Voice

# Will IoT care for me?

## June 2020 Voice workshop scenarios


Pitch-In

The project is funded by Research England's Connecting Capability Fund (CCF)

The project is a collaboration between:

UKRI Research England

The University Of Sheffield.

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF OXFORD

Newcastle University

# Will IoT care for me? – scenarios

On the following pages, you will see 6 different scenarios involving the use of Internet of Things (IoT) technologies for health and wellbeing purposes. These scenarios, along with the people and the uses of the technologies portrayed in them, are all fictional. However, the technologies (or something very similar to them) are all either currently available or else are under development or have been proposed in the medical and academic literature.

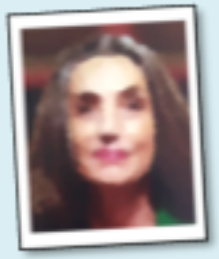
Broadly speaking, the scenarios all concern **personalised care**, in other words, the use of IoT to maintain or improve the health or wellbeing of individuals. Each scenario falls into one of 3 categories of personalised care:

- **lifestyle management**, helping people to stay healthy and live well for longer: scenarios 1 & 2 (blue backgrounds).
- **condition management**, supporting people to monitor and control known health conditions: scenarios 3 & 4 (red).
- **assisted living**, helping people with disabilities to lead better lives: scenarios 5 & 6 (green).

These scenarios will form the basis of group discussions during the workshop, and you might like to read through them in advance (although don't worry if you don't find the time: you will still be able to participate fully in the workshop). Note that the scenarios are presented here for the purposes of discussion only; the appearance of particular technologies within them should not be taken as an endorsement or recommendation.

If you have any questions or comments please get in touch with Stephen Potter, researcher at The University of Sheffield (stephen.potter@sheffield.ac.uk).

# Scenario 1: Mary



**Biography:** Mary lives alone in the house in Leeds that she shared with her husband until his death 5 years ago. She worked part-time as a bookkeeper until she retired at age 60. She has one daughter, Joanne, who lives with her family in Sussex. She has some local friends who she meets for coffee, and she enjoys trips into town to visit the cinema and attend concerts.

**At a glance**

| | |
|---|---|
| *Age:* | 74 |
| *Location:* | Leeds |
| *Family status:* | Widowed, 1 child |
| *Education:* | Secondary school |
| *Employment status:* | Retired |

**Health:** Mary was diagnosed with Alzheimer's disease last year. Her symptoms have been quite mild, occasionally forgetting things and strumbling over words, but twice recently she has been found by neighbours outside in the street in a confused state. One of her neighbours telephoned Joanne, her daughter, to let her know.

**Goals:** To stay independent.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | . | . | . | X | *cautious* |
| *organised* | . | X | . | . | . | *careless* |
| *outgoing* | . | . | . | . | X | *reserved* |
| *friendly* | . | . | . | X | . | *challenging* |
| *sensitive* | . | X | . | . | . | *confident* |

**Technology**

Broadband access: No Smartphone: No

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | X | . | . | . | . | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | X | . | . | . | . | *high* |

**Scenario:** After the most recent episode when Mary was found in the street, Joanne spoke to Mary's GP who suggested that some sort of home monitoring technology might give Joanne peace of mind by allowing her to keep a eye on her mother remotely. Searching online, Joanne has found a monitoring kit provided by a private company which consists of a number of sensors placed around the home. These include door sensors, to monitor anyone entering or leaving the property, plug sensors to monitor energy usage (useful for seeing whether Mary has used the kettle to make herself a cup of tea today), and motion sensors, which can show if Mary is wandering during the night or even if she has remained stationary for too long, perhaps as the result of a fall. The company will install the kit, but does not provide emergency response. If there is a worrying sensor reading, Joanne will receive an alert through a smartphone app. She has discussed the idea with Mary, but Mary is unsure: it sounds as though the technology could be used to spy on her and track her movements.

Do you think the monitoring kit sounds like a good idea? What advice would you give Mary and Joanne? Is there anything else they should consider?

# Scenario 2: John

**At a glance**

| | |
|---|---|
| *Age:* | 64 |
| *Location:* | Gateshead |
| *Family status:* | Married, 2 children |
| *Education:* | Secondary school |
| *Employment status:* | Retired |

**Goals:** To see his grandchildren grow.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | . | . | X | . | *cautious* |
| *organised* | . | . | . | . | X | *careless* |
| *outgoing* | . | X | . | . | . | *reserved* |
| *friendly* | . | . | X | . | . | *challenging* |
| *sensitive* | . | . | X | . | . | *confident* |

**Technology**

Broadband access: Yes Smartphone: Yes

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | X | . | . | . | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | X | . | . | . | . | *high* |

**Biography:** John worked in a steel production plant until his retirement 2 years ago. He has been married for 40 years, has 2 adult children and 3 grandchildren, all of whom live nearby. He and his wife live in a semi-detached house on a modern housing estate.

**Health:** John had a mild heart attack 3 years ago. Since then he has given up smoking, but he would be the first to admit that his diet is not healthy, that he drinks a little too much and that he does not get enough exercise.

**Scenario:** One of his ex-work colleagues has suggested to John that he should buy himself a Fitbit activity monitor. It would encourage him to exercise more, at first by walking more, but later on maybe he would be able to join his friend and some other ex-colleagues in the weekly Parkrun in the local park. John likes the idea of being more active, and being fit enough to play football with his grandchildren, but as someone who previously considered himself reasonably fit, his heart attack came as a shock to him, and he fears another attack. Also, he is not very experienced with digitial technology and the internet, and is wary of scams, and he doesn't have a great deal of money to waste on gadgets he might abandon after using a few times.

Do you think John's friend's suggestion is a good one? What advice would you give John? What else does he need to consider?

# Scenario 3: Stanley

**Biography:** Stan lives with his wife in the terrace house in Liverpool they moved into after they were married in 1979. The house is big enough for them (at least, it is now that their 2 children have left home), and it's within easy walking distance of Anfield. Stan likes a drink or two with his mates after the match, and after work will often bring a take-away home to eat with his wife. He drives to work at a car assembly plant outside the city, and is hoping to be able to retire in 2 or 3 years' time.

**At a glance**

| | |
|---|---|
| *Age:* | 63 |
| *Location:* | Liverpool |
| *Family status:* | Married, 2 children |
| *Education:* | Secondary school |
| *Employment status:* | Full-time |

**Health:** Stan was diagnosed with type 2 diabetes twenty years ago. He knows about the importance of monitoring his blood glucose levels and food (and drink) intake, and of going for regular check-ups, but he is not very organised, sometimes even forgetting to take his insulin to control his blood sugar levels. Also, he sometimes lacks the willpower to resist another drink or a second helping of pudding. Recently his eyesight has been troubling him, and he has had a tingling sensation in his feet.

**Goals:** To see Liverpool win the title again.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | X | . | . | . | *cautious* |
| *organised* | . | . | . | . | X | *careless* |
| *outgoing* | X | . | . | . | . | *reserved* |
| *friendly* | . | X | . | . | . | *challenging* |
| *sensitive* | . | . | X | . | . | *confident* |

**Technology**

Broadband access: Yes Smartphone: Yes

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | X | . | . | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | X | . | . | . | *high* |

**Scenario:** Stan's GP has recently become more concerned by the state of Stan's health, and by his apparent inability to maintain close control of his lifestyle. She has suggested to Stan that he might like to consider using a new type of 'smart' insulin pump. This is small device, about the size of a matchbox, worn on the skin under his shirt and which, though a small needle, would be able automatically to measure and record his blood glucose levels and calculate an appropriate dose of insulin. It would share this data using Bluetooth with an app on Stan's smartphone. On the tap of a button, the app would allow Stan to administer the dose wirelessly, and it would also regularly share Stan's data with his GP so she could keep an eye on his progress.

Do you think this is a good idea for Stan? What advice would you give him? What more do you think he should find out about the technology?

# Scenario 4: Rosa

**Biography:** Rosa moved to the UK from Spain with her husband 20 years ago. Her two children have been raised here, and now have families of their own, and they are all settled in England and consider it their home (although her children sometimes make fun of her when she speaks English, and indeed she wishes it were better). Now that the children have left home, Rosa has been working part-time in a café, a job she really enjoys. She also enjoys chatting with others at the local language-skills coffee mornings and spends a lot of time on the internet using Skype to catch up with news from members of her extended family in Spain and Venezuela.

**At a glance**

| | |
|---|---|
| *Age:* | 53 |
| *Location:* | Southampton |
| *Family status:* | Married, 2 children |
| *Education:* | Secondary school |
| *Employment status:* | Part-time |

**Health:** Although Rosa's health is generally good, recently she has been feeling very tired during the day, with occasional severe headaches, which makes it difficult to concentrate at work. Her GP thinks that she might be suffering from sleep apnoea, a common condition in which breathing is interrupted during sleep, which in turn leads to oxygen deprivation and fatigue, and if untreated can have serious health and wellbeing consequences. He has referred her to a local sleep clinic.

**Goals:** To improve her English.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | X | . | . | . | *cautious* |
| *organised* | . | X | . | . | . | *careless* |
| *outgoing* | . | . | X | . | . | *reserved* |
| *friendly* | X | . | . | . | . | *challenging* |
| *sensitive* | . | X | . | . | . | *confident* |

**Technology**

Broadband access: Yes Smartphone: Yes

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | . | X | . | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | X | . | . | . | *high* |

**Scenario:** The specialist at the sleep clinic initially suggested that Rosa might go and stay in a sleep lab in Oxford for a few nights so they can make some observations and run some tests. Rosa is not so keen on spending time away from home, so instead the clinician has proposed that she takes one of their new remote-testing kits home with her. The kit consists of a number sensors that are attached to various parts of the body before going to sleep to measure oxygen levels, brain activity, heart rhythm, etc. as well as video and audio recording her while she sleeps. The data from the various devices will all be transmitted back to the sleep clinic. Rosa feels a bit uneasy about this and says she will think about it and talk to her husband. Later that day, Rosa finds an app on the app store called SleepSoundz which claims to diagnose sleep apnoea from the sound of your breathing while you sleep: you simply start the app and leave it running next to your bed at night, and in the morning you get the result.

What do you think Rosa should do? Would you use the home-testing kit from the sleep clinic? Would you use the SleepSoundz app?

# Scenario 5: Sarah

**Biography:** Sarah is 48 years old and lives alone since her divorce 12 years ago. She had a good job as an accountant until the deteriorating state of her health meant that she had to leave her position 18 months ago. She lives in a flat in a suburb of Manchester, and although she has a good number of friends, not many live nearby.

**At a glance**

| | |
|---|---|
| *Age:* | 48 |
| *Location:* | Manchester |
| *Family status:* | Divorced, no children |
| *Education:* | Degree-level |
| *Employment status:* | Unemployed |

**Health:** After a long period of ill health and general fatigue, Sarah was diagnosed with multiple sclerosis 9 years ago. She has been able to continue with many of her usual activities, although now she can walk only with the aid of a stick and finds that more and more often she has days when she is tired and lacks the motivation and strength to leave the house.

**Goals:** To maintain her independence.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | . | . | X | . | *cautious* |
| *organised* | . | X | . | . | . | *careless* |
| *outgoing* | . | . | . | X | . | *reserved* |
| *friendly* | . | X | . | . | . | *challenging* |
| *sensitive* | . | X | . | . | . | *confident* |

**Technology**

Broadband access: Yes Smartphone: Yes

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | . | X | . | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | X | . | . | *high* |

**Scenario:** Sarah has already had some modifications made to her flat. She has had grip bars installed in the bathroom along with an easy-access bath. She is now thinking of having some 'smart home' technology installed. In particular, she likes the idea of being able to remotely control the lights, the curtains, and the heating in the flat. Also, she likes the idea of a smart doorbell, which would allow her to see on her tablet or smartphone who is at the front door and let them in on the press of a button. She finds it increasingly difficult to insert her keys into the door lock, so the use of a smart lock that would allow her to unlock her flat using an app is appealing, but she is not sure how safe it would be. Also, she finds it increasingly difficult to use conventional apps on her tablet and phone, so she likes the idea of controlling everything using a voice-activated 'smart speaker' like Amazon Alexa, even possibly using this to call for assistance if necessary, but again she is not sure about this.

Do you think Sarah's ideas are good? What advice would you give her? What else does she need to consider?

# Scenario 6: Karen

**Biography:** Karen lives alone in a modernised farmhouse in a small village in Cumbria. She works as a freelance editor and supplements this with part-time work in a local grocery store. In her spare time she volunteers in a charity café in Keswick, the local town, and enjoys creative writing and walks over the fells with her sheepdog Bessie.

**At a glance**

| | |
|---|---|
| *Age:* | 54 |
| *Location:* | Cumbria |
| *Family status:* | Single |
| *Education:* | Degree-level |
| *Employment status:* | Employed |

**Health:** Five years ago Karen was diagnosed with age-related macular degeneration. In the time since then her eyesight has noticibly deteriorated: the dark spots in her vision have enlarged; she now finds reading difficult (which makes her work increasingly time-consuming); she's more sensitive to bright light; and has begun to find moving about challenging and sometimes disorienting, especially in traffic and busy places.

**Goals:** To finish writing her novel this year.

**Personality**

| | | | | | | |
|---|---|---|---|---|---|---|
| *curious* | . | . | X | . | . | *cautious* |
| *organised* | . | X | . | . | . | *careless* |
| *outgoing* | . | . | . | X | . | *reserved* |
| *friendly* | . | . | . | X | . | *challenging* |
| *sensitive* | . | . | . | X | . | *confident* |

**Technology**

Broadband access: Yes Smartphone: Yes

*internet usage:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | . | . | X | *high* |

*technology comfort:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *low* | . | . | X | . | . | *high* |

**Scenario:** One of Karen's friends has sent her some information about a system developed by a US company that is intended to help people with a visually impairment safely navigate towns and cities. It consists of digital beacons that can be placed anywhere, and a downloadable smartphone app. When someone with the app on their phone approaches a beacon, it sends them an alert over Bluetooth along with a voice message. This message might contain, for example, a description of the current location, or the services within the adjacent municipal building or shop, or the number and time of the next bus to arrive at this bus stop. The message is read aloud by simply pressing a button on the app. Beacons can also be attached to pavement furniture and temporary obstacles such as barriers around roadworks. Karen likes this idea, which would help her to move around Keswick. She has sent an email to the local town council to urge them to install this system for her and other local people with visual impairments.

Do you think this is a good idea? In Karen's place would you use such a system? Should the town council install it? What should inform their decision?