedicated applications are integrated designed to help caregivers in their daily work.

Web: www.kompai.com

AXOSUIT: Modular full body exoskeleton for older adults
AXO-SUIT aims to deliver commercially viable assistive exoskeletons which will support older adults in their daily tasks and in participating in occupational and social activities. The project brings together academic and industry partners who are active and experienced in the assistive technology business to create a solution that meets older adults’ functional needs at an affordable cost.

Web: www.axo-suit.eu
In response to a brief from the Design Museum to “design a future product, service or system that keeps people on the move as they get progressively older”, PriestmanGoode has designed a Scooter for Life that can be adapted over time as our mobility requirements evolve, offering older users greater independence without the stigma associated with a mobility scooter.

The designers explain their concept:

“When we were commissioned to create a centrepiece about mobility for the NEW OLD exhibition, we immediately wanted to design a way to help people stay mobile for longer. Over the course of many brainstorming sessions, we came to a number of conclusions. First, we wanted to design something for all ages – a product for life, a brand that could follow you through life as your mobility needs evolve. Second, our solution should be a product designed to help people stay fitter for longer and provide older cohorts with independence as their physicality slows down.

“Indoor storage is particularly important from a safety point of view. At present, mobility scooters generally need to be parked outside the home, as they are often too bulky to be taken indoors or cannot be taken up the steps. This can introduce an unexpected safety issue. Parked in front of someone’s home, a mobility scooter can highlight the fact that an elderly or less mobile person lives on the premises, potentially increasing the risk of crime. Based on these key considerations, we developed the Scooter for Life, a product for all ages that is highly adaptable and helps older people improve their mobility in a practical way.”

**Scooter for Life**

**MiRO Dog – Sebastian Conran/Consequential Robotics**

MiRO is a biomimetic robot companion designed by Sebastian Conran in partnership with Consequential Robotics, a spinoff company from Sheffield University. Designed to be friendly and approachable but not toy-like, MiRO interacts with sensors, wearables, a data hub and assistive furniture as part of a total home robot system – the Care Free Home System.

**Beauty and ageing in the bathroom – Tomek Rygalik/Ideal Standard**

Bathrooms that include the needs of older people usually focus on safety and sterility. This Royal College of Art project, based on research conducted in the dressing rooms of older theatre performers, explores how the mirror and washbasin could create a sense of indulgence and luxury with a series of floating, glowing and flexible elements.
When it comes to radical disruptive concepts, the Aura Power Suit by Yves Béhar, Fuseproject and Superflex takes some beating. Here Yves Béhar talks about his concept for the Design Museum commission.

“All too often, lack of mobility due to muscle weakness, balance issues and coordination problems makes older people captive in their own homes. This has a cascade effect, increasing loneliness, isolation and depression. But what if technology could help us continue to move about the world and engage with it physically, socially and emotionally?”

“Our goal in designing for this exhibition is to show what technology can do for an ageing population right now. To do this, we partnered with Superflex, a commercial start-up that began in the Robotics Lab at SRI. Superflex is developing a new category of powered clothing that aims to enhance our physical ability so we can continue to live actively, bringing profound physical and emotional benefits.

“With motors, sensors and AI embedded into a lightweight and flexible fabric, the Aura powered clothing provides support for the user’s torso, hips and legs. It reacts to the body’s natural movements, adding muscle power to complement the user’s strength in getting up, sitting down or staying upright. In fact, powered clothing amplifies an individual’s ability to move freely – actually improving muscle strength, balance and coordination. The Power Suit, including its embedded hardware, will weigh less than 1.4kg.”

Designer Yves Béhar has also collaborated on another project for the Design Museum. ELLI•Q™ is an active ageing companion that seamlessly enables older adults to use multiple technologies, including video chats, online games and social media to connect with families and friends.

Produced by Intuition Robotics, a multidisciplinary team of gerontologists, roboticists, developers, industrial designers, computer vision and machine learning experts, ELLI•Q aims to inspire participation in activities by proactively suggesting and instantly connecting older adults to digital content such as TED talks, music or audiobooks; recommending activities in the physical world, keeping appointments and taking medications on time; and connecting with family through the likes of Facebook.

Using “Natural Communication” such as body language that conveys emotion, speech interface, sounds, lights and images, ELLI•Q is emotive, autonomous, and easily understood. Using machine learning, to understand the preferences, behaviour and personality of the owner, ELLI•Q proactively recommends activities based on its learning and based on recommendations by family. ELLI•Q also has the ability to monitor wellness and the environment in the home.
What new models of health and care are emerging to address increasing demand? AAA spoke with some of the stand-out stakeholders who are in the business of disrupting the way we currently engage with service providers.
HOW HEALTH AND CARE PLAYERS AIM TO SERVE US

Though some of us will be lucky and sail into older adulthood and beyond with good, or even perfect health, sooner or later most of us will need to call upon both health and care services. There are some radical and positive developments, but also plenty of gaps.

So much of what is written and said about health and care is apocalyptic, with forecasts of massive excess demand and declining quality. It is not the task of this report to depress our readers with forecasts of the doom and gloom we will face if we don’t act now.

Instead, we take the (avowedly optimistic) view that the forces of innovation (helped by the forces of competition) will come to our assistance, as they have done in many areas of human endeavour, although never without problems or without having to overcome the problems of professional conservatism and government caution. That is the nature of progress.

Just as in travel, with low cost airlines and app-based taxis, new business models of health and care are starting to emerge. In these new business models, information and communications technology is the enabler but not the main focus; for the services delivered are real, not virtual. In travel, it is humans moving from A to B and back again. In health and social care, it is humans living better, happier, safer and healthier lives than they would otherwise have done.

In health too, new models are emerging, not transforming every area, but certainly leading a more patient-centred and patient-controlled operation, though business model innovation, wherever it succeeds, balances the ‘centrality’ towards each category of stakeholders, to ensure that they each play their part in the most efficient, highest quality way possible, rather than shifting from being supplier to customer – centred.

In social care, for example, we are seeing the emergence of new models of provision (mostly app-based of course), by companies such as Vida and Supercarers. In the US, the new players include Honor, Hometeam and HomeHero. They follow a very different approach to the recruitment, training and efficient management of carers, to the matching of care clients with carers, to the involvement of families and to the provision of real time information providing improved communication and greater transparency. The net result is provision which is always higher quality and may if required be lower cost, sometimes with different payment models.

The good news is that care customers, whether individuals or organisations, and regulatory authorities such as the UK’s Care Quality Commission (CQC), are responding favourably to this approach. When AAA interviewed Naushard Jabir, Founder of Vida, the home care start-up had just received approval from CQC, making Vida the first care technology platform-powered home care provider to be approved.

In a recent Financial Times article, Naushard explained the thinking behind his business. Britain’s care industry has “hardly been touched by new technology. The company can afford to pay higher wages and offer training because it has reduced overheads, such as office space, by using new technologies. The minimum appointment is also an hour long, rather than the 15 minutes that most carers are paid to provide. Among the innovations at Vida are an algorithm to match patients with carers based on their location, skills, availability and expertise, as well as any cultural sensitivities or gender preferences.

“The carer receives the day’s schedule via an app, which tells them how long it should take to travel to the appointment as well as the customer’s profile, care history and requirements for that day. “It also allows the patient and Vida to track the carer’s progress, including after they arrive at the door. If there are any problems, the carer can raise a red flag via the app so the office can intervene and arrange, for example, more medicine or a doctor’s appointment.”

Until those who determine health and care provision policies (including governments) are attuned to the idea of business model competition, and are willing to help facilitate innovation, we cannot expect significant progress, even though the generation moving into the ‘high health demand’ phase of their life are much more likely to be ready for the new models.

ADDRESSING BARRIERS TO INNOVATION

We were reminded in an interview with Michelle Hawkins, the brilliantly titled ‘Head of Futures’ at Virgin Care, that helping older adults to make the most of their age-friendly homes is not just a question of health care, but about supporting their well-being. This includes the simple pleasures