

FUTUREquipped

ICT Sector

Automated Medicine Alert System
in a SMART Home

UNIT

2

Funded by:



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Promoting further and higher education

Designed and delivered
in collaboration by:

CONSTRUCTION
SCOTLAND
INNOVATION
CENTRE



DIGITAL
HEALTH & CARE
INSTITUTE

Learning outcome

Identify how smart technology can help people to regulate their medicine intake by creating a reminder alert.



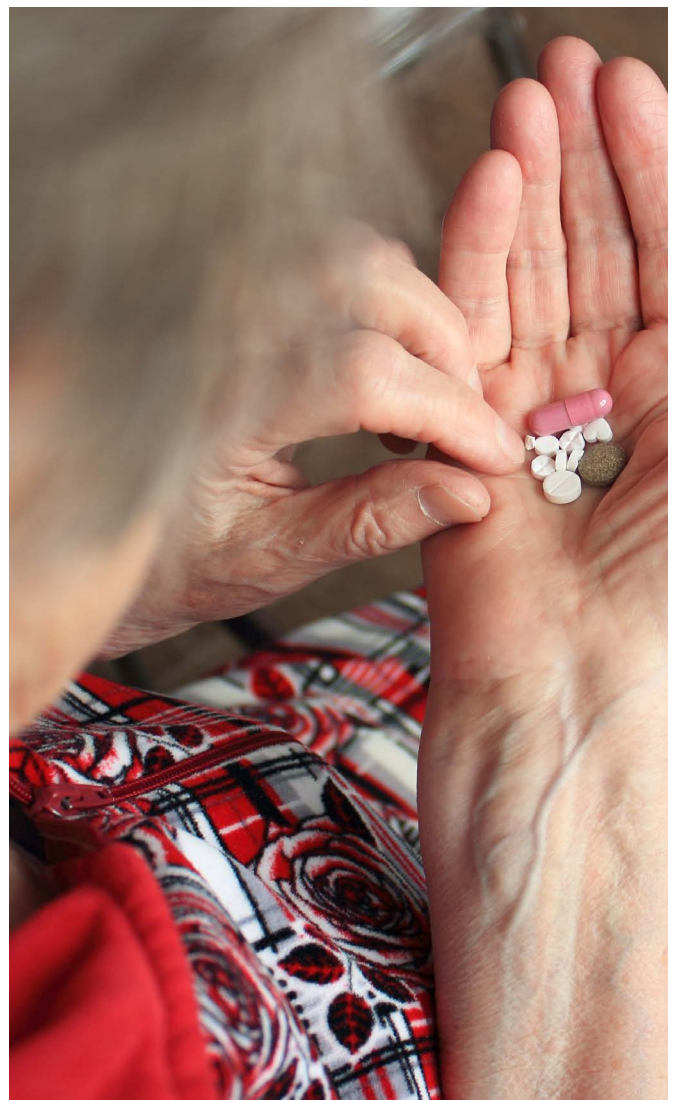
Automated Medicine Alert System in a SMART Home

Introduction

This topic will introduce learners how software can aid a person's individual living by ensuring that they are reminded when, and what medicine to take. The issue of people not remembering to take their medicine correctly can be the difference between life and death (ScienceDaily, 2010).

To discover how technology can be used to resolve the problem, you will look at what part an app can play in aiding medicine taking.

The failure to correctly self-administer medication is a huge problem worldwide and not one that can easily be fixed, but technology can help. However, it is important to remember confidentiality. "Although the person you care for may appreciate your support with their medicines, bear in mind that they have a right to confidentiality." (nhs.uk, 2018).



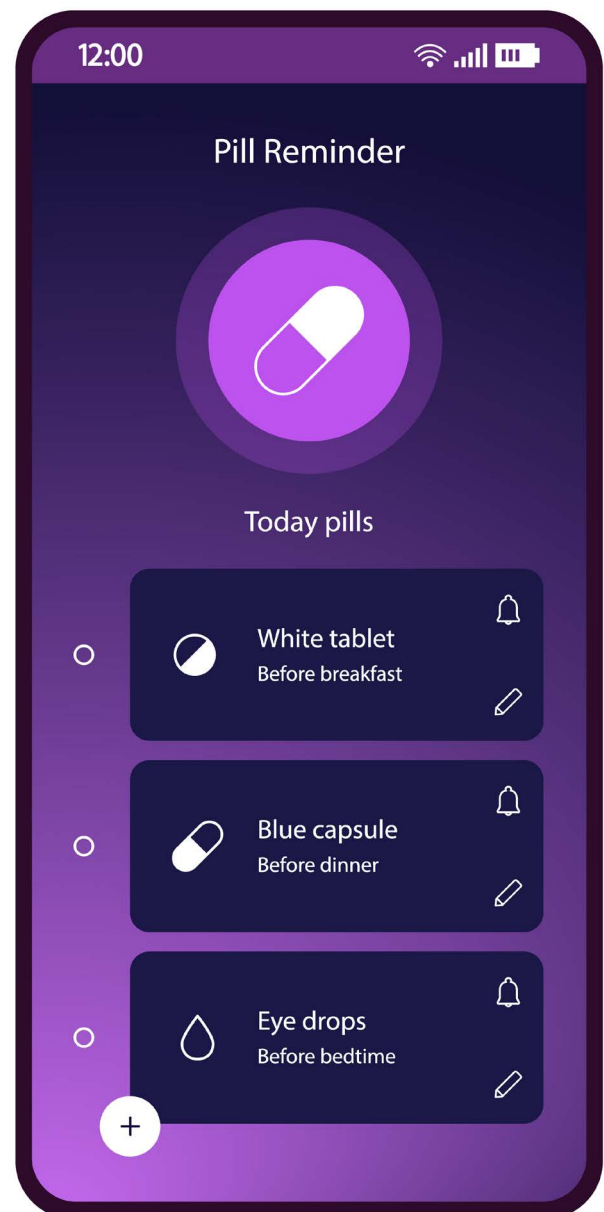
Key drivers for the emergence of Automated Medicine Alert Systems in a SMART Home, now and in the future

This failure to correctly self-administer medication is a huge problem worldwide. The key drivers for this activity are the growing figures in which people forget to take medication. A poll carried out by Epilepsy Research highlights that, “almost 50% of people forget to take their medication at least once a month.” (Epilepsyresearch.org.uk, 2017).

Therefore, facilitating people to ensure correct medication administration will help relieve the pressure on both carers and the NHS.

Key players in the development and implementation of Automated Medicine Alert Systems in a SMART Home

Key players in this activity include the person who requires help in self-medicating and the health board that oversees their care. Key players include also SMTs and large technology corporations, who develop these technologies.



Which Scottish Innovation centre is most closely linked to this theme?

The [Digital Health & Care Institute](#) brings together people and organisations in the health and social care, charity, technology, design and academic sectors to develop new ideas for digital technology that will improve the delivery of health and care services for the people of Scotland.

The use of modern technologies and digital services is not only changing the way we

communicate, they also offer us more innovative ways for monitoring our health & well-being, giving us greater access to personal data for self-management.

Together these advancements lead us to a convergence of information, technology, people and connectivity which can improve health and care outcomes.



Key challenges and opportunities for the development / adoption / progress

The key challenges that need to be met is to ensure that people take the correct medication at the correct time, and do not put themselves at risk by not doing so.

- Many elderly patients are on several medicines, each with its own dosing schedule cannot keep track of what they should be taking and when.
- Others feel that if they have no current symptoms, then there is simply no need to take medicine. Waiting until you feel bad, then the take pills seems to be the predominate thought.
- Some patients with visual impairments can find it difficult to read the labels and therefore don't take their medicine for fear they are doing it incorrectly.

However, the adoption of a digital service would allow the person to self-manage their medication. There are many ways someone might be alerted and guided to take their medication – either by an app, a voice assistant or smart pill box. The medicine adherence data can be linked to their other SMART Home data – showing them that they may be more mobile or sleep better when they take their medication.

Additionally, this gives the responsibility back to the person requiring the medication and provides them with a better sense of wellbeing. It also takes the pressure off the carers as they know that the medication schedule is being taken care of.

Together these advancements lead us to a convergence of information, technology, people and connectivity which can improve health and care outcomes.

Case study

highlighting best practice and emergent trends

“Research by LloydsPharmacy found that 44% of people taking medicines suffer side effects that they could avoid.” (Proctor, 2019). People often forget to take medicines for a variety of reasons:

- Being busy or distracted at the time they usually take them.
- Having a change to normal daily routine.
- Having new tablets but yet to establish the habit of taking them.
- Something significant is causing them to be anxious and disrupting clarity of thought.

To resolve this, a basic app is required that will create a timer to alert the patient when they should take their pill. The app will also show them an image of what pill to take and display a message if the timer hasn't been stopped which highlights that the medication has not been taken.

You have a choice in how you proceed with this activity. If you want to make a basic app that solves these issues, then go to:

<https://www.dropbox.com/s/t39abrjo9ykcb4x/Medicine%20App%20Instructions.pdf?dl=0>.

The files you will need to make the app can be found here:

<https://www.dropbox.com/s/skrp32axekc6lf5/medicine%20app%20files.7z?dl=0>

If you want to just install the app on your phone, then download the medicineAlarm.apk file <https://www.dropbox.com/s/papklz9lt3zob64/MedicineAlarm.apk?dl=0> and install it on your android phone.

This app is not the finished product but starts the journey to introducing this technology to residents of the SMART Home village.

It is important when building apps that the user is at the centre of your design issues so that it is fit for purpose.

<https://www.usability.gov/what-and-why/user-centered-design.html>

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STUDY ROOM

LIVING ROOM

DINING ROOM

DEPOSIT

LAUNDRY ROOM

KITCHEN

HOUSEKEEPING ROOM

FA



Assessment 1

Multiple Choice Assessment

- 1. According to epilepsy research what is the percentage of people who forget to take their medicine once a month?**
 - a. 10%
 - b. 25%
 - c. 50%
 - d. 85%
 - 2. People often forget to take their medicines because:**
 - a. They have just been put onto the tablets and have yet to establish the habit of taking them.
 - b. No one told them to take them.
 - c. They don't want to take them.
 - d. They never forget to take them.
 - 3. According to the NHS, if the person you care for has a complicated medication regime with different pills taken at different times of the day, what should you do?**
 - a. Take them home with you so that they cannot take the incorrect medicine.
 - b. Ask your pharmacist to provide them in dosette boxes.
 - c. Make sure the medicines are all stored in the same box.
 - d. Assume the person will be capable of managing their own medication.
 - 4. Who should be at the forefront of application design?**
 - a. The user.
 - b. The developer.
 - c. The designer.
 - d. The manufacturer.
 - 5. Each person has a right to confidentiality when it comes to their health and medicines. Who is responsible for deciding how much of their information should be available to their carer?**
 - a. Doctor.
 - b. Nurse.
 - c. Pharmacist
 - d. Them.
 - 6. Do changes in daily routines make it more likely that people will forget to take their medication?**
 - a. Yes
 - b. No
 - 7. Technology can help people remember to take the correct medication?**
 - a. True
 - b. False
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8. *Taking the incorrect medication or forgetting to take it can stop a medicine working or cause side effects. What would be the best way to avoid this?*

- a. Not prescribe any medication.
- b. Assume the patient will remember.
- c. Create a mobile app that would remind them.
- d. Provide round the clock care for everyone.

9. *Living in a SMART Home with technology all around would allow people to live independently longer?*

- a. True
- b. False

Assessment 2

Project Based Assessment

Using the alarm app, you are required to test the usability from the perspective of a person who may suffer from a range of disabilities or conditions.

The basic app should:

- Create a timer that will alert the patient when they should take their pill.
- Show them what pill to take.
- Show a message if the timer hasn't been stopped to highlight that the medication has not been taken.

Task

1. Using the medicineAlarm app identify if all of these requirements have been met.
2. From a User Centered Design standpoint is the app easy to use?
3. If there are issues with the design of the app what suggestions would you make for its improvement?



Assessment 1 Answers

- 1 c. 50%
- 2 a. They have just been put onto the tablets and have yet to establish the habit of taking them.
- 3 b. Ask your pharmacist to provide them in dosette boxes.
- 4 a. The user.
- 5 d. Them.
- 6 a. Yes
- 7 a. True
- 8 c. Create a mobile app that would remind them.
- 9 a. True

These materials were produced by college lecturers as part of the FUTUREquipped project in 2018. The project was funded by the Scottish Funding Council and designed and delivered in collaboration by the Digital Health and Care Institute and the Construction Scotland Innovation Centre.

Digital Assets

medicineAlarm.apk App

<https://www.dropbox.com/s/papklz9lt3zob64/MedicineAlarm.apk?dl=0>

App instructions

<https://www.dropbox.com/s/t39abrjo9ykcb4x/Medicine%20App%20Instructions.pdf?dl=0>

Required files

<https://www.dropbox.com/s/skrp32axekc6lf5/medicine%20app%20files.7z?dl=0>

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