



Social Care Digital Innovation Programme

Discovery phase report for exploring the potential for Cobots to support carers

A project delivered by Isle of Wight Council, working in conjunction with PA Consulting and Hampshire County Council with the support of Isle of Wight Carers, The Princess Royal Trust for Carers and Carers UK.



Carers provide invaluable support to their loved ones to the benefit of individuals and the state, but often to the physical detriment of themselves

It is clear that greater support for informal carers is required, as without them the future for our aging population, Health Service and Adult Social Care Services is untenable.

Our Discovery Project had a clear problem statement which we spent time refining during the start up phase *“Would informal carers benefit from cobot technology and would they would be willing to use it?”* We wanted to capture the voices and drivers of informal carers on the Isle of Wight and in Hampshire, and test our findings on a larger more disparate National scale.

We found that the informal carers we engaged with are providing often heroic levels of care to loved ones, in doing so they are often risking their own long term health and incurring preventable injuries and strain. Despite the physical exhaustion and social isolation our participants explained to us they all wanted to carry on caring for loved ones for as long as possible. One respondent said:

“We don’t give up because we have had enough. We give up because we just can’t do it anymore. No one wants to.... Even the language give up. It’s so judgemental and we feel so guilty already. It is devastating when you can’t care anymore”

We know that carers are critical to the increasingly fragile care sector, but being a carer impacts individuals emotionally, mentally, financially and physically. Our discovery phase focussed on the potential for robotic solutions to help address the physical impact of caring

Physical care demands and current support solutions

Our workshops allowed us to explore the importance of physical support, or the lack of it, in providing care at home. We discovered that most of our participants had adapted the way they used their home and bathroom equipment. Some participants had invested their own savings in a variety of aids and supports. However, even where paid carers and assistive equipment was in place, carers were struggling with transferring and moving those they cared for.

The wider survey echoed our findings, when providing care there is a lot of lifting and resultant back and joint strain and injury. This picture is likely to become more grave as carers age. We know that the fastest growing demographic in care is the over 70’s, when carers are themselves frail providing more physical support will take on increasing importance. The best way we can provide physical support is by physically supporting the carer.

Perceptions of Cobots (Collaborative robots) in helping carers

The participants in our workshops were overwhelmingly positive about the role of new technology in supporting them to care for loved ones. They viewed the exoskeleton cobots as a good idea as they would be made stronger and their joints would be protected. This positive mindset was also demonstrated in the wider survey, confounding some beliefs about the willingness of older people in particular to embrace new technology. Rather than selling the concept we know that the market demand already exists, we now need to drive towards a pragmatic, commercially viable solution.

Carers' experience

“ I needed to take her to the toilet in the night. I got out of bed and helped her, I have to swing her legs to the floor and support her to walk to the toilet. We move around in front of the toilet and I try not to drop her heavily. Afterwards we were both exhausted, I couldn't carry her back to bed so I dragged her, holding her under the arms..... I am her husband I said I would look after her..... once we were back at the bed I had to pull her up and try and roll and shove her on. All this time I was bleeding heavily, I have bowel cancer and I am not supposed to be doing heavy lifting, I feel weak after treatments. I don't know how much more we can take. ”

“ Brides ought to make sure they marry a man they can lift! I can't pull him upright in the bed, it's a struggle and he needs to be upright or he chokes on his saliva. Our retirement is not what we were looking forward to. ”



“ Your kids don't help much, I think they are embarrassed. It's amazing how quickly everybody disappears and you are just left on your own to get on with it. Its exhausting. By the time he is up and I've washed him and dressed him and he is in his chair I'm so tired. We should get out more but its just so tiring getting him into the car, and pushing the wheelchair. It gets on top of you. ”



Our participants own stories, their exhaustion and resilience in the face of difficult circumstances provide an urgent moral imperative to support informal carers. We found that carers were overwhelmingly positive about new technology, they were willing to try any tool or device if it would provide the real benefits of back and joint protection and increased strength. Evidence from both the workshops and the survey supported the view that carers were concerned with ease of use, that equipment should be easy to wear, light and quick to put on, rather than external appearance. Participants and survey respondents told us that they struggle on despite chronic back and joint pain, but we know that if carers neglect their own health both adults will become a drain on Adult Social Care budgets.

Informal carers are critical to the sustainability of the increasingly fragile care sector and demographic pressures will only exacerbate this precarious situation

It is estimated that the annual value of unpaid care is already four times what is spent by adult services departments each year. The vast majority of care in the UK is provided by family and friends who make up the countries 6.5 million carers. The care provided by these informal carers is currently estimated to be £119bn per annum, more than total NHS spending in England.

The financial case is compelling, but the impact is much more than just the monetary value of the care provided. Carers face many problems with emotional and mental strain, and the majority cite lack of physical support as a major problem.

Carers are twice as likely to suffer from ill health as non-carers. More than half of those who provide more substantial care have suffered physical ill health as a result of caring, and over 70% of those caring round the clock have suffered mental ill health at some time.

The GP patient survey in 2015 highlighted the impact of caring on carer health – whilst 51% of non-carers had a long-standing health condition this rose to 63% of all carers and 70% of carers caring for 50 or more hours a week. The survey also highlighted higher levels of arthritis, high blood pressure, long-term back problems, diabetes, mobility problems, anxiety and depression amongst carers.

As the UK care system continues to respond to the challenges presented by an increasingly aging population, supporting carers, who are themselves ageing, will be an imperative to allow them continue in their caring role.

We are living longer, but for many of those extra years we will need care. Carers are increasingly older people themselves and the profile of carers is expected to change in the future due to factors such as more women in the workplace and later retirement .

Whilst the total number of carers has risen by 11% since 2001, the number of older carers rose by 35%, this trend coupled with the forecast demand for complex care and the rate of morbidity at the end of life, build a picture of an aging population dependent on elderly carers, who may be frail themselves. Carers UK estimates that we will see a 40% in the number of carers needed by 2037, and that carers will increasingly be 65 or older themselves.

The rise in older carers should be a cause for concern as frail carers are more likely to be overwhelmed by the physical aspects of caring, Worryingly, given the greater than average rate of increase in older carers some 64% cite lack of physical support as a major problem, which ultimately would curtail their ability to provide care.

Local pressures on the Isle of Wight and in Hampshire have prompted exploration of the potential for physical assistive robotic technology to support carers

Carers need support in providing physical care, but relying on the paid care workforce is not the solution. Families do not want to be reliant on strangers, the cost will be prohibitive and the paid care workforce will not be able to cope with demand.

The Isle of Wight and Hampshire both have an older population than the national average and local demographic data suggests a worsening problem. The paid care workforce in both locations is already stretched with challenges in recruitment and retention.

Key statistics from the Isle of Wight



- 27% of the Isle of Wight population was aged over 65 in 2017, a higher proportion than SE England average of 18%
- 65-79 year-olds predicted to grow by over 16% in the next ten years, and over 85's predicted to grow by 40% in the same period
- 1 in 6 households on the IoW consist of a 65+ adult living alone
- The working age adult population of the IoW is decreasing as young people leave the island
- 11.9% people on IoW provide unpaid care (compared to 9.8% in SE region and 10.3% in England and Wales, 2011 census)

Key statistics from Hampshire



- 21% of the HCC population is over 65, a higher proportion than SE England average of 18% Of the over 65 population, 1 in 2 are over 75 years, 1 in 7 are over 85 years;
- Hampshire's total population is expected to grow by 7% between now and 2023, however the growth will be driven by increases in those aged over 65.
- By 2030 for every 2 people of working age there will be 1 person of pensionable age in Hampshire, impacting demand for services but also workforce demographics.
- 10% people in Hampshire provide unpaid care (compared to 9.8% in SE region and 10.3% in England and Wales, 2011 census)

It is inevitable that care services will find themselves under increasing pressure to meet demand. Unpaid carers will remain critical to the sector, but new solutions must be explored to support them and ensure this model of care is sustainable.

Collaborative robots (Cobots) are robots that interact with a human in shared space. Cobots, and in particular exoskeletons, are one type of Physical Assistive Robotic technology that could support carers in elements of their caring role. Rapid advancements are being made in academia and by Cobot suppliers but investment, and therefore most progress, to date has been made in developing exoskeletons to be worn by an individual to aid their own rehabilitation.

Cobots are being introduced for lifting and handling for other sectors in the UK e.g. car manufactures, whilst in Japan Cobots are already available to support paid care workers in a nursing home setting but are yet to be mainstreamed.



Our project sought to explore perceptions of Cobots as a potential solution to support informal carers in their role of delivering physical aspects of care giving

Our Discovery Phase user engagement focussed on exploring the perceptions that carers had of Cobots and identifying design features that would influence their desire and ability to adopt such technology to support them in providing physical care

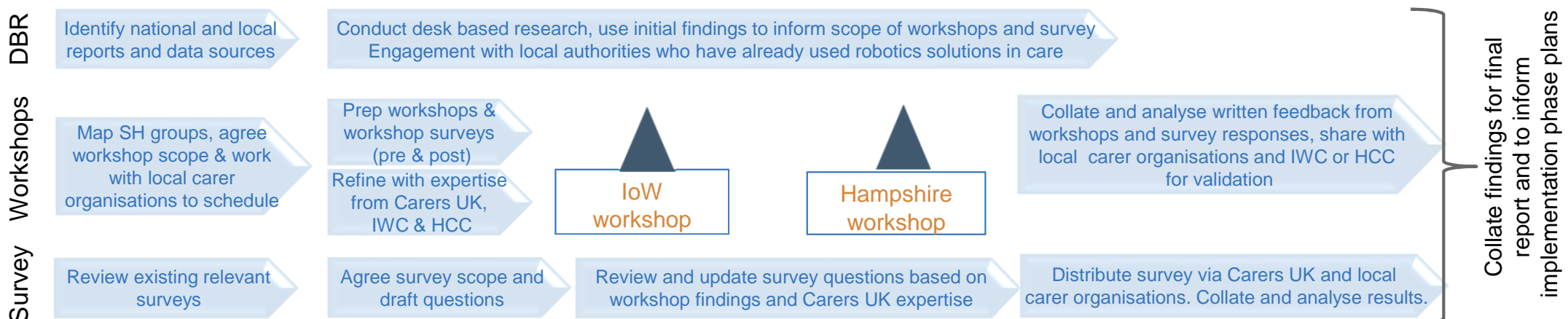
Cobots could enable a carer to continue to provide support for a loved one beyond the point when they might otherwise be forced to give up because of their own frailty. Research has identified that one of the biggest barriers to utilising robotics in caring scenarios is public perception. An objective for the discovery phase of this project was to test that hypothesis and to understand what objections people might have to cobots being used to support them in delivering the physical aspects of their caring role.

The approach to the discovery phase provided opportunity for us to review and reframe our problem statement if required.

We engaged and built on existing expertise within sector from Carers UK and captured learnings from other authorities who have used robotics for other use cases to inform our user engagement.

Our engagement approach was designed to allow us to design and tailor our wider user engagement survey based on the findings of our workshops. We reviewed workshop findings and survey questions with partner organisations throughout to ensure validity of our approach.

Whilst our problem statement remained valid throughout the project, one element of our approach that was amended based on feedback received, was the need to schedule a workshop outside of school holidays. As such a third workshop will be held in early October, following submission of this document but headline findings will available to be shared during the project presentation event.



Our research methodology balanced in-depth user discussions with a wider volume of user responses via survey, supplemented with learning from existing sources

We designed our research methodology to allow use of existing data to quantify the scale of the issue locally, explore what aspects of physical care is provided by carers, what technology is currently available to support them and perceptions of this. Ultimately we sought to understand perceptions of cobots amongst carers and seek their input into prioritising user requirements for solution design.

Desk-based research

- Review of existing research papers to understand the extent of robotics and, in particular, cobots in care
- Engagement with suppliers of cobots and academia to understand current and future solutions
- Review of existing research exploring perceptions of technology in the care sector
- Engagement with Carers UK, review of national research
- Analysis of local data from Hampshire and Isle of Wight

Workshops

- Engagement with local carer organisations to facilitate logistics, with workshops held locally
- Total of 22 participants across the two workshops held to date; questionnaires completed by most participants pre and post workshop
- Facilitated discussion sought views on the role of a carer, the biggest challenges, the physical aspects of care and their perceptions of cobots



Survey

- Reviewed existing Carer surveys to ensure that we were not reinventing the wheel
- Developed draft questions based on our hypothesis, shared with Isle of Wight Council, Hampshire County council and Carers UK to benefit from their expertise
- Reviewed and refined the survey questions following workshops to ensure appropriateness and robustness
- Distributed via Carers UK and local carer organisation networks

Engagement with other LAs

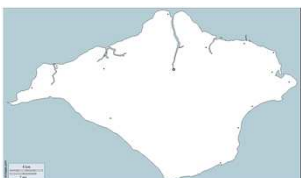
- Benefited from the LGA network and their signposting to Stockport and Southend
- Reviewed Hampshire's existing work regarding cobots (that focussed on the paid domiciliary care workforce)



This section sets out our findings from Desk-based research, our user workshops and our wider survey

The Isle of Wight and Hampshire both recognise the important role that carers have supporting their local populations.

The Hampshire Joint Carers Strategy 2018 – 2023 sets out the Carer Charter and how they will achieve the key aims of the strategy, and the Isle of Wight work closely with Carers IW to ensure the council is cognisant of and responsive to carer's needs.



Isle of Wight Carers profile

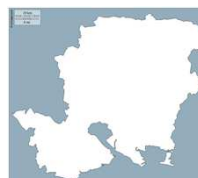
The Isle of Wight has an older population than the UK average, the projected population increase in over 65s and over 85s is estimated to grow faster than the UK average.

11.9% of the Islands has a caring responsibility, with 4,104 informal carers providing 50+ hours care per week.

The population is expected to grow to 146,600 by 2026, assuming a similar percentage will be carers that equates to 17,445 carers on the Island.

One in three of those in their eighties will require care, an expected 15,842 Island residents will be over 80, with a third of them requiring care.

It is anticipated that the population of over 65s will grow by 18.9% in the next ten years and the over 80s will grow by 40%.



Hampshire Carers profile

In the 2011 Census 133,000 people in Hampshire identified as carers.

People over the age of 65 provided a quarter of the unpaid care in Hampshire. 40% of carers over 65 provided more than 50 hours of unpaid care per week.

The overall population of Hampshire is expected to grow with higher than average growth in the older population. Creating pressure on Adult Social Care budgets.

The size of the older population in Hampshire is expected to increase with a corresponding increase in older carers. There will be 54,000 over 85s by 2023, one third of these are expected to require care, 18,000 people.

The challenges faced by Carers across the UK are mirrored on the Isle of Wight and in Hampshire. Demographic changes and associated predicted rise in demand for care services clearly justify a continued focus on supporting carers and seeking new, innovative approaches to maximise the support available to sustain their crucial role. Our survey and workshop engagements suggest a high level of carer injury and physical strain, in line with Carers UK and GP Survey research. Alleviating difficulties in provision of physical care would improve carer well being and save money.

Existing research indicates that people want well-designed products that meet their needs but no evidence exists of how cobots would be perceived by carers

Review of existing evidence of perceptions of cobots in care

This is a true discovery phase project. Cobots or Physically Assistive robots do not currently exist within the UK care market and are still at a relatively embryonic stage within the Japanese market, where they are available in some settings to support the paid care workforce. Japanese citizens are recognised as being more accepting of robotics than UK citizens and so we did not review research of Japanese carers' perceptions of cobots in care, but sought to draw parallels from UK research into Assistive Technology (AT).

Drawing parallels from UK research into perceptions of other assistive solutions

AT has been defined as 'any device or system that allows an individual to perform a task that they would otherwise be unable to do, or increases the ease and safety with which the task can be performed' (Cowan and Turner-Smith 1999). Research has been undertaken exploring older people's views about the use of AT and smart homes, and headline findings found that the elderly are willing to embrace AT when there is a clear felt need, or use case coupled with a good quality product. Good in this sense means not just fit for purpose but also well designed to meet the felt need.



Rapid Pace of Change could deliver useful affordable products quickly

During the Discovery phase we have seen new developments in the cobot exoskeleton come to the market and to media attention. There is a growing interest in making cobots from flexible materials and fabric, to create suits which could be worn discretely and turned on when the user needs power. These developments could be capitalised on for informal carers who do not need the same performance level as a person wearing a cobot in a manufacturing or military setting. The rapid rate of change suggests we should engage with manufacturers and ensure that the informal care market is seen as a commercial opportunity.

Minimising the impact that pre-existing negative perceptions regarding 'robots' may have on our ability to truly test user perceptions of cobots.

Much of the press and publicity around robotics in care has been sceptical/negative based on a perception that robotics would replace human contact. The use-case for cobots for informal carers is based on enabling a carer to continue to provide support for a loved one, and not replacing human contact but we recognise the impact that terminology may have on our user engagement efforts.

We reflected on the existing research and ensured that our terminology when introducing Cobots was focussed on the outcomes that the technology can achieve, and the Cobots terminology was introduced carefully to avoid immediate negative perception linked to robots

Our local workshops allowed us to explore the challenges carers face in providing physical care and how technology that is available today is perceived

Providing physical aspects of care is a very real challenge

Our respondents listed a range of physical assistance tasks that were part of their carer role. Whilst some were every day occurrences, others – such as helping their loved ones get up after a fall – happened less regularly, but had a significant impact and were of very great concern when they did occur.

“My Mum fell, I tried to lift her using the wall but we just couldn’t get her up. After I had been waiting over an hour, I went into the street and asked a gardener to help – thankfully he could lift her and put her back in bed.”

Physical aspects of carer role

- | | | |
|-----------------------|-----------------------|-----------------------------------|
| • Transfer for bed | • Transfer for car | • Help going upstairs |
| • Reposition in bed | • Help feeding | • Help them get up after a fall |
| • Help with dressing | • Help cleaning teeth | • Transfer to wheelchair and push |
| • Transfer for toilet | • Help with bathing | |

Many of the carers referred to physical strain or injuries they had suffered as a result of providing physical care, one participant had displaced five discs in her back, another suffers from continuous pain in her shoulder and upper arm, and another has continuous back and joint problems.

“My wife has had three operations on her shoulders in the last four years, she has missed two years of work altogether.”

Reflections on existing equipment and home adaptations

Respondents were vocal in their shared dislike of the available equipment, reporting that it rarely works well in real life contexts, is bulky and often cannot be made to fit their homes easily.

They all stated that wheelchairs, frames and stairlifts were ugly and constantly on show and in the way. One participant complained that equipment was heavy and difficult to move. Many stated that they would not downsize because smaller ‘more suitable’ homes were inappropriate for their needs as the corridors and doorways were too small for wheelchairs and other mobility aids. However, securing adaptations to their existing homes was not easy or timely.

Space and equipment constraints were seen to impact the safety and dignity of care

“You push the wheel chair in and the person is facing the toilet, with you behind, you have to squeeze past and lift them up and turn around, so they are in the right place”

“Lifting and turning at the same time is dangerous.”

“If there isn’t enough room for the chair its humiliating”

“We have a walki talki! that’s how we manage to communicate”

Ramps were seen as problematically heavy and awkward, difficult to put in place, heavy and large they were not viewed as portable. Hoists also came in for particular criticism, with recognised limitations in portability and the negative impact on the cared for person, both as an unpleasant experience but also as further disabling them, as opposed to a stand-frame that could help some maintain physical strength.

The workshops presented a valuable opportunity to test the desire for cobots in care, capture user requirements and test the impact of terminology on perceptions

There was an overwhelmingly positive response to the idea of a device which would protect your back, and knee joints and could make you stronger.

The participants could see benefits to carers who needed to lift or move the cared for person, even if they felt that they did not need help with that yet. Participants were quick to identify specific instances where the technology would help them.

“That looks brilliant I needed that last Tuesday, i just didn’t have the strength.”

“I could do with one of those to help me lift him on the bed”

“In order for my mum to stay at home I need that”

“That could be hidden in a cupboard, its not so big and bulky”

The post survey questionnaires captured that all participants said they would like a cobot now, or in one case in the future, as the need arose to move her partner. One participant observed that it would help him to lift the bulky equipment needed to help his wife. Another observed that he was strong, but his knees were weak, a device which would take the strain from his knees would enable him to lift and carry his wife without worrying about his knees

What should influence future development

Participants talked extensively about the appearance and practical features the cobots would need to have. One said that the cobot would have to look acceptable, however it was quickly agreed that appearance was not as important as functionality.

The following factors were cited as important design considerations for cobots to be used by carers

- Cost
- Appearance (not too robotic)
- Portability (around home and in car)
- Quick to put on
- Easy to put on (do yourself)
- Not too bulky (fit down hallway)
- Comfortable, not too heavy
- Breathable material
- Desirable to be on a charging frame, an you could back into the suit and fasten it up

The detailed feedback reflected a genuine desire from participants to support the development of this technology. There was a positive perception overall, with all participants recording their willingness to use cobotic technology in the caring role.

The choice of terminology used and its impact

We introduced cobots with pictures and descriptions of how they are intended to work, together with the outcomes they can help achieve. We deliberately avoided using the term cobots initially. At the end of the workshops, we asked whether the terminology would have changed their view regarding the solution.

They reported that they would have expected a robot that looked like a humanoid, moved independently and that could lift and move the cared for person. They felt “cobots” was off-putting as it sounded like science fiction, and that a robot solution sounded unsafe so they would not trust it.

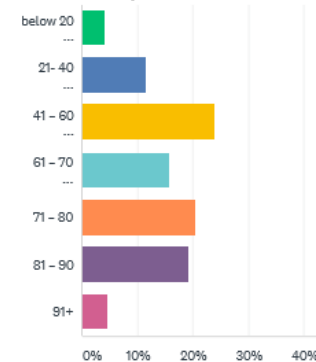
The survey validated our initial ideas. We asked carers about physical aspects of care: 146 responded and almost 60% would use a cobot today if available

Analysis of survey responder profile

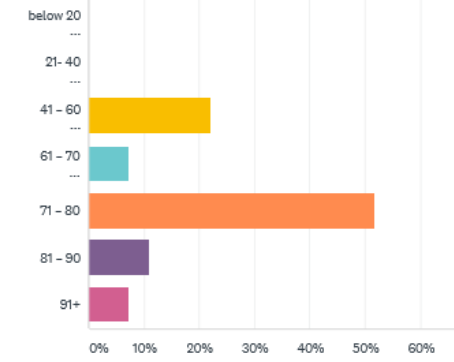
Carers are looking after a wide range of people but predominantly older people with 45% of those receiving care over 70 and 5% over 90. For carers who are over 70, those figures are more pronounced with 70% of cared for people being over 70 and 7% over 90.

The survey showed that 65% of respondents received no support from paid carers. Of those that did receive support the majority had one or two visits a day 43%, and a further 30% received 3 or 4 visits a day. Over 80% of respondents have made adaptations to their home, in order to cope, in comments some suggested they were cash constrained from further adaptations.

Age of cared for person(s)
all respondents



Age of cared for person(s)
carers over 70

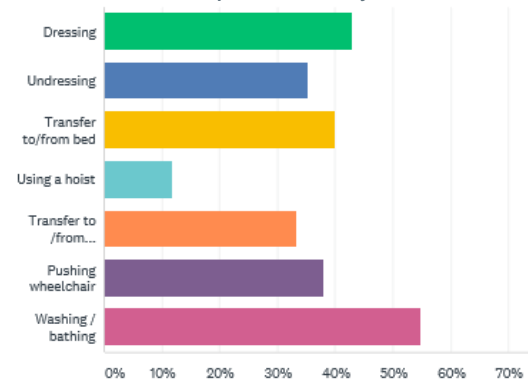


Almost 60% of survey respondents would like to use a cobot to help them provide care today if they were available.

Of the over 70s 44% would like to use a cobot now, and a significant number indicated they would be willing to see if a cobot would help them to deliver physical care. 84% of respondents were not put off by the terminology or pictures shown, echoing our workshop experience, respondents were more focussed on the functionality of the cobots.

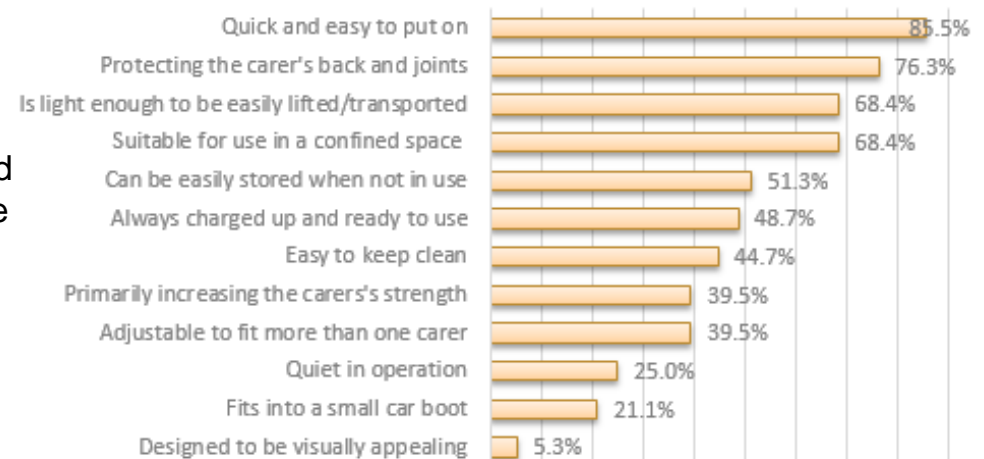
“Protecting myself is paramount. Who can care for my loved one if I get a major strain injury? Injuries can happen so quickly.”

Most Difficult Aspects of Physical Care



Over 50% of our respondents had suffered injury or physical strain as a result of caring. Predominantly back and joint pain. We asked them to identify the care tasks they found the most difficult and it was clear that a device which could support the carer in a wide range of activities would be better value for money than a piece of equipment that could only do one thing.

Factors which would drive use of a cobot



The discovery phase has validated our original problem statement; informal carers would benefit from physical assistance and welcome the idea of cobots

Our desk research has shown the scale of the problem nationally and locally to Isle of Wight and Hampshire

By 2036 35% of the population on the Isle of Wight is predicted to be over 65, and in Hampshire the figure is 32%. We know that people are living for longer, and that there will be a significant care need at the end of life for many people. At the same time carers are themselves aging, increasingly carers are elderly and frail themselves. A majority report that they struggle to provide physical care, the stories we heard in our workshops were harrowing, as families feel guilty, exhausted and suffer carer burnout.

“You have no one to turn to, its surprising how quickly you are on your own”

“There is no help, you get stuck in the house, sometimes I am too tired and he just has to stay in bed”

Practical support from technology can help. The Argenti service in Hampshire has proven that telecare and voice recognition technology can support carers, as well as the cared for person, and we believe cobot technology is the next step.

Our workshop findings, coupled with the evidence from the wider survey, show that there is a demand for cobot from carers

Importantly, carers themselves are interested in new forms of support to enable them to care more effectively. We found that this result was true across age groups, despite a perceived view that older carers, particularly those in their seventies and older would be hostile to new technology.

“That looks brilliant I needed that when my husband fell, I just didn’t have the strength to pick him up”

“In order for my mum to stay at home I need that” (cobot)

Carers reported that physical exhaustion and isolation were the key factors that would drive them to stop caring. By alleviating exhaustion we believe we can significantly reduce the pressures on carers, and in turn on the wider care sector.

As 58% of carers are caring for someone with physical care needs that is a potential 3.77million carers in the UK that could benefit today, and a potential 5.2million by 2037. (Based on Carers UK data). In our survey we found 43% receive support from the paid care workforce twice a day, a further 30% receive four visits a day. Some of these visits could be avoided if carers were able to move their loved ones independently. The nature of paid care workforce visits could be changed to allow for emotional and practical support, meeting the holistic needs of the cared for person, and equally important for their carers.

The scale of the need has been demonstrated, the economic case is overwhelming. There will simply not be enough paid care workers to meet predicted need and unpaid carers will become even more crucial to the sustainability of the care service. The challenge is how to maximise the potential of cobots for the sector in the most cost-effective and timely way.

Robotic solutions have been trialled in the care sector, however no solutions are mainstreamed and delivering robust evidence of outcomes, yet.

Southend Borough Council took a conscious decision to invest in robotics to respond to the persistent and increasing challenges facing the care sector, and to actively respond to the rhetoric of ‘we need to do something differently’

In 2017 they unveiled PEPPER the robot, a humanoid companion robot developed by Sottbank, to local adult social care staff ahead of showcasing at the NCAS conference.



Southend did not set out with a specific use-case in mind but rather sought to change the conversation around social care and cultivate opportunities that emerged from curiosity around Pepper. To that end, they have been very successful and the wide range of activities that Pepper has participated in reflects the council's approach of being open to suggestions from the community. Pepper has been trialled with dementia sufferers, in Primary schools, at business breakfasts and with children and young people on the Autistic spectrum

Southend have had a very positive experience with Pepper, their open minded approach and absence of any time constraint have enabled them to try the robot out in a number of different settings and has allowed them the freedom to build enthusiasm across the council, the borough and with the public.

Southend's adoption of Pepper has promoted the agenda that robotics and digital technologies are part of the world, including the world of adult social care, and that they are tools that the sector needs to adopt and use more broadly.

Stockport Metropolitan Borough Council have experience of working on two E.U funded robotics trials.

Project Mario

“Mario”, a robot designed to provide companionship and interaction for people living with dementia. It is intended to reduce isolation and loneliness in older people with memory problems.



Project Silver

A user engagement trial as part of a pan European project trialling the LEA, robotic walker, intended to support mobility and through the use of APPs provide cognitive support.



The two trials were at different stages of development, attracted different levels of funding and resource (externally and within the Council) which impacted the progress and success of the local trial. Ultimately neither product is commercially available yet and further work on re-design, certification and other necessary pre-commercial activities are believed to be underway. User engagement showed challenges of perceptions of robotics, (although it was by no means universally negative) and the need to manage staff and user engagement carefully.

Hampshire County Council explored potential for cobots in the domiciliary care market.

This work found that there was a significant potential benefits but no clear roadmap for a solution to come to UK market. It suggested the care sector work together, with suppliers, to drive the pace of development to address needs of the UK care sector.

Our reflections and learnings from the discovery phase reiterate the importance of users in validating problems, informing solutions and inspiring focus for progress

Engaging with users directly provided invaluable insight into our problem statement.

User engagement is clearly at the heart of this programme and knowing that the LGA recognised and supported this was helpful in ensuring sustained focus of the user story throughout.

Hearing the real life experiences and frustrations of carers was crucial and reinforced that the needs of users should remain at the heart of any future work.

An additional benefit from facilitating face-to-face exploratory workshops with carers was that it opened the conversation, and allowed identification of other needs (not in scope for this work) and other potential solutions, and at least one of these is being progressed by IWC with local partner organisations.

Importance of robustly testing assumptions and validation of problem statement prior to wider engagement

Our chosen approach allowed us to refine our understanding of the problem at each stage, to ensure that we were maximising the value of each element of our user engagement programme.

There is a huge amount of interest in the field of robotics and AI and the potential it has to transform the care sector. It would have been easy to get distracted and broaden the scope of our discovery phase or be overwhelmed by the potential complexity of the solution and hurdles to be overcome. We were able to retain a tight focus on our specific problem statement through testing its validity at each stage.

Responding to feedback and amending programme timings

We encountered some challenges and negative feedback to scheduling face-to-face user engagement sessions over the Summer holidays. We mitigated this through close working with local carer organisations and ultimately, through scheduling an additional workshop at a late stage of the project. This allowed us to use feedback from the two earlier workshops to inform our wider survey, whilst also providing opportunity for more carers to provide their insight than would otherwise have been achieved if we had only facilitated engagement during the August workshops.

We valued the opportunity to connect with other authorities

The LGA were We participated in the peer-learning calls but on reflection found that we derived the most benefit from our direct discussions with the Councils who had experience of deploying robotic solutions.

Building on momentum to progress solutions

Our headline findings is that the problem is very real and solutions are very sparse, but there is a significant appetite amongst carers for a solution such as cobots.

Carers were aware that development of these solutions may not happen swiftly enough to help them as individuals today, but they recognise the need and potential for future generations and as such were keen to contribute and support progress of this project.

The discovery phase successfully validated our initial idea that carers would welcome cobot technology to help them provide physical care to their loved ones

When we talk about robotics in social care people tend to think of humanoid robots taking over from human carers. Films and television series from Terminator to Humans do nothing to dispel the idea that such robot helpers could turn on us, their human creators. At the very least robot carers are seen as a poor substitute for human care and another sign that we are not treating our most vulnerable members of society with the care and respect they deserve.

In such a value laden atmosphere can there be a positive case for the use of robotics in social care?

The reality is much more complex than some reports in the media would suggest, socially assistive robots designed to supplement human care are in development, but so to are cobots – and in particular exo-skeletons, designed to work with human direction as a physically assistive robotic solution.

Our work highlighted the significant potential for cobots to support carers and, in contrast to popular perception, a clear appetite from carers on the Isle of Wight, in Hampshire and nationally, for such a solution to enable them to continue caring for their loved ones.

The scale of the need facing the care sector on the Isle of Wight, in Hampshire and Nationally is such that it presents an attractive market to manufacturers. Despite the enormous potential there is no approved or economically viable care cobot available for the UK sector today. It is important to explore UK use cases and understand requirements as ultimately users will be sensitive to design features that will make the products suitable for their use in the UK market.

The discovery phase has validated our initial idea and has bolstered the need for continued efforts to influence the development of robotics for the care sector, to ultimately ensure solutions are developed that will benefit individuals and the sector at scale.

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