



Yn cefnogi pobl
â cholled golwg
Supporting people
with sight loss

Digital Media Usage of Sensory Impaired Users in Wales 2018 Report

What benefits have digital media brought to sensory impaired users in Wales and what are the barriers that affect people who have sensory loss in using digital technologies?

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Executive Summary

This document summarises the main statistical findings from a survey of digital media usage and attitudes of sensory impaired users in Wales. The survey ran from March to May of 2017, and was part of a research project based at Swansea University, funded by Challenging Human Environments and Research Impact for a Sustainable and Healthy Digital Economy Centre (CHERISH-DE). The survey aimed to gain a better understanding of some of the benefits that digital media has brought to sensory impaired users in Wales and some of the barriers that affect people who have sensory loss.

This survey firstly provides a general mapping of sight impaired users in Wales. 73% of people surveyed are over the age of 65. This is in accordance with the, RNIB Evidence-based Review of People with Sight Loss in Later Life (2015) which shows that of the 342, 531 registered as blind and partially sighted people in Great Britain, 73% are aged 65 and over. Hence the sample is representative enough to reflect the true nature of the sensory impaired population. Among the 396 respondents, 42% of respondents are male, while 58% are female. 87% of the respondents are retired or do not work. With regards to their impairments, 30% of the survey respondents have dual sensory impairment and 22% of the respondents wear digital hearing aids.

In terms of digital media ownership and usage, overwhelmingly respondents' digital device ownership is low comparing to the national average. In general, blind and partially sighted people who responded to the questionnaire demonstrate a disadvantaged level of digital media engagement. The ownership of and access to digital devices varies but roughly in the range of 20% to 40%. Personal Computers were owned by most of the respondents (39%) and smart phones had the least popularity (23%). Although a smart phone is the most personalised device, it is the least owned or used among sensory impaired users. Across the sample the ownership rates for digital technology were lowest in the 75+ category.

Reported data showed that although only used by half of the sight-impaired community, digital media is crucial to the wellbeing of the sight-impaired users.

- Using a search engine is regarded as the most frequent online activity carried out with almost 2 in 5 (39%) of the respondents using a search engine while they are online.
- 34% of the respondents use email to send personal messages to family or friends.
- 33% of the respondents can find a website that has been used before.
- 28% of the respondents engaged in online shopping.
- A similar percentage of respondents (18% and 17%) download or save a file found online or chat with family and friends by using video messaging tools.
- 17% of the users buy and install applications or software via the internet.
- 14% of the users go online to access public services.
- 13% of the respondents show an awareness of online security and safety and they are careful in making online comments and sharing personal information with others.
- 11% of the users use the internet to book appointments.
- 6% of the respondents use the internet for job applications.

This survey has identified a number of barriers facing people who are sensory impaired in Wales in accessing information, education and services. Barriers were identified mainly in the areas of financial restraints, access to training opportunities, and web accessibility.

Finally, the report concludes with the following recommendations:

- Sustained training and support are crucial in helping sensory impaired users to understand the full range of interactive services available on digital platforms. We recommend that priority should be given to making people aware of the customisation and interactive services that enable users to perform activities such as to alter the size of text font or the colour of webpage background.
- Alternative technologies, such as free software and free mobile applications, are to be considered as a solution to overcome the financial restraints faced by sight-impaired users.
- The British Standard 8878 Web Accessibility Code of Practice (BS8878) must to reinforced in both public and private sectors.

- We recommend a new technology design agenda to the industry in both public and private sectors. We would endorse what Graham Pullin (2009) suggests the 'resonant design' approach, which incorporates disabled and nondisabled users based on coincident needs. Design should emphasize on users and tailor the technology capacity around the need of the user, even such design might look like low-tech and long-lasting.

1. Introduction: Sensory Impairment and Digital Media and Communication Technologies in Wales

This document is a summary of the main statistical findings from a survey into the digital media usage and attitude of sensory impaired people in Wales. The survey ran from March to May 2017, and was part of a research project based at Swansea University, funded by Challenging Human Environments and Research Impact for a Sustainable and Healthy Digital Economy Centre (CHERISH-DE). Studies show that the use of the internet and digital technologies has grown dramatically in recent years and benefited many aspects of social life. However, particular groups of consumers, in particular, disabled people, are disadvantaged in gaining access to the online world (Lunn and Lyons 2010). Scholarly research argues that when the Internet matures, digital divide has been intensified to reflect the offline social, economic and cultural inequalities (Chen and Wellman 2005; van Dijk, 2005; van Deursen and van Dijk 2013; Witte & Mannon 2010). Within the disabled community are people with considerable sensory impairments. Recognising that digital exclusion could further disadvantage this community, we aimed to gain a better understanding of the usage of digital media and communication technologies by sight impaired users, and investigate the possible solutions to their barriers to enjoying the benefit from using the internet and other digital services.

According to the UK government's communications regulator Ofcom, digital technology usage in the UK is amongst the highest in the world. In its most recent report, Ofcom (2017a) states that for digital technology ownership: 88% of adults in the UK have internet access at home; 76% use a smartphone and 42% regard smart phones as the most important device to access the internet. In Wales, the proportion of homes with internet access is 84%, and smartphone ownership is 74% with 36% of users regard smart phones as the most important device in accessing the internet (Ofcom 2017b). Since the advent of home broadband internet, the commercial use of smartphones and other internet enabled devices, there has seen a shift in our communications practices. For instance, 76% of Welsh internet users stated in the Ofcom 2015 survey that 'technology has changed the way they

communicate' and 65% agreed with the statement that digital communication had 'made their life easier' (Ofcom 2015a:6). This is reflected in recent changes in digital exclusion; the numbers of digitally excluded adults in Wales has reduced by over 300,000 in the last five years, but the challenges faced to get more citizens and organisations to embrace digital technologies are far from resolved. (Welsh Government, 2016: 5).

It is estimated that around a fifth of the adult population in Wales currently does not regularly use the internet. The majority are likely to be older people, disabled people, those with limited qualifications and those on low incomes. The 2014-15 National Survey for Wales found (Welsh Government 2016:17):

- Only 63% of 65-74 year olds use the internet and this number falls to 29% for those 75 and over. This compares to 99% of 18-24 year olds and 96% of 25-44 year olds.
- Household tenure is an indicator of digital exclusion, with those in social housing nearly twice as likely not to have a home broadband connection.
- 71% of households living in the 20% most deprived areas in Wales had access to the internet, compared with 86% of households living in the 20% least deprived areas.
- Digital exclusion amongst disabled people (38%) is double the figure for all adults (19%).
- Some of these factors may be mutually reinforcing. For example, those with sight problems and other impairments are more likely to be aged over 65.

In the Welsh Government's own words "Reaching the 474,000 adults who don't use digital technologies remains one of the greatest challenges in Delivering a Digital Wales" (Welsh Government, 2016: 13). A heat map of digital exclusion in the UK, based on both digital infrastructure metrics and social ones, demonstrates that Wales has some of the most likely areas for exclusion to exist (Tech Partnership 2017). Against this backdrop of increasing technological saturation the question which needs to be asked is who is missing out?

In the past, the term 'digital divide' referred to economic factors and the affordability of technology. This has now changed and includes much more dynamic demographic issues, such as disability. According to the Royal Institute of Blind People, there are over two million people living with some form of sight loss in

the UK and 107,000 of them living in Wales (RNIB 2017). According to Ofcom reports (2015b; 2016), although visually-impaired consumers are less likely than non-disabled consumers to have access to the Internet and digital devices, the gap between their access is narrowing. For example, in 2012, 65% of visually-impaired consumers comparing with 79% of the non-disabled consumers have access to PC/Laptop; in 2016 the comparison is 78% to 84%. In 2012, 62% of the visually-impaired consumers comparing with 83% of the non-disabled consumers have access to the Internet; while in 2016, the gap was narrowed down to 88% and 94%. However, the digital exclusion does not stop at the stage of ownership and access. A look into online activities exhibit that visually impaired users are still disadvantaged in accessing information and services (such as online shopping, online banking, etc.) (Ofcom 2015b; 2016).

Although significant progress has been made in the past years in terms of widening access to communication technologies, visually impaired users are still disadvantaged in accessing information and services in the digital era. The aim of this survey was, therefore, to provide a more detailed examination of visually impaired community's take-up and usage of digital technology with a focus on accessibility and affordability of technological devices and software. The research was achieved with the cooperation of the Welsh arm of the charity Royal National Institute of Blind People (RNIB) and their network of members. The rationale underpinning this research was based on the premise that access and use of digital technology can be transformative in the way someone communicates, but there is a whole population of people who cannot use said technology, or simply do not want to.

2. Aims and Objectives of the Survey

In this research, we aimed to:

- Identify the patterns of digital media adoption and usage among sensory impaired people in Wales;
- Identify the types of online activities and assistive technologies in which people engage and would like to engage;
- Identify the barriers to full digital inclusivity among sensory impaired people in Wales;
- Provide recommendations that will enable sensory impaired users to overcome the barriers to using digital services.

3. Methodology

To complete the study, an easy-to-follow questionnaire (Appendix I) was designed to extract both quantitative data as well as qualitative data from respondents. The quantitative questions measured facts (e.g. demographics), preferences (e.g. digital media usage), behaviour (e.g. online activities) and barriers in the format of nominal or ordinal questions. The qualitative questions measured attitude and drew recommendations from users with regards to how to improve accessibility and digital services.

With the support and collaboration from RNIB Cymru, Swansea University researchers sent out in total 3274 questionnaires in hard copy via post in March 2017. A freepost envelope was provided to ensure questionnaires could be returned easily and efficiently. An e-copy of the questionnaire was at the same time sent to those who preferred to be contacted via email. A telephone survey of 100 sensory impaired users was also conducted in order to reach the hard-reaching demographic who suffer from severe or multiple disabilities by research assistants in May 2017.

In total, 396 valid answers were returned, giving a 12% response rate. Among the valid questionnaires, 6 responses were returned via email, 375 were from a paper-based survey and 15 were from the telephone survey. Since this survey required segmentation analysis and focuses on a unique and hard to reach demographic, the 12% response rate is both representative and acceptable, and represents a margin of error for a true representation of 4.6%.

All responses were entered into SPSS, a statistical software package for quantitative analysis. Percentages presented in the report may not equal 100% due to respondents selecting multiple answers. For data validation reasons, incomplete surveys are not included in the quantitative analysis; however, they are included in the qualitative analysis and may be used in future publications if the information returned is relevant to the specific research questions posed by those investigations.

4. Findings

4.1 Demographics

There was a very high proportion of responses from people aged 55+ (85% or 336 surveys). The survey indicates that:

- About 1% of respondents were under the age of 16;
- 2% were between the ages of 16 -24;
- About 2% were between the ages of 25-34;
- Roughly 3% were between the ages of 35-44;
- About 7% were between the ages of 45-54;
- About 12% were between the ages of 55-64;
- 73% were over the age of 65 years with 52% of the respondents 75 years or older.

The distribution of ages of participants in the survey shows 73% of the sample population over the age of 65, reflecting the fact that visual impairment affects senior citizens more often. This is to be expected given that the sampling was of persons specifically identified as having a difficulty with sight, which is more prevalent in older people in the general population. This is in accordance with the RNIB Evidence-based Review of People With Sight Loss in Later Life (2015) which shows that of the 342, 531 registered as blind and partially sighted people in Great Britain, 73% are aged 65 and over. Hence although it seems to be a skewed distribution of ages of participants, the data proves to be representative enough to reflect the true nature of the sensory impaired population.

Among the 396 respondents, 42% of respondents are male, while 58% are female.

The survey questionnaire aims to identify the respondents' location by their electoral regions (that is, North Wales, South Wales West, South Wales East, Mid & West Wales; South Wales Central). Data gathered illustrates that most respondents came from South Wales East (37%) South Wales West (31%). There is a relative underrepresentation of Mid and West Wales (4%) compared to other regions, and unfortunately no respondents from North Wales.

Considering the age distribution of the respondents, it is not surprising to find that:

- 87% of the respondents do not work;
- 7% of the respondents either work full-time (2%) or part-time (5%);
- 4% of the respondents engage in voluntary work;
- 2% of the respondents prefer not to say.

In answering the question with regards to sensory loss, respondents could respond to as many options as are appropriate to the question regarding their level of sight loss or dual sensory losses (both sight and hearing losses).

The key findings are:

- More than half of all the survey participants (roughly 52%) are partially sight impaired and 40% are severely sight impaired;
- 40% of the surveyed respondents have dual impairment;
- Among the 156 dual sensory impaired users, more than half of them identified themselves as hard of hearing or deaf (42% and 11% respectively); and 56% of the dual sensory loss respondents wear digital hearing aids.

We would like to emphasize that respondents were able to enter more than one answer to the question of sensory impairment, which leads to parts of the statistics adding up more than the total number of respondents of 396. For instance, they could be sight impaired and dual sensory loss. Furthermore, if dual sensory loss was chosen then the type of hearing impairment also involves multiple choices. This was done to capture the range of sensory impairments to uncover their impact on engagement with digital technology.

4.2 Digital Media Take-up

This section aims to identify digital media ownership, usage and online activities among sensory impaired users. In measuring digital media usage, the key findings of the survey also concern the use of assistive technology in facilitating access.

Key findings show that:

- 34% of the respondents own a PC; 31% own a tablet, 21% own a smart phone and 22% own a smart TV;
- Despite a lack of ownership, a small percentage of respondents have access to the following digital device: 5% have access to a PC; 2% to a tablet; 2% to a smart phone; and 2% to a smart TV;
- Majority of the respondents neither own nor have the access to common digital device. 62% of the respondents states that they don't own, nor do they have access to a PC; 67% states that they don't own, nor do they have access to a tablet; 77% states that they don't own, nor do they have access to a smartphone; 76% states that they don't own, nor do they have access to a smart TV.

Overwhelmingly, respondents' digital device ownership is low comparing to the national average. In general, blind and partially sighted people who responded to the questionnaire demonstrated a disadvantaged level of digital media engagement. Comparing with figures gathered from the Ofcom Communications Market Report 2017 and the Ofcom Communications Market Report Wales 3/8/2017, a significant level of discrepancy can be detected in terms of digital media take-up:

- While 39% of the survey respondents either own or have access to a PC, the national average is 76% and Wales' average is 79%;
- While 33% of the survey respondents either own or have access to a tablet, the national average is 58% and Wales' average is 61%;
- While 23% of the survey respondents either own or have access to a smart phone, the national average is 76% and Wales' average is 74%;
- While 24% of the survey respondents either own or have access to a smart TV, the national average and the Wales' average are both 36%.

The ownership of and access to digital devices varies but was roughly in the range of 20% to 40% with a PC being owned by 39% of the respondents and smart phones being the least popular digital technology (23%). Although smart phone is the most customisable device, it is the least owned or used among sensory impaired users.

We asked respondents what forms of assistive technology they use. In general, the up-take of assistive technology associated with using a digital device is low. The proportions are taken from the number of respondents and not the total number of responses because this is a multiple-choice question.

The clear majority (59%) of the respondents do not use any kind of assistive technology. The most popular form of assistive technology is screen magnification with 28% up-take rate, followed by voice recognition software and accessible keyboards (at 14% and 13% respectively). The rate of using other forms of assistive technology is 10% or below.

A screen magnification system could provide accessibility for users with low vision by enlarging text, graphics, icons, buttons and title bars etc. on a computer screen. The examples we offer to respondents include screen magnification system such as Zoom, Supernova, and Zoomtext. The system can also highlight the magnified area with colour and shading, which makes it easy for the user to track the magnified area. Although more than half of the respondents identify themselves as partially sighted, the uptake rate of screen magnification is 17%.

With suitable voice recognition software, sight impaired users could make their digital gadgets recognise commands issued and text dictated. Voice recognition (e.g. Siri, Dragon Naturally Speaking) could be the most empowering assistive technology that enhances access to network services considering learning keyboard layout and manoeuvring mouse could be overwhelming for sight impaired users. The take-up rate of this technology is 14%.

Accessible keyboards are designed to have lettering in large and bold format (often black on yellow keys) and are aimed to make using computer easier for sight impaired users. The take up rate is 13%.

An accessible mouse is designed to enhance accessibility for users with sight impairment. It can be in the form of large trackball containing high contrast colours with related software that changes the mouse pointer size and shape enhancements. 10% of the respondents use an accessible mouse.

Specialist software such as Synaptic is an all-in-one software package for sight impaired users that runs on Android smartphones and tablet computers. The comparatively high cost of such software and the often low income of blind and partially sighted people could be the reasons leading to the low take-up rate of such technology. 7% of the respondents use such software.

Screen reader (e.g. Voice Over, Talk back, JAWS, NVDA) software can send input information to a voice synthesiser and avail text to speech to users. These were used by 6% of the respondents.

There are many useful apps via digital devices for hearing loss at no cost of the users. For example: MobileSign enables people to learn BSL; BioAid turns a smartphone into a hearing aid by processing sounds from the microphone and sent output over headphones; Next Generation Text Service (NGTS) allows users to make calls via computer, PC, laptop, tablet or other mobile devices the same way as they use textphone, etc. Since our respondents are registered RNIB members, hearing loss is part of dual sensory loss, which explains why the uptake rate is low in this sample (3%).

The selective sample for this survey could also possibly explain the low uptake rate for amplified hearing aid compatible smartphones which were used by 1% of respondents.

Smartphones, as portable personalised communication devices with various accessibility features and apps, could be most relevant technology in terms of facilitating sensory impaired users in their daily life, but the up-take rate is low. The low take-up of digital assistive technology seems to be also associated with age. In our survey, a co-relation between age and the lack of interest in taking up digital technology is visible.

Some respondents expressed the sense of frustration and disappointment over their exclusion from the digital society:

“I wish someone had supported me in acquiring the necessary skills 20 years ago. It's rather too late now”

“This technology wasn't available when my mother could see”

“I basically lost my job. My only option was to take early retirement and this all happened very quickly”

“Aids I have looked at are very expensive”

4.3 Online Activities

The survey aims to identify the experience of people who are sensory impaired in accessing information and services via digital media. We asked a set of key questions as sketched out in the GO ON UK (2015) report on digital skills in which basic digital skills were categorised into managing information, communicating, transacting, creating and problem solving. We asked questionnaire respondents what kind of online tasks they perform in accordance to the five categories of digital skills. This was a multiple-choice question and the numbers used for the chart are based on the proportion of individual respondents, and not the total number of answers to the question about ‘online activities’.

Reported data shows that:

- Just over half of the respondents (50%) said that they did not do any online activities.
- Using a search engine is regarded as the most frequent online activity carried out with almost 2 in 5 (39%) of the respondents using a search engine while they are online.
- 34% of the respondents use email to send a personal message to family or friends.
- 33% of the respondents can find a website that has been used before.
- 28% of respondents engaged in online purchasing of goods or services.
- A similar percentage of respondents (18% and 17%) download or save a file found online or chatting using video messaging tools.
- 17% of the users buy and install applications or software via the internet.
- 14% go online to access public services.

- 13% of the respondents show an awareness of online security and safety and they are careful in making online comments and sharing personal information with others.
- 11% of the users use the internet to book appointments.
- 6% of the respondents use the internet for job applications. The explanation for this low figure is found in the demographics of the respondents, where the majority were either approaching retirement or in retirement.

To assess the correlation between age and digital skills, we analysed the above results further with regards to the age categories of respondents. The categories for the younger ages are less representative of the sample due to their relative small size. However, the data does show that there is a gradual increase in the number of people not partaking in online activities as the age groups increase in age. The proportion of people 75+ who answered 'do not do any' is 68%. This is larger than any of the other categories by 28%.

4.4 Barriers to Digital Inclusion

Although there are a few users showed a lack of motivation in using digital media or accessing digital services due to age (in their 90s) or multiple disabilities, the majority of the respondents expressed a keen interest in taking part in the digitally inclusive society.

Conducting a thematic analysis of the qualitative input from respondents, we identify the following reasons that contribute to the digital exclusion of the sensory impaired community.

4.4.1 Financial barriers

Financial restraints are regarded by many respondents as the first hurdle to overcome. Respondents commented:

“Gadgets for the blind and sight impairment are too expensive to buy”

“I cannot afford a computer or a tablet and then broadband.

Reduce costs for the use of this technology”

“The older generation should have a lot more to do with laptops and tablets, but the cost is a problem”

We did a rapid evidence assessment of assistive technology hardware and software provided by a leading UK-based company Inclusive Technology. The price for the cheapest accessible keyboard is £20, compared with the cheapest ordinary keyboard on Amazon which is £8 pounds. Visual impairment software ranges from more than £355 (Dolphin SuperNova which offers a screen magnifier and a screen reader as well as support for Braille display) to £845 (for example, JAWS for Windows Professional which support standard Windows applications for visual impaired users).

Further communication with Ms Margaret Geddes from South Wales West who is registered deaf blind further addressed this issue:

“The financial barriers and the unfortunate reliance on brand products when introducing digital inclusion is the real barrier to the dual sensory and blind community being full emerged in technology”
(8/3/2017)

In addressing the financial issue as the first hurdle for sight impaired users to be digitally included, RNIB has been actively promoting the use of free accessibility software to its members. The RNIB website (n.d.) has listed a wide range of free assistive technology options include magnification, text-to-speech applications and non-visual desktop access application, etc. Nevertheless, there seems to be a lack of users’ awareness of free assistive technology and more training in this area which would help facilitate the knowledge dissemination within this community is needed.

4.4.2 Training Barriers

Although there are a few users who showed a lack of motivation in using digital media or accessing digital services due to age (in their 90s) or multiple disabilities, most the respondents believes that digital technology brings benefits to their life.

- A clear majority (77%) of the respondents believe that digital technology brings them closer (or in contact) with friends of family;
- More than half of the respondents (55%) believe that digital technology facilitates more independent living;
- 42% of the sample regard digital technology as giving them the chance to know what is happening in their community;
- Just under one third of the sample think digital technology improves general wellbeing (29%); and make them more capable at choosing the appropriate and convenient media in communicating with others (30%);
- Just under a quarter of the sample think digital technology gives them more opportunities in education (20%); helps with managing money (23%); and improves their ability to travel (24%);
- 12% of the sample believe that digital technologies improve opportunities in employment;

However, it seems that the current provision of training falls behind the needs of the users. When asked to whom they turn to if they need help with digital media technology, 73% of the respondents list 'family members and friends' as the key source of information and knowledge. 22% of the respondents gain support from libraries; 10% of the respondents were supported by RNIB Digital Skill Officers; 3% of the respondents were given support or training from their employers; while 24% of the respondents state that they do not know where to seek support and training.

A point worth noting is that there are training programmes provided by digital skills officers from the Online Today project. Online Today is a three year, Big Lottery funded programme delivered by RNIB aiming to help people with sensory impairment to get online and use digital technology. Online Today offers guidance and advice across the UK. The project in Wales provides one to one individual support and is delivered in a range of environments including in people's homes, in hospitals, community centres and local libraries.

RNIB was highlighted by several respondents as the source of support in combating digital exclusion. Benefits gained from digital skills training provided by the RNIB Online Today team were regarded as very 'helpful'.

“I had a lady come to my home and gave me one to one advice and showed me what I could do she was from RNIB. That was a great help to me. My husband has had very good support and help from RNIB, talking books have been a help”

The one-to-one training was regarded in particular as very beneficial:

“It has been a massive thing for me, it makes all the difference when someone comes to your home to show you how to do things, without my digital skills officer I wouldn't have done it”

Online Today's work has been welcomed by blind and partially sighted people, but the enthusiasm from the users who are keen to learn digital skills seem to be dampened by the lack of digital officers:

“I am sure a lot of people in Wales would benefit if there were more instructors. I had to wait weeks!”

Meanwhile, due to the unique age demographic of this community, many respondents expressed the preference of having training taking place at home on one-to-one bases. Survey respondents expressed their expectations of 'more learning places for blind and hearing impaired people in Wales', more 'home visits' that are 'regularly followed up'.

The Online Today project provided a service delivery model that works effectively and successfully in Wales as evidenced by the evaluation. It found that the training delivered by the programme has provided the solutions for beneficiaries to start their journey to get online, get back online, maintain their online participation or do more online. Learning about access technology, and developing the skills to use it, has been pivotal within this.

Furthermore, although Online Today has worked to positively move beneficiaries towards being online and has helped people to stay and do more online. Customers still face a range of barriers which continue to prevent them from progressing digitally. Many of which concur with the findings of this survey. These include:

- worries about safety and their ability to protect themselves online;
- lack of knowledge, confidence and ability to use devices and access technology to help them progress;
- inaccessibility of websites and applications;
- cost of devices and access to the internet;
- availability, accessibility and expertise of mainstream technology training providers.

What should be highlighted is that the training service offered from Online Today in Wales is unique. It focuses on home-based learning on a 1:1 basis, following a technology needs assessment that is led by customer needs. The brief is to help people understand the benefits of being online, to help them get online and, crucially, that they stay online. That requires Digital Skills Officers to remain involved over several sessions over a period of weeks or months to ensure that learning is practiced and embedded. However, as Chris Hoyle, leader of the Online Today Welsh team acknowledged that the model is resource intensive in terms of staffing and finance. Despite the 8 FTE paid staff to deliver the work in the community, users still find the waiting times for one-to-one training and home visit is not satisfactory. ‘We agree that further sustained training is required’, Mr Hoyle said (22/11/2017).

4.4.3 Accessibility Barriers

The Equality Act 2010 guaranteed the equal rights to accessing online content for disable users. Accessibility has been a well-established policy in a range of government documents concerning building a digitally inclusive society. Health and Safety Executive 2013 ‘Website accessibility policy’ paper highlights the accessibility standards for all new websites. The website design must consider a range of disabilities from the users including those ‘with no vision and partial sight including colour blindness and tunnel vision’ (2013). However, respondents provided their experience of accessibility barriers in accessing websites:

“Often the print is too small e.g. bank apps”

“I do not like moving or animated websites which move before you can read them”

“Coloured text and/or background is an obstacle to reading”

The BBC’s (n.d.) ‘Mobile Accessibility Guidelines’ offers an extensive example of what can be done in this respect. However, difficulties in access still exist:

“Sort out the digital and produce more audio description TV programmes”

“Some captions on TV need to be bigger (how flexible are TVs in allowing this to happen?)”

One respondent highlighted the importance of speech recognition and sketches the ‘smart house’ as a solution to digital exclusiveness:

“I can only interact with voice recognition. I use Amazon Echo, which is excellent but limited in functionality. It would help me greatly if white goods had voice recognition or voice notifications”

Digital technology can transform many traditional household electronic appliances into a series of human-computer interfaces and voice recognition can be embedded into these products. A SmartTV, for example, is characterised as a TV with an internet connection, applications and content and accessibility based on a human-computer interface as part of its functional requirements. Amazon Alexa and Apple Siri can both be integrated with Smart TV services as forms of controlling the TV and could be part of the digital environment at home. Some smart TV brands features voice control microphones built into the remote control which is potentially empowering for sensory impaired users. Nevertheless, using such state-of-art technology requires both financial investment and a high level of digital literacy. For example, to enable the interactive voice control on Samsung 2014 smart TV, users must first set up a Smart Hub, set the TV’s clock and have the TV connected to the Internet (Samsung, n.d.). The voice commands can then be used if the user accesses the Tool menu to set up the voice commands, presses the voice button on the remote, and interacts with the voice control indicator shown on TV.

The technology-oriented problem-solving approach therefore involves an issue regarding the first encounter with technology. Research proves that almost half of the adults who use the internet or have a mobile phone in the US said they usually needed someone else to set a new device up for them or show them how to use it (Horrigan and Jones 2008). It is difficult to imagine how digital disadvantaged users are expected to operate confidently in the fully digital environment without robust and sustained support in place.

RNIB's innovation and technology team are working to build relationships and influence the design of products in this growing area. However, Chris Hoyle Digital Inclusion Manager of the Online Today project said, 'While Online Today has been able to include the growing presence of some voice activated technology, the project is not resourced to support with training around the 'internet of things' such as Smart TV's NEST, light bulb and home appliances. Indeed, there is a question how that could be addressed given the huge variety of settings from different manufacturers' (22/11/2017).

4.5 Suggestions for the Future

4.5.1 Sustained training and support

As to the set of digital skills to be acquired, survey respondents provided the following choice based by preference.

- The majority of the respondents (61%) would like to enhance skills that help them 'search and find information online' and know more about how to 'communicate with family and friends' by using digital media (55%);
- Almost half of the respondents (49%) would like to gain more skills in protecting personal data online;
- The other two areas that chosen by more than a third of respondents are skills associated with online shopping (42%) and access to public service (35%);
- About a quarter of the respondents (24%) would like to gain skills on creating and uploading original content online.
- Due to the unique demographic of this community, the demand for 'search and apply for jobs' is not very high (8%).

As many age-related sight impairments (for example, cataract or macular degeneration) develop over a course of years, precautionary measures could have been introduced at earlier stage to minimize the impact of major or total sight loss. One respondent who lost partial sight due to macular degeneration suggested 'a preparation course' for the elderly to cope in the digital era:

“As Macular degeneration is the reason for might [sic] sight loss - would there be a way to learn some basic digital skills before being totally incapacitated? A preparation course before becoming blind”

Chris Hoyle from the Online Today team said, 'the Online Today project is open to all those who self-identify as having sight loss and access to the project is not reliant on being registered as severely sight impaired, partially sighted or blind. This message has been consistently relayed over the period of the project and referral routes to Online Today reflect that openness.' (22/11/2017).

It seems that cultivating the awareness and interest to learn among the users could be the appropriate way to lead to sustained training in the future. As one of the respondents, Margaret Geddes, says:

“If the digital inclusion programme highlighted an individual's interest by showing them how their basic devices have programs that are under-utilized and encourage the individual to explore these devices - the seeds of desire for learning will be born. An individual who is inquisitive tends to be happier and more eager to learn” (8/3/2017)

Although the questionnaire was about digital media usage, the importance of non-digital communication means was pointed out by some respondents as crucial alternative to the digital inclusive learning and training:

“Do not abandon or diminish postal and telephone communication services for elderly, elective off-liners. I do not want to become dependent on others to conduct my business.”

“The sighted don't understand the blind. It's nice to get out of the house. Ring 195 [which is a free telephone directory enquiries service for blind or partially sighted people] is very helpful.”

One of the questionnaires was filled by a care-taker on behalf of the respondent. The respondent has difficulty with technology due to a combination of disabilities and old age. ‘Take care making all services online,’ warned the respondent.

4.5.2 Areas for digital service improvement

We invited respondents to make suggestions to the government and business with regards to how digital services for sight impaired and dual sensory impaired people could be further improved in Wales.

Many suggestions on improving digital service in the public sector focused on public transportation and public broadcasting services. For many sensory impaired users, public transportation was identified as the main area where assistive technology could be used and improved. Some respondents said that currently transportation notices at bus stops or railway stations are often ‘unreadable’ for sight impaired users because the font size of the text is very small.

Public broadcasting service is identified as another area that needs further assistive technology, but suggestions mainly focus on improving sound quality and subtitling services:

“Do away with background/atmospheric background music during dialogue.”

“Sort out the digital and produce more audio description TV programmes.”

“Some captions on TV need to be bigger (how flexible are TVs in allowing this to happen?)”

Suggestions like these are from respondents having dual sensory losses. The issues raised here have been addressed in the

Swansea University researchers' previous project on digital television and deaf/hard of hearing audiences in Wales (Wu et al. 2014). The BBC has promulgated various editorial guidelines in promoting accessibility for deaf and hard of hearing audiences. Such endeavours could be seen in documents such as Editorial Guidelines for Hearing Impaired Audiences (BBC, 2011), Online Subtitling Editorial Guidelines (BBC, 2009) and more recently the promotion of accessibility on the Internet. S4C has also created guidelines for subtitles on their programmes – *Canllawiau S4C ar gyfer isdeitlwyr yng Nghymru* (S4C, 2008). All these guidelines on the production of media content provided information on how to improve sound quality and subtitle accessibility. Similarly, Ofcom's statement (Ofcom, 2013c) provides clear information on the current work in improving the quality of live subtitling and subtitling for repeats and on-demand programming.

However, this survey suggests that the use of background music and the presence of background noise caused problems for many deaf and hard of hearing respondents or users with dual sensory impairment. It is therefore important to enhance the awareness of accessibility-related issues among programme producer in the pre-production, production and post-production stages.

Suggestions on improving digital services in the private sector covers mainly web accessibility issues. Respondents offered recommendations on applications and websites, small print and colour contrast:

“I wish all apps were expandable as often the print is too small e.g. bank apps”

“I wish websites were clearer with good colour contrast and easily evident buttons”

Due to its popularity, the internet search engine Google was named by one survey respondent as the hope to 'improve' accessibility. As a matter of fact, most of these problems presented can indeed be solved by Google. For example, Google's web browser Chrome offers a Distill mode for users who want to read text by removing unnecessarily distractions web page elements (such as ads) from the website. It is regarded as particularly useful option on sites using flashing or video advertisements. Such an issue highlights again the lack of

awareness of basic accessibility features built into common web browsers, operating systems, and other services available on digital platforms.

5. Conclusion and Recommendations

Digital media and communication technologies have brought about many benefits to society and provided help in making knowledge, information and services available to vulnerable communities if assistive technology is managed properly.

Based on the above analysis of data gathered from this survey, we offer the following recommendations with regards to promoting digital inclusivity for the sensory impaired users.

1. Sustained training and support are crucial in helping sensory impaired users to understand the full range of interactive services available on digital platforms.

This study revealed that a significant percentage of respondents are not aware of the range of services available on digital platforms. The RNIB and Online Today team have provided crucial training to vulnerable community members. However, it appears that further sustained support is still needed from local authorities, charities and industries from both public and private sectors so that sensory impaired users can grasp the whole range of accessibility functions enabled by digitalisation.

We recommend that priority should first be given to making people aware of the customisation and interactive services that enable users to perform activities such as to alter the size of font of text or colour of webpage backgrounds.

We would like to highlight the issues associated with the under-utilization of existing programs to support accessibility (Kane et al. 2009). Many accessibility features suffer from a lack of training which limits their utilisation and discoverability (Morris and Mueller 2014). This means that many users are simply unaware of features that can help them embedded in the operating system of their devices. Most modern devices are designed to provide a polished 'user experience' with them so tend to disavow formal training and manuals. Instead of focusing on providing the smoothest and most seamless of first time experiences with, for example, basic training should not be overlaid on the system the first time they are used. While enjoyed by most users, for those with more specialised needs this leads to a lack of opportunity to engage with disability supporting features. Even a small amount of training can be

enough to allow some users to re-engage with their devices and an awareness that the features even exist can be enough to motivate an individual to seek them out. The examples discussed in this report include the accessibility features embedded in the web browser Chrome.

2. Alternative technologies as a solution to financial restraints.

Ultimately, assistive technology should be made affordable for the population that it is designed for. However, lowering the cost of many technologies is complex and involves multiple actors that inhibit the possibility of this being achieved. At the same time, it is equally important for the community to discover and utilize bespoke alternative technologies which are often freely available.

RNIB has already identified a range of free software that are important for its members to gain access to the digital world. More recently, the near ubiquity of modern mobile computing affords an avenue that might be exploited. For example, modern phones location-aware capabilities (via WiFi, GPS and GSM cell towers) can allow them to act as a medium for the delivery of context aware support to sensory impaired users via high quality audio description.

The importance of the human touch in support networks should not be superseded by technological advancements. Some free mobile applications can indeed bring human generosity to technology, and connect people via a low-tech, human-oriented manner. Be My Eyes, for example, is a free mobile app that has built an online community for both sighted and visually impaired people. With the press of a button, visually impaired users can send a video call for help to more than sixty thousand registered sighted volunteers globally. The sighted volunteer, would 'lend' his/her eyes to the visually impaired users in managing a big or a small task ranging from reading food labels to finding matching socks.

3. British Standard 8878 Web accessibility code of practice (BS8878) must to reinforced in both public and private sectors.

This web accessibility code of practice was published by the British Standards Institution in 2010 and encompasses web sites, web

applications, software, cloud based services and other services accessed via a web browsers. It provides guidance for both public and private sectors on meeting the requirements of the Equality Act 2010 that states that web products must be accessible to all including those with physical impairments or learning difficulties.

From this survey, unfortunately, we identify various accessibility barriers to be overcome by blind and partially sighted people. We would like to emphasize the following with regards to web accessibility:

- Ensure that all websites are compatible with high contrast screen readers – contrast is an essential need for those with limited vision and, while colour schemes are often dictated by commercial branding, proper design of websites can support.
- Ensuring that touch controls are presented with alternate methods of control – there can be extreme difficulty when expanding/swipe maps as place names recede and get smaller.
- More options on keyboard colour screens – specific choices on colour can be useful for many individuals beyond the need for high contrast/well coded webpages.

4. We recommend a new technology design agenda to the industry in both public and private sectors.

From this survey, we identify a problem associated with technology design. Accessibility features embedded in devices can lag behind most mainstream software due to compatibility and functionality issues (Vanderheiden 2008). The industry tends to focus on the most active users who are usually having stronger purchasing power and higher level of digital literacy. While sensory impaired users are often overlooked in this market-driven and technology-oriented approach.

United Nations Convention on the Rights of Persons with Disabilities and Optional Protocol provides definition on of disability consists of the following words,

“The term persons with disabilities is used to apply to all persons with disabilities including those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various

attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others” (Article 1)

Disability is intrinsically determined by attitudinal and environmental barriers. Hence ‘disability now resides in the society not in the person’ (Yuill, et al. 2010: 167).

We recommend a new technology design agenda. Current technological solutions to providing access to disabled users are categorically labelled as ‘assistive technology’. The word ‘assistive’ has the connotation that such technology is designed to repurpose certain technological components found in ‘mainstream’ technologies so that they can compensate the lack for disabled users. Such a philosophy rooted in the ‘ideology of ability’ (Siebers 2008:7) and has already invited criticism. Scholars argue that these technologies ‘may become “stigma symbols” or they may serve purely cosmetic purposes to accommodate popular discomfort with difference’; and they may ‘draw attention to other wise “invisible” disabilities’, ‘assist users while “enforcing normalcy” for others’ (Mills 2015: 179). Alternative design approaches such as ‘resonant design’, ‘critical design’, ‘interrogative design’ and others were suggested. We would endorse what Graham Pullin (2009) suggests the ‘resonant design’ approach, which incorporates disabled and nondisabled users based on coincident needs. Voice-enabled phone, for example, can be an example as it offers both ‘hands-free’ and ‘eyes-free’ user experience (Pullin 2009:93).

Instead of focusing on technological capacity and market profit, we recommend a new technology design agenda to industries in both public and private sectors. Design should emphasize on users and tailor the technology capacity around the need of the user, even such design might look like low-tech and long-lasting. Ultimately, digital technologies should be used to improve the quality of life for people – disabled or non-disabled.

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7. Appendix: Digital Inclusion in Wales Survey for Sensory Impaired Users

(original copy was sent out in Large Print)

This survey is part of a project being run by Swansea University and in collaboration with the RNIB and Action on Hearing Loss Online. The intention of this survey is to ascertain what your engagement with, and experience of, digital technology is.

1. Your Age. Please choose only one answer:

- a. Under 16
- b. 16-24
- c. 25-34
- d. 35-44
- e. 45-54
- f. 55-64
- g. 65-74
- h. 75 +

Answer:

2. Your Gender. Please choose only one answer:

- a. Female
- b. Male
- c. Others
- d. Prefer not to say

Answer:

3. You are currently:

- a. Working full-time
- b. Working part-time
- c. Doing voluntary job
- d. Do not work
- e. Prefer not to say

Answer:

4. Which electoral region of Wales do you live in? Please choose only one of the following:

- a. North Wales
- b. South Wales West
- c. South Wales East

- d. Mid & West Wales
- e. South Wales Central
- f. Prefer not to say

Answer:

5. Your degree of sensory impairment? Please choose one or more of the following:

- 5.1 For people with sight loss:
- a. Sight impaired / Partially sighted
 - b. Severely sight impaired / Blind
 - c. Dual sensory loss
 - d. Other (please state)

Answer:

5.2 For people with dual sensory loss:

- a. I am deaf
- b. I am hard of hearing
- c. I use British Sign Language (BSL)
- d. I wear hearing aids
- e. I have cochlear implant
- g. I have Tinnitus
- i. Other (please state)

Answer:

6. Please provide information regarding the following digital device ownership and usage

	I own one	I don't own one, but can often access one in places other than home (e.g. public library)	I don't own one and have never or rarely used it
Desktop computer /Laptop computer			
Tablet (iPad, Android tablet, Synapptic, etc.)			
Smart Phone (iPhone, Android, Blackberry, etc.)			
Smart TV			
Other (please specify)			

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7. What assistive technologies do you use? Please choose as many options as are appropriate to you.

I don't use any	
Accessible Keyboard	
Accessible Mouse	
Screen magnification (e.g. Zoom, Supernova, Zoomtext)	
Voice recognition (e.g. Siri, Dragon Naturally Speaking)	
Specialist software (e.g. Guide, Synaptic)	
Screen Reader	
Hearing aid app (TextHear Personal, sbuble, notes, Next Generation Text, Signly, Padius)	
Amplified hearing aid compatible smartphone	
Other (Please specify)	

8. Which of the following online activities do you do? Please choose as many options as are appropriate to you.

Use a search engine to look for information	
Find a website you have visited before	
Download or save a file you found online	
Send a personal message via email	
Carefully make comments and share information online	
Buy items or services from a website	
Buy and install apps or software on a device	
Book appointments	
Access public service	
Apply for jobs	
Chatting online using Skype, Facetime or other video messaging tools	
Others (please specify)	

9. What are the main benefit digital media brings to you? Please choose as many options as are appropriate to you.

Closer and more contact with friends and family	
More independent living	

General wellbeing has improved	
More opportunities in education	
More opportunities in employment	
Improved ability to travel	
Knowing more about what is happening in local community	
Better at managing my money	
Better at choosing the most suitable and convenient media in communicating with others	
Other (Please specify)	

10. Which difficulties have you experienced? Please choose as many options as are appropriate to you.

10.1 For people with sight loss:

My screen reader doesn't work with the website	
I cannot appreciate images and photos online due to the lack of descriptive text	
Too much extraneous content such as advertisements on the website	
The accessibility features on my digital gadgets doesn't work with the website	
It takes me ages to find what I'm looking for	
It is difficult to fill in any online application forms	
Smartphone accessibility apps are too poor to use	
Others (please specify)	

10.2 For people with dual sensory loss:

I can't find subtitles on video streaming sites	
I have difficulties using video conferencing service due to feedback noise and poor audio & video synchronisation	
I have difficulties attending bilingual meetings when the talk switches between the English speaker and the Welsh interpreter	
I have difficulties hearing the sound from laptops and tablets	
I cannot connect my hearing aids to the devices I want to use	
Others (please specify)	

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11. What digital skills you would like to acquire or improve in the near future? Please choose as many options as are appropriate to you.

Search and find information online	
Communicate with family and friends	
Access digital public services	
Shop online	
Search and apply for jobs	
Create and upload original content online	
Protect personal data online	
Others (please specify)	

12. Where do you feel you can go for training and support to use or improve your digital media skills? Please choose as many options as are appropriate to you.

My family members and friends	
My employer	
Digital Skill Officers from Online Today team	
Library	
I don't know where to go	
Others (please specify)	

13. Do you have any other comments or suggestion to the Government or business regarding digital services for sight impaired and hearing impaired people in Wales?

14. If you would like to be entered into our prize draw for one of five £20 Boots vouchers for taking part in this survey, please enter your contact details:

Name:

Postal address:

Please return the completed questionnaire in the enclosed stamped-addressed envelope by:
31 March 2017.

Many thanks for taking part in this survey - we value your input greatly!

Data protection and informed consent

Information sharing Data gathered from this research will be used for academic purposes only. We may be required to present information to Swansea University, RNIB Online Today, or government officials, who are responsible for monitoring the safety and quality of this study. Research staff will protect your personal information closely so no one will be able to connect your responses and any other information that identifies you. Directly identifying information (e.g. names, addresses) will be safeguarded and maintained under controlled conditions. You will not be identified in any publication from this study.

Data Protection Your name and address will be added to the University database and used for University purposes only. These purposes may include, but are not limited to, mailing of additional information that we think may be of interest to you. If you would prefer not to be included on the database, please tick here