



# FUTUREquipped

## Health and Care Sector

Introductory booklet - SMART Homes and how the provision of care is changing

UNIT

1

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CONSTRUCTION  
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INNOVATION  
CENTRE



DIGITAL  
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# Learning outcome

Develop an understanding of how SMART Homes enable individuals to live purposely, safely and autonomously at home.



# Overview of SMART Homes and Smart technology in Care

## Introduction

**A** SMART Home/House is one in which a network of sensors and interconnected devices are employed to monitor and respond to various environmental conditions. Initially conceived from the desire for convenience, security and energy efficiency, SMART Home concepts are now being applied in the context of supported living; enabling those in need of care to lead more autonomous and fulfilling lives.

Sensor technology sits at the very beginning of the SMART Home value chain, with sensors enabling the capture and dissemination of various data which, when integrated with the appropriate control systems, can enable an appropriate “action, reaction or interaction”.

The use of smart technology allows unobtrusive adaptations to be made within the home which collect relevant data that on analysis provides the Care Sector with an insight into an individual's behaviours e.g. sensors that detect the cooker has been left on will shut off the device remotely. The use of sensor technology will aid development of strategies designed to keep the individual safe and independent. Collaboration between Construction, Information Technology and Care sectors will further aid development within the SMART Home sector. The use of magnetic switches, infrared motion sensors and pressure sensors enable the environment to be monitored unobtrusively allowing the individual's privacy to be respected.

Due to the aging population within Scotland the future provision of care requires to change radically in order to maintain the standard currently being provided by Health and Social Care Partnerships. Staff across the Care sector will require training and support in the use of Smart technology to assist with the facilitation of person centred care.

The role of technology is not to replace the carer but to enhance the care provision.

With the ever-changing face of healthcare, it is imperative that as care professionals we not only keep up-to-date with best practice in medical interventions but also in the fast-paced sector of digital technology. It is estimated that by the year 2020, there will be 20-30 billion devices and possibly even more sensors connected to the internet. SMART Homes in their infancy were the way forward in allowing a more efficient way to run homes. Borne out of this was the realization that they could be adapted to clear the path for independent living. <https://www.digitalistmag.com/iot/2018/03/02/enabling-20-billion-devices-through-internet-of-things-05944011>

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There are numerous practical examples of how sensor technologies can be applied in a SMART Home context, as outlined in the table below.

Sensor Type	Application(s)
Motion	<p><b>Activity Monitoring</b> (remote tracking/monitoring - notification of abnormalities to allow for intervention)</p> <p><b>Security/Safety</b> (intruder alarms)</p>
Temperature	<p><b>smart thermostats</b> (ensuring efficient management of heating in the living environment)</p> <p><b>Safety</b> (fire alarms, safety cut-offs in kitchens and bathrooms)</p>
Moisture	<p><b>smart thermostats</b> (ensuring efficient management of heating in the living environment)</p> <p><b>Safety</b> (fire alarms, safety cut-offs in kitchens and bathrooms)</p>
Pressure	<p><b>smart thermostats</b> (ensuring efficient management of heating in the living environment)</p> <p><b>Safety</b> (fire alarms, safety cut-offs in kitchens and bathrooms)</p>

We must be aware that individuals and their family must be consulted and consent given in order to safeguard who has access to the data that is generated from assistive technologies.

The purpose of the Care Micro Learning Units is to raise awareness of the impact new technology has in creating a safe environment for people, regardless of their diagnosis, to remain in their own homes rather than move into care.

Click on the link below to find out more about assistive technologies.

<https://careinfoscotland.scot/topics/care-at-home/equipment-and-adaptionstelecare/>

STUDY ROOM

LIVING ROOM

DINING ROOM

DEPOSIT

LAUNDRY ROOM

KITCHEN

HOUSEKEEPING ROOM

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# An overview of the key drivers for the topic/theme's emergence, now and in the future

It is important that individuals working within the sectors of Construction, IT and Care understand what the key drivers are behind SMART Homes.

The following are a sample of the key drivers behind the need for SMART Home development in relation to the Care Sector in Scotland:

- **NHS 2020 Vision:** the key aim is that people living in Scotland will live longer, healthier lives at home or in a homely setting. <http://www.central.knowledge.scot.nhs.uk/Leadership/20-20-vision.html>
- **Life Expectancy:** Life expectancy is on the increase. "Over the last century our health has improved. There have been long term increases in average life expectancy in Scotland and we have seen considerable improvements in the overall health of the population" (Public Health, 2018). This has resulted in a drain on Social Care budgets as people wish to continue to live in their own homes for as long as possible. <https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2018/06/scotlands-public-health-priorities/documents/00536757-pdf/00536757-pdf/govscot%3Adocument>
- **Reduction in budgets for Social Care sector:** as a society we need to be creative and flexible in the way care is provided. The number of individuals and service providers who are now looking at and using assistive technology to reduce budgets is on the increase.
- **Scotland's Digital Health and Care Strategy:** shows how the Scottish Government aim to use technology to reshape and improve services, support person-centred care, and improve outcomes. Click on the link to download and to read the strategy: <https://www.gov.scot/publications/scotlands-digital-health-care-strategy-enabling-connecting-empowering/>
- **Health and Social Care Standards - My support, my life.** Entitles everyone to expect high quality care and support tailored towards their particular needs and choices regardless of where they are living including within the home. Click on the link to download a copy of the Standards to find out more: <https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2017/06/health-social-care-standards-support-life/documents/00520693-pdf/00520693-pdf/govscot:document/?inline=true/>

# Who are the key players in SMART Homes and what is their role / interest / level of influence?

It is equally important to understand who the key players will be in relation to SMART Homes/smart technology. The following are examples of key groups who will be involved:

- **Health and Social Care Partnerships:** delivering integrated care, sharing the cost of community care reduced bed blocking in hospitals, which will have an impact on the availability of inpatient beds. More coordination of health and care services and remote monitoring mean more groups across society can benefit from these services.
- **Scottish Government:** integration of health and care services reduces budget costs which enables redistribution of funds to respond to demand as the numbers of individuals living with dementia and other long term conditions increase.
- **Innovation Centres:** create opportunities to work across sectors of industry to develop and deliver products/services that build a safer/autonomous service for those vulnerable in the society.

The three key players above will be enabled to become proactive rather than reactive in response to steady flow of real-time patient/citizen generated data. They will also be able to provide

in-depth analysis of data obtained from smart devices in individuals' homes, which can be used to develop and improve strategies and create reactionary responses to individuals' needs only as and when required (as opposed to routine responses).

Click the link to find out more about the importance of data: <https://youtu.be/0nGMTxi0a5s>

- **Service Users:** can remain in their own homes, and as part of their community and social groups for longer. Safety devices embedded within their home reduce risk factors considerably, creating a safe environment for the resident. Services can get involved in the planning and evaluation of care services.
- **Formal Carers:** are left with more time with those requiring assistance. They remain comfortable in the knowledge that technology will alert them should an incident occur, and can provide more effective proactive response to care.
- **Informal Carers/Family:** feel more involved in and more connected to a loved one's care regardless of location. Reassured that if anything should happen, early detection is available.

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# Scottish Innovation Centres most closely linked to Health and Care?

- **Digital Health & Care Institute (DHI)** - the innovation centre for digital health and care,

where, among other things, technology is being developed to enable individuals to monitor their health conditions in a non-intrusive way. This enables the analysis of data gathered to provide a true picture of the individual's condition and the creation of a person-centered approach rather than "a one size fits all".



- **CENSIS** - the innovation centre for sensor technology. Sensor technology in SMART Homes can provide for care providers and informal carers a depth of information never seen before, e.g. how many times an individual with dementia paces the floor overnight, or if they leave their home and return within a set time. Data gathered from motion sensors can help facilitate fall prevention.
  - **The Data Lab** - the innovation centre for data science where the data produced from projects like SMART Homes can be analysed. The results provide real-time information on an individual's behaviour patterns and physiological measurements to enable the care providers to create person-centered care using the most up-to-date information. The data will also provide real-time information in emergency situations, e.g. if an individual has fallen and has not moved in some time.
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# Identification of the key challenges and opportunities for the development / adoption of Smart technology.

## Key challenges

- Coordination/communication between Data Analyst /Carers/Family and Care Manager need to be robust
  - Financing adaptations to home
  - Financing new build SMART Homes
  - Analysis of data actively used to create/amend Care Packages (Care Plan)
  - Finance for staff training/upskilling
  - Finance for staff cover to allow others to attend CPD
  - Finance for informal carer training
  - Availability of time for training
  - Cyber security - IT safeguards for data gathering and monitoring: procedures must be robust to ensure data security and legal compliance
  - What happens to data produced?
  - Gaining permission to use data if individual unable to grant due to incapacity
  - Who will pay for Power of Attorney/Guardianship?
  - What happens to data once service user no longer in their own home?
  - Possible decrease in social interaction
  - Reluctance of older adults to access/engage with technology
  - Dilemma between protection of service users from harm and the use of the data collected
  - The decision for intervention to protect service users (restriction on their freedom)
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## Key opportunities that are currently available

Collaboration between construction, data analytics, health/ social care and the Innovation Centres creates exciting and innovative possibilities for individuals living autonomously in their own homes.

Upskilling of health and social care staff to use and understand digital technologies to enhance/develop new skills.

Appropriate technologies already available on the market:

- Amazon Alexa  
<https://alpinehc.co.uk/blog/amazon-alexa-elderly-disabled-hampshire-live-independently/>
- Telecare packages run by local councils
- GPS tracking devices
- iPad/tablet technology most individuals using these now
- My Home Helper <http://www.myhomehelper.co.uk/extra/mhh-brochure-2018.pdf>
- Most people these days have mobile devices so have prior knowledge of software
- Families may feel more involved in care even from a geographical distance



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# SMART Homes and Care

## **Unit 2 Smart technology: Living independently with sight loss**

**Outcome:** Developing an understanding of the use of Smart technology in maintaining independent living for individuals with visual impairment.

## **Unit 3 SMART Homes: Living at Home with Dementia**

**Outcome:** Developing an understanding of how SMART Homes enable people with dementia to live purposely, safely and autonomously at home.

## **Unit 4 SMART Homes: Supporting Adults with Mental Health Issues**

**Outcome:** Understanding and identifying how digitally enabled technology

## **Unit 5 SMART Homes: Safeguarding individuals whilst maintaining dignity and privacy**

**Outcome:** Consider the dilemmas between the protection of service users and the use of technology to support independent living.

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# Resources:

Care Information Scotland. (n.d.). Equipment and adaptations/telecare | Care Information Scotland. Retrieved April 10, 2019, from <https://careinfoscotland.scot/topics/care-at-home/equipment-and-adaptionstelecare/>

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