

Nexus TV paper



Assistive Living through Technology – Can it help care communities?

Introduction

The purpose of this paper is to highlight the topic and issues in relation to the emerging trend of an ageing population. It will explore how technology will assist the care community in responding to the growing needs of an ageing population.

The population of the UK is ageing and growth in the number of older people as well as the rise in cost of healthcare is putting significant pressures on the Government, NHS and other health and social care providers. One of the most prominent challenges in the coming decades will be the need to provide high quality, cost-effective care for increasing numbers of older people. With the trend of higher life expectancy, there are new responsibilities for the NHS and social care to help older people to remain as healthy, active and independent as possible. The introduction of assistive technology into modern life will become a necessary step towards improving the lives of the elderly, the impaired and the disabled.

If this is to happen and be a successful way forward, the following sample questions need to be addressed:

- What impact is an ageing population having on society?
- What are the challenges facing the NHS and other health and social care providers?
- In what ways will assistive technology benefit the elderly, the impaired and the disabled?
- What part will Nexus TV play in the assistive technology sector?
- Can new technology provide an enhanced lifestyle?
- Will assistive technology produce cost savings?

The purpose of this paper is to highlight the challenges that face the NHS, social care organisations, local and central government, and how assistive technology could help to overcome some of these problems.

The NHS

In 1948, when the NHS was founded, 11 per cent of the UK population was 65 or over; in 2008 that figure is 16 per cent. It is expected that in 2028 this figure will be over 20 per cent.¹ Currently 34% of the population are over the age of 50.² Global ageing demographics have serious financial implications for policy and funding of social and healthcare services around the world. The average overall cost of health care, due to ageing alone, is expected to increase by 41 per cent between 2000 and 2050.³ Even with medical advances and prolonged life expectancy health experts believe the number of people suffering from debilitating conditions such as dementia, cancer and heart disease is increasing and will cause a rising demand for nursing care. Current trends suggest that living longer means

living longer with ill health. Between 1981 and 2002, the years living with ill health for men increased from 6.4 to 8.8, and for women from 10.1 to 10.6.⁴ Medicine is capable of saving lives; however it also acts as a safety net to correcting a lifetime of unhealthy lifestyle choices, such as alcohol, drugs and over-eating. Patients' needs are changing as a result of their lifestyle choices. There is a need for people to be educated into understanding how to monitor their own conditions. Only 24% of Accident & Emergency attendances are admitted to hospital,⁵ which implies that individuals visit hospital with minor complaints that do not necessarily need hospital treatment.

Care homes

Preparing care homes to meet the needs of elderly people is essential and with an increasing number of individuals needing around the clock care, it is likely that care homes are already feeling the strain of this increase. The concern is that as people age, they become less active and unable to carry out everyday activities, increasing the likeliness of becoming prone to debilitating conditions associated with old age. The Care Quality Commission (CQC) is the independent regulator of health and social care in England and it aims to make sure better care is provided for everyone – in hospitals, care homes and people's own homes. In a report last year, inspections carried out in care homes by the CQC highlighted concerns over staff supervision, health and safety, and the way that medication is handled. One in five homes failed to provide adequate activities and opportunities for residents to socialise.⁶ The use of assistive technology would ease these pressures by providing necessary training for health care professionals at the touch of a button and also assisting social networking and activities for the residents through online communities both within the home and outside of it.

Local Councils and Housing Associations

As public spending is cut, councils face the uncertain future of funding and the financial struggles posed by an ageing population. Michael O'Higgins, chairman of the Audit Commission, said: "There are huge financial pressures on councils in the years ahead, but redesigning services and exploiting technology can make them better, more efficient and more personal."⁷ A scheme known as Very Sheltered Housing (VSH) provides older people primarily over 65, with 1 and 2 bedroom flats, which forms part of a complex that incorporates communal facilities, such as a restaurant, activity rooms, lunch clubs and a hairdresser. The aim of local councils with this scheme is to keep older people living independently within their own homes for longer. Figures from 2007 show that in Great Britain, 30 per cent of women aged 65 and over lived alone compared to 20 per cent of men in this age group; and for those aged 75 and over this increases to 61 per cent and 34 per cent respectively.⁸ It is unfortunate that many elderly people that live on their own become isolated and afraid, and although local councils and housing associations are trying to

promote staying in the home with schemes like the VSH, lack of feeling secure is a contributing factors towards individuals becoming vulnerable and isolated. For example, recent reports claim that Police forces in England and Wales are failing to take antisocial behaviour seriously and urgent action must be taken to improve understanding of the toll it takes on communities.⁹ Fear of the younger generation is a common issue for elderly people that live alone.

Isolation among the elderly has been made worse by the increasing number of couples breaking up. A report for the Institute of Public Policy Research said the rising number of aged and the tendency of women to outlive their husbands are also contributing to people's depression and unhappiness.¹⁰ After a partner dies, individuals may find themselves living alone for the first time, with little understanding of where to access the care and support that they require especially if they have limited communication with family members. Help the Aged annual report 2009 has highlighted that losing a partner can cause elderly people to lose their confidence. Once this confidence is lost, fear can often set in – fear of going out alone, of crime, of falling and even of young people. When older people become detached from their own communities in this way, their lives become more confined, social interaction is reduced and loneliness and isolation grow.¹¹

Cost savings

In a recent report by the CBI, it was stated that more care could be delivered at home or in the community, and by a range of different providers. This would reduce the number of costly hospital admissions and could save around £15bn by 2015.¹² By giving people more choice about how and where they can be treated, it would mean that patient problems could be assessed remotely in the comfort of their own homes, thus easing the pressure on hospital wards and doctors surgeries. It will also reassure patients that a visit to the hospital or doctor is not always necessary because symptoms can be monitored from their homes. In a speech on the NHS reforms in January 2008, the Prime Minister Gordon Brown discussed a change of emphasis to prevention rather than cure, and the need to ensure the NHS benefits from new and innovative technologies.¹³

Assistive Technology

The term 'assistive technology' refers to '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.'¹⁴

Technological developments are helping to make people's lives easier and more fulfilling particularly for the elderly, impaired and disabled. A well-known example is the term 'telecare' used to describe sensors or detectors that are able to detect gas, smoke, water or

a person's fall. Hazards such as these will send an alert to a community service that can then respond. The use of assistive technology such as this means that people that do not require 24-hour assistance (provided by a nursing home or hospital) but for whom independent living is no longer suitable, can still keep their independence by living in an assisted living environment with remote monitoring to ensure that an individual's health, safety and well-being is maintained. Assisted Living is a positive means of managing the increasing demand of people that have long-term conditions and disabilities.

Remote Patient Monitoring - Safety Critical Systems

Chronic disease is becoming increasingly prevalent amongst the older population, making it necessary for them to be managed more effectively and efficiently. Home Telemonitoring is gradually extending its margins towards systems that are safety critical in terms of monitoring vital life signs of acute illness and potentially saving lives. This standard of technology is seen to offer a crucial solution for life threatening illnesses, particularly if it means reducing hospital admissions by monitoring the patient in their own home. Remote monitoring can be as straightforward as measuring a person's weight, temperature, or carrying out more advanced checks such as the patient's ECG, blood pressure or INR of the blood.

Data Integrity & Communications

The gathering of information to monitor an individual's everyday health remotely has certain risks attached to it. For example, when transmitting data back to a central repository, it is crucial that the information sent arrives successfully and accurately, especially if the results have a direct impact on the patient's immediate health. It is also important that the patient plays an active part in monitoring their own health, for example remembering to weigh themselves and then communicating the results to the GP. Even with these risks, however, comes the overriding expectation that safety critical systems will become a reliable and successful way of saving lives and public funding in the long term.

Interoperable Standards

From a technological perspective, interoperability between personal telehealth devices (for example the set-top box) and the monitors (for example a blood pressure monitor) needs to be met. The framework of standards, through organisations such as the Digital Living Network Alliance (DLNA) and Zigbee, is being developed to ensure that patients can connect to different devices seamlessly and through a single point of delivery. Security is also important especially when dealing with confidential patient data. These are some of the

emerging challenges, which need to be met and agreed by industry standards groups, public sector organisations, The NHS, commercial corporations in order to meet the requirements of the consumer.

Nexus TV

Nexus TV is an enhanced TV solution based around digital television with a low cost set-top box (STB), internet connectivity and a remote control; devices that are familiar to everyone. (See Figure 1 below.) Nexus TV will offer independence, support, monitoring and security to the elderly, impaired and disabled in the comfort of their own home, acting as a 'virtual care home' for them. It can also provide key training for carers at the touch of a button. It utilises assistive monitoring to provide the following example applications:

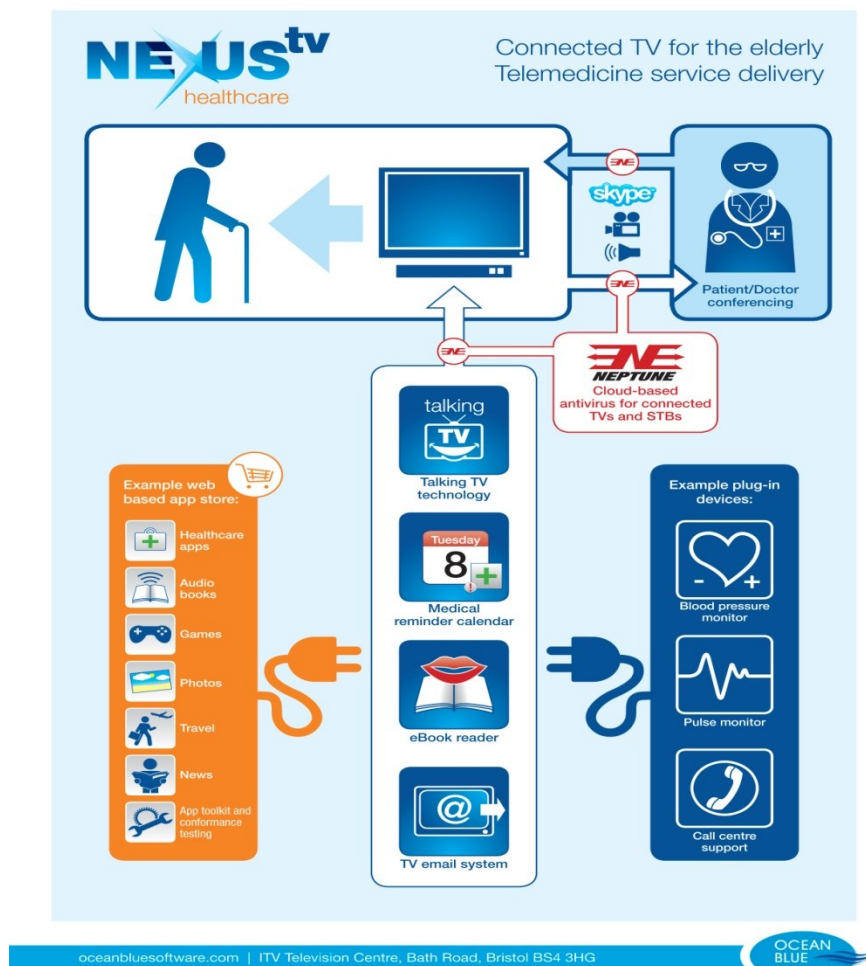


Figure 1: nexus TV model.

Assisted Living Examples

Health monitoring – The set-top box has been designed with wired connectivity via a USB port and wireless allowing a variety of monitoring equipment to be used in either passive or active ways. A calendar could be used to prompt users to take their blood pressure (with the results being sent back automatically via IP connection). Alternatively Nexus TV could take readings from passive sensors that the user wears or that could be placed discreetly in the home to detect movement, alert to a fall or detect a person leaving their home.

Calendar functions – A core calendar could keep users updated on appointments with local agencies or visits from other services, as well as welcome reminders about prescription medicines that need to be administered. The calendar would be administrated from a local centre or in association with the relevant medical centre/GP surgery, with users being offered the additional comfort of a bar-code scanner which could be incorporated within the TV remote control to validate correct medications and prescribed timings as well as order repeat prescriptions.

Virtual Village - Ocean Blue are developing a virtual village, via the TV and an internet connection, this will provide an interactive message board linked to other members of the community with whom they would like to keep in touch and a way to meet other like minded people. This also includes a local community notice board, advising users of relevant events, news, travel services and weather.

Entertainment services - Includes Freeview digital TV, talking TV guides and menus, and downloadable audio books. The portal can supply a variety of relevant content depending on the user and the type of access that they have. It is expected that Nexus TV would provide a wide range of core content for free, but envisage that a subscription-based service could also allow users access to a wealth of additional content, such as shopping partners, more audio books, quizzes & online games.

Video phone – Users will be able to see which other members of the Nexus TV community are also 'switched on' and would be able to 'video call' these friends and neighbours. The development will need to capture a user tracking system, as well as a simple way for users to change their 'status' should they wish to appear on- or off-line.

Alert function – A direct link to a real person in a call-centre via a video link gives valuable support to vulnerable people in the event of an emergency. A 'panic button' function could also be incorporated into the Nexus TV.

Door camera with remote support – Nexus TV can be deployed with a webcam that will display visitors at the front door to the user on the TV. The system will also allow the user to

talk to the visitor without opening the door, via a video-phone link, and will allow them to forward the link to call centre staff to interview the visitor remotely and to discuss directly with them the purpose of the visit before agreeing entry with the householder.

Protection via Door Alert

The door camera in particular aids the vulnerability of the elderly, impaired, and disabled and means that individuals will have the option to accept or decline the caller from entering. This will greatly reduce the risk of an intruder or an unwanted visitor entering. It also brings reassurance to those that feel vulnerable by enabling them to have control over who enters their home, especially with the increasing number of elderly people at risk from bad selling practises.

Michele Shambrook, of Consumer Direct, says: “Many of these products (mobility scooters, bath aids and Orthopaedic furniture) are sold to people in their own homes, where they can be particularly vulnerable to high-pressure selling techniques. Some companies even falsely claim to be working for social services or a government department.”¹⁵ Nexus TV will also have the ability to recommend official, honest companies to make purchases not only for the above but also when using local amenities such as taxi services, meals on wheels, dog walkers, and personal shoppers. This will reduce the risk of less capable individuals being taken advantage of and feeling pressured into purchasing unnecessary, excessively priced items through doorstep selling.

Nexus TV is expected to provide assistance to a variety of different services and people, such as families with elderly or disabled relatives, independent care homes and sheltered accommodation. As the usage of Nexus TV increases this will also have a positive impact on carers and support staff within the NHS by reducing the care and money needed to maintain and support a growing population.

How will this be paid?

Figure 2 below is a diagram highlighting example business models which could be utilised to support & pay for this assistive solution. Examples include:

- Rent the set top box, including support, for a monthly charge
- Generating revenue via the Information portal
- Downloadable applications to the set top box.
- Advertising.

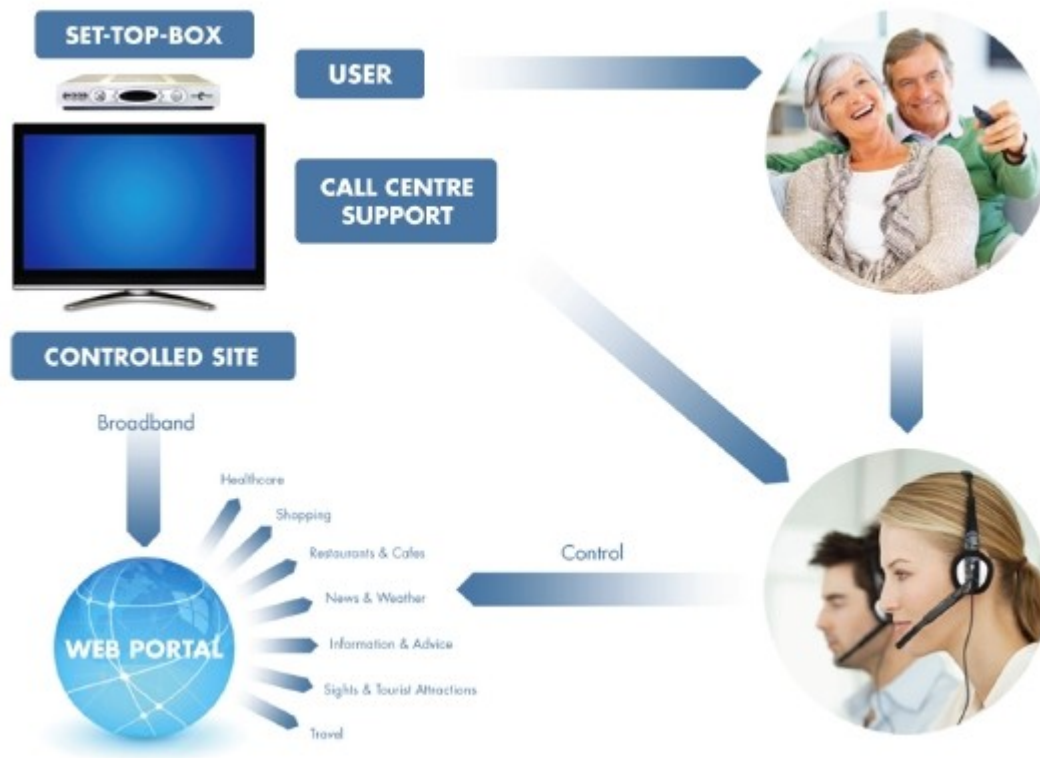


Figure 2: Nexus TV Business model

Technology as a way of saving money?

Ocean Blue believes these software applications could provide considerable cost savings and efficiency for central and local government and the Health Service as a whole. The assistive technology will enhance the lifestyle of others whilst ensuring that people can live in a safe environment independently. As the population ages, it is more important than ever that social care gives older people choice and control over services that help them to remain independent. Expenditure on Older People (aged 65 and over) in 2010-11 was £17.0 billion in 2010-11 compared to £16.8 billion in 2009-10. This was a 1 per cent rise in cash terms but a decrease of 1 per cent in real terms.¹⁶ Devices such as health monitoring will ease the pressure on hospitals and doctors surgeries by enabling the patient to monitor their own symptoms from their own homes.

Nexus TV Gateway

The Nexus TV gateway can be controlled and regulated by local authorities or individual care homes. The broadband connection to the Nexus TV set top box allows access to the portal and to external web links. The Nexus TV browser operates on a “walled garden” basis; only authorised content and websites will be available. These may be websites operated by associations such as NHS Direct, Social Services, or Local Councils for example. The Nexus TV system allows for the creation of a back-end structure of support, monitoring and call centre functions. (See Figure 3 below.)



Figure 3: Nexus TV Portal website

Technology

Incorporated into the Nexus TV total solution will also be the award winning “Talking TV” technology. The development was carried out in association with the Royal National Institute for the Blind (RNIB) to create an accessible set top box targeted at the worldwide mass market, to address an increasingly ageing demographic of visually impaired users. The technology benefits users who have visual impairments and other disabilities, by voicing the programme guide and menu items. The technology incorporates an advanced user interface, specifically designed for varied levels of visual impairment.

A video demonstration of the technology is available; please visit the Nexus TV website www.nexustv.co.uk

Adaptable Technology

Nexus TV can be adapted to each person's individual needs, for example someone with failing eyesight would base the functionality on text-to-speech, and users with early stages of dementia would use the visual design to drive a more simplified functional model. In addition to this approach the remote control will be adapted in line with the abilities of each individual.

Conclusions

The challenges that face the NHS and other health and social care providers are based around the issues of reduced funding, less resources and an increasingly ageing population. Although life expectancy is higher, due to the ability of controlling formerly deadly or debilitating diseases, the elderly as they age live for longer but experience more long-term conditions that need care and treatment. This demand is having a significant effect on the health care system and consequently the standards of care are slipping; influenced by overcrowding and lack of funding.

The switch from analogue to digital devices in the home is a crucial step towards introducing advanced, cost effective, assistive technology, and the continuation of this into the modern world is expected to have a thoroughly positive impact for the elderly, impaired and disabled. Having the option to stay living independently for longer and be monitored in the comfort of one's own home will inevitably relieve the pressure on hospitals, doctor's surgeries and care homes. People need to become active rather than passive in managing their own requirements, but this does not mean that vulnerable people are expected to be left to look after themselves, however there needs to be a balance between necessary care and preventable care.

Nexus TV will provide part of the jigsaw to assist people; the challenge will be to combine and integrate a variety of assistive technology products into a workable total solution. The emergence of the connected home means that to avoid the consumer becoming confused, devices will need to interoperate transparently to ensure that the user experience is a seamless one.

Ocean Blue Software is looking to expand and healthcare partners that will assist in the development of the Nexus TV solution and provide the breadth of experience and knowledge required. As experts in the provision of set-top box and middleware software technologies Ocean Blue are able to constantly update and develop the product in conjunction with healthcare and market demands.

For further information please contact Amy Lowe: amy.lowe@oceanbluesoftware.co.uk
www.nexustv.co.uk
Ocean Blue Software Ltd.

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