Resource Disability Portfolio Guide 7

Using Technology

Use Guide 7 to gain an understanding of how disabled people use technology in their daily lives and how services can be designed to support this.

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The Portfolio is published as a result of collaboration with a working party, which includes specialist consultants, and aims to support the elimination of discrimination in service provision. The views expressed in these guides are not necessarily those of Resource.

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Front cover:
A pencil can be as useful a tool for communication as the most sophisticated technology. Photo: www.budgetstockphoto.com

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Introduction

Whatever your role in a museum, archive or library, it is likely to involve technology in some way. New technologies such as computers and the internet have revolutionised our society. We are able to reach out to new audiences and deliver new and exciting services in ways which we would not have considered possible just ten years ago.

At the same time, technology has revolutionised the workplace in a whole variety of ways:

- A connection to the internet provides access to a whole world of information and resources.
- Your reception desk may already be using a computer to respond to customer queries.
- Your website may be the first point of contact with information about your services.
- You may be using an automated stock or collections-management system.
- Your staff may be using ICT extensively to carry out their work.

Technology has the power to make the inaccessible accessible. However, the inappropriate or incorrect use of technology can often lead to new barriers, or reinforce old ones. The purpose of this Guide is to show how you can go about using technology as a powerful tool for access.

The Kurzweil is a popular example of technology which helps make services accessible. A scanner recognises the words printed on a page while a text-to-speech engine translates them into spoken words. Photo: Pam Isherwood/Photofusion

1 Policies for accessible technology

The main legislation

The Disability Discrimination Act (DDA) 2005 (see Guide 5) is the main legislation governing the provision of services for people with disabilities.

Under the DDA, a service provider must make 'reasonable adjustments' and provide auxiliary aids to ensure that disabled people do not face unnecessary barriers to access. Accessible websites and technology are cited specifically as auxiliary aids in the Government's Code of Practice to the DDA.

Technology can assist you as a museum, archive or library in making these adjustments to meet the needs of your users. However, the use of technology should be proportionate and appropriate to your audience. Implementing systems can be expensive. It is necessary to establish a sensible balance between meeting user needs and acting responsibly as an organisation.

Acts such as the DDA are paving the way for a world in which barriers to access will be as unacceptable in the digital realm as they are in our buildings.

Alongside this legislation, developing standards such as the Web Accessibility Initiative www.w3c.org/WAI are making it easier than ever to ensure that we do not present unnecessary barriers to access. The Web Accessibility Initiative provides a series of technical standards and guidelines which will enhance the accessibility of online information.

The creation of an industry standard for the accessibility of digital materials has paved the way for tools which will automatically assess a website against defined criteria. More information about these is provided in chapter 4, ‘The internet’.

The legislation and guidance on accessibility and technology also form the basis of the e-Government agenda. The UK is committed to enabling access to the internet, providing training and skills and promoting digital citizenship. As part of this commitment, there is a requirement that all public-sector websites must meet accessibility standards by 2005 (see page 18). The online resources delivered as part of this work can and should be accessible to all citizens, irrespective of disability.

2 What do we mean by ‘technology’?

Human beings use tools in almost everything we do. We use tools because they allow us to solve problems, overcome our physical limitations and to interact with our environment in new ways. Technology can be defined as any tool which extends our capabilities in this way. A pencil is as much a piece of technology as an internet-connected computer.

This definition places the focus more on choosing the best tool for the job than on making use of cutting-edge technology simply because it is there. There are many cases in which different technologies can enable access or interaction for disabled people, for example:

- Provision of audible or touch alternatives for visually impaired people.
- Interactives configured to enable use by people with Learning Difficulties.
- Lifts and chairlifts for people with mobility impairments.
- Provision of alternative ways of finding and manipulating information.

Technology plays an important role in the lives of people with disabilities. For many, access mediated through technology is a vital form of contact with our information and services.

The concept of ‘inclusive’ technology consists of several parts:

- Adaptive technology.
- Communications aids.
- Technology tailored to meet specific requirements.

What is adaptive technology?

The term ‘adaptive technology’ is generally used to refer to anything which enhances the accessibility of a piece of technology for the user. The need to adapt technology in this way is universal. Accessibility is not limited to addressing the needs of disabled people.

Some examples of adaptive technology include:

- Screen readers and magnifiers.
- Alternative input devices.
- Alternative output devices.
- Alternative platforms for the delivery of content.

There are undoubtedly many ways in which technology can enhance the experience of disabled users. Choosing appropriate technologies which genuinely meet the needs of the people who are going to be using them is vital.

Adaptive technology and VAT

There are VAT rules which apply when selecting and purchasing adaptive technologies. A detailed description of the VAT allowances on technology for use by disabled people is provided on the HM Customs and Excise website at:

www.hmce.gov.uk/forms/notices/701-07.htm

You can also get further information by calling the national VAT helpline on 0845 010 9000 and requesting a copy of notice *'701/7 – VAT reliefs for disabled people'*.

In brief, the notice makes provision for VAT relief on technologies which have been designed specifically for use by disabled people and which are intended solely for this purpose. This does not extend to cover things like computers, but does cover accessible keyboards, software or other input devices, which may be zero-rated for VAT.

What is a communication aid?

A communication aid is any piece of technology which enables a user to communicate more effectively with others, for example:

- Internet-connected computer.
- Email.
- Telephone.
- Textphone (also known as a ‘Minicom’).

The National Health Service (NHS) has set up regional Communication Aid Centres which provide information, advice and guidance to disabled people in assessing their needs and suggesting technical solutions to meet them. These Centres can also provide advice to organisations looking to establish technical solutions for particular audiences. For further information, see www.doh.gov.uk/disabledguide/communication.htm.

3 Computers and disabled people

Computers, particularly when connected to the internet, can be hugely enabling tools for communication, interaction, productivity and creativity. However, this potential is frequently undermined by poor or thoughtless implementation of technology. There are three things to consider when thinking about computers for people with disabilities:

- Input devices – these include systems which allow the user to enter information into the computer such as keyboards, mice or trackballs.

- Output devices – these include systems by which information is communicated from the computer to the user such as printers, monitors or braille displays.

- Software – software describes a range of applications, from word-processing to spreadsheets, which allow you to interact with the information on the computer.

AbilityNet

AbilityNet is a charity specialising in accessible information and communication technology for disabled people. They have produced a series of factsheets on input and output devices which are available free of charge at www.abilitynet.org.uk.

Topics covered in the factsheets include:

- Computing and Learning Difficulties.
- IT and Special Educational Needs.
- Repetitive Strain Injury in the Workplace.
- Accessibility options in Windows.
- Funding for adapted systems.

AbilityNet have also put together a kit (cost £3,500) featuring items to make computer technology accessible for people with physical and sensory impairments. It includes different shaped and sized keyboards, mouse alternatives, lap-trays, wrist-rests, and screen magnifier, dyslexia and literacy software.

Meeting specific requirements

The following sections give an overview of things to remember when addressing the different requirements of disabled people:

- People with learning difficulties – computer technology for people with learning difficulties has to be individually tailored to the needs, requirements and competences of the person involved. Computers can be a valuable tool, but only alongside a learning strategy that supports an individual's overall development and needs.

  Key technologies: buttons/switches, keyboard overlays, structure and display of information.

- Visually impaired people – computers allow visually impaired users to access information in formats which directly meet their needs. One example would be the use of a text-to-speech reader to convert text content into an audio transcript for the user, and choice of font size and background colour.

  Key technologies: screen-readers, magnifiers, speech input software, monitors, Cascading Style Sheets (CSS).

- Deaf and hard-of-hearing people – computers enable many people who are deaf or hard-of-hearing to communicate. Technology is able to provide automated systems which convey not only the content, but also pitch, intonation and speed.

  Key technologies: audio interpretation software, tactile feedback systems, for example, vibrational.

- People with mobility impairments – adaptive technologies can often provide alternative ways of interacting with the computer for people with mobility impairments. For example, the use of simple buttons to control a computer gets round the need to be able to operate a mouse.

  Key technologies: buttons/switches, motion-sensing, joysticks or pads, adjustable furniture.

Selecting the right tool for the job

The technology we use must be appropriate to what we are trying to do. There is no sure-fire way to identify the right technologies, but doing so usually involves asking yourself some key questions:

- What do you need to do? (Goal)
- Why do you want to do it? (Rationale)
- Who are you doing it for? (Audience)
- What do they want to be able to do? (Need)
- What can you do? (Options)
- Who else has done something similar? (Experience)
- What can you afford to do? (Budget)
- Who are you going to work with? (Partners/suppliers)

The key principle is to ensure that the technology is proportionate to what you are trying to do and how it is going to be used.
For example, is it for personal use of an employee or use by visitors.
It is important to have a clear idea of the answers to these questions when approaching suppliers and drafting specifications.

4 The internet

The internet has revolutionised the way we publish, share, use and manage information. Its greatest strength lies in the fact that it is a global network shared by all. However, with this freedom comes responsibility. Increasingly, your online presence will be the first opportunity that people have to find out about who you are and what you do. We have a duty to ensure that this first contact adequately represents our values as a sector.

Users have had to find ways of making very fast choices between websites. The internet does present the opportunity to deliver our services to these new audiences, but we have to be aware of the context in which we are competing for their attention.

To make the most of this opportunity, we must address the issue of web accessibility.

What is web accessibility?

The provision of accessible web services is about delivering online information that is useful, informative, quality-assured and does not present unnecessary barriers. There are a number of important reasons to think about web accessibility:

- Use of the web is spreading rapidly into all areas of society.
- There are barriers on the web for many disabled people.
- Millions of people have disabilities that affect access to the web.
- Some websites are required to be accessible.
- Web accessibility also has carry-over benefits for other users.

(from: Web Accessibility Initiative presentation – www.w3c.org/WAI)

Two terms you may come across when thinking about web accessibility are ‘Universal Design’ and ‘Usability’. Information is available about both of these elsewhere, but the following is a short summary of what they are.

Universal design

Universal design is about building access for everyone, regardless of disability, into the process of designing and creating tools and information. This means that we should be thinking about enabling access to our online resources as one of the fundamental needs as we are building them.

In the past, we have tended to wait until a website has been built before we think about how to make it more accessible. While it is possible to add features to a website to improve interaction, it is better to have thought about these features from the very beginning of a project.

You can find out more about Universal Design at www.magda.org.uk/unidesign.html

Usability

There is an ongoing debate about the difference between usability and accessibility. The main difference is:

- Accessibility is about the technical processes of creating a website.
- Usability is about the ways in which users can interact with the site.

As these definitions show, they are both of equal importance.

The Web Accessibility Initiative

The World Wide Web Consortium (W3C) is the organisation which sets standards for the internet. One of its main areas of work is the Web Accessibility Initiative (WAI), which provides clear and straightforward guidance for people creating accessible sites. The WAI has provided Ten Quick Tips on web accessibility as well as a whole range of more detailed guidelines. These can be accessed at www.w3c.org/WAI and are listed opposite.

Their Guidelines on web accessibility are graded by importance – either Priority 1 (essential), 2 (good practice) or 3 (optional). Guidelines Conformance is then assessed at one of three levels:

- Level 1 – 'A' Conformance covers all the Priority 1 guidelines. This includes basic requirements such as alternative text (to visuals) and colour contrast without which your site may not be accessible.
- Level 2 – 'AA' Conformance covers all Priority 1 and 2 guidelines. This includes a slightly more complex set of requirements about how information is structured and set out on the page to make it more user friendly.
- Level 3 – 'AAA' Conformance covers all of the Priority 1, 2 and 3 guidelines. This includes a set of requirements about the context, overall structure and navigation of your website. Failure to meet Priority 3 guidelines will not prevent people from using the site, but may make it more difficult for them to do so.

E-government policies require that from 2005 public sector websites meet Level 2 guidelines. The W3C is due to publish a second edition of its Guidelines, which will define each Guideline as being either 'Core' (essential) or 'Extended' (good practice). Further information on this can be found on the website: www.w3c.org/WAI

Ten Tips for web accessibility by WAI

- Provide an alternative description of the content of pictures or animations.
- Provide a non-visual (i.e. text) means of interacting with clickable areas of the screen.
- Provide captions for audio content or text descriptions of video.
- Describe links in a way that makes sense out of context (i.e. avoid ‘click here’).
- Use a consistent structure to organise your web pages.
- Summarise the contents of graphs or charts.
- Provide an alternative way of accessing content that relies on additional software (e.g. Flash).
- Provide alternative ways of using content for people who can’t see frames.
- Ensure that content in tables makes sense when read across the page.
- Check your work to make sure that it is accessible and the code is written properly.

The main idea is to separate the content of your web pages from the way in which that content is presented. This means that if the layout and design elements of the pages are removed, users can still access the information they contain.

Royal National Institute of Blind People (RNIB)

RNIB is running a campaign called ‘See It Right’ which addresses a whole range of issues around web accessibility and visual impairment. You can access information about ‘See It Right’ at www.rnib.org.uk.

In addition to factsheets and booklets, RNIB is one of the services which audit websites for accessibility. These are charged services, but they can be invaluable in identifying issues with existing sites and proposing different ways of correcting them.

Buying an accessible website

Many museums, archives or libraries will not be building or running their own website. In many cases, you will be contracting a web designer to create and maintain the pages on your behalf. This can often lead to difficulties, particularly where the designers are unaware of best practice and technical standards for accessibility. The following are some key points to consider when drawing up an agreement with designers:

- Designers should have experience in creating accessible sites.
- Speak to previous clients about their experiences of the contractor.
- Clearly state web accessibility as a requirement in your design brief.
- Establish whether you have sufficient skills in-house to know whether a site is accessible.
- Specify a validation tool to be used in checking the site for accessibility.

Validation tools

'Validation' is the process of checking that the code of a web page meets the criteria set out in a given standard. In America, the standard is provided by Section 508 of the US Rehabilitation Act. In the UK, the standard is usually the Web Accessibility Initiative.

There are several automated tools which will check your website against the standard. These are usually free of charge and very simple to use. The main examples are:

- Bobby: There are two versions of Bobby, both of which will test your website against the WAI standard. The first one is online at http://bobby.watchfire.com, the second is a standalone product which you can buy from the same website.

- HTML-kit: HTML-kit is a free website editor with a whole range of features and functions which will enhance the accessibility of a website. While it can be slightly technical to use, it is a very effective tool. Bundled with the software is a tool called 'HTML-tidy' which will correct errors and inaccessible features in the code of a website. HTML-kit is available free of charge at www.chami.com/html-kit/

Validation tools test the code of your website to ensure that it has been written properly. Most will generate a report suggesting particular areas which you could address to enhance the accessibility of your website. It is important to remember though that validation tools are only really able to check the technical side of your website. They do not evaluate the content of the pages itself for access.

5 Other technologies

There are a number of other technologies which can help in enabling access to your services:

Induction Loop systems

An Induction Loop is a way of making it easier for hard-of-hearing people to use hearing aids in enclosed spaces. They can be used almost anywhere, but are particularly useful in places like lecture theatres, or anywhere sound has to travel some distance.

This is a loop of wire, an amplifier and a microphone or direct connection to the sound source. The microphone picks up sound and the amplifier converts this into magnetic waves, which are sent out by the loop, picked up by the T setting and converted back to sound. A deaf person using a hearing aid with a T switch can tune in to an audio frequency induction loop to make sound clearer and cut out background noise.

The Royal National Institute for Deaf People (RNID) has produced an excellent factsheet on Induction Loops, accessible at www.rnid.org.uk

Things to remember when considering an Induction Loop System:

- The system does not need to be very expensive (approx. £150 or less as part of a bulk purchase) but you may need to install specialist equipment.
- It is usually advisable to use a professional installation service.
- Loops can be installed in most locations, but there are some specific things which may make installation difficult. These can include the location of wiring and the shape of the space.
- A portable loop may be more suitable than a fixed one.

You can access information about different loop systems through the RNID's catalogue at www.rnid.org.uk/html/shop/home.htm

CCTV

Closed Circuit Television Magnifiers have a flat surface on which the material to be read is placed; it then appears on the screen above in large print. The size and colour contrast can be adjusted to suit the user.

It is also possible to buy a machine which will read out the content of material placed on the reading surface. A popular example of these machines is the Kurzweil. The Kurzweil effectively combines a scanner, software which recognises the words written on the page, and a text-to-speech engine. The system is simple and effective to use, and can greatly enhance accessibility for the user. Further information can be obtained from equipment suppliers.

Textphone

Many deaf or hard-of-hearing people use a Textphone (also sometimes known as a 'Minicom') to make and receive telephone calls. A Textphone consists of a keyboard and a screen. The user types what they want to say into the system, this is displayed on another Textphone at the other end of the line. The response is displayed on the screen.

It is also possible for someone with a Textphone to call someone who is using a voice telephone. This requires the use of a 'relay' service such as RNID Typetalk. The relay service will translate the Textphone input into speech and vice-versa.

Full details of how Textphone systems work are provided in an RNID factsheet at www.rnid.org.uk.

If a member of your staff is deaf and needs to use a Textphone system in the course of their work, you may be eligible for support under the Government's Access to Work Programme. To find out more about the Programme, you should consult the Disability Employment Adviser (DEA) through your local Job Centre.

Audioguides

An audioguide provides visitors with an audio soundtrack to accompany their visit to a museum or gallery. The soundtrack presents a selection of objects and places to the visitor in the gallery, delivered through a handset much like a mobile phone.

A common approach is to number the objects in a gallery. When the visitor comes to an object they are interested in, they can type the number into the Audioguide to access the description.

Where your organisation has limited resources, it is also possible to use standard audio tapes or CD players as Audioguides. However, more sophisticated equipment gives the user greater control over how they access the information.

Many organisations have made creative use of Audioguides. For example, the Pitt Rivers Museum in Oxford provides three different guides, tailored to the needs of their users. These are:

- A 'standard' guide providing an introduction to the collections and a description of highlights and objects of particular interest.
- A 'detailed' guide providing a higher level of description for visitors with visual impairments.

- A ‘conversation’ guide which provides a greater degree of access for people with Learning Difficulties or for whom English is a second language.

Finally, when providing audioguides, you should consider providing inductive loops on request for hard-of-hearing people. There is a lot of room for exploring approaches to audioguides which are inclusive of all visitors. For further information, refer to the Talking Images guide and report (see details in ‘Further Information’) and the RNIB for advice on user-friendly equipment, labelling and sinage.

Handheld computers

An interesting development of the audioguide is the use of handheld computers to provide access to a multimedia description of the contents of the collection. This description might include audio information alongside pictures, animations and web pages.

The benefit of this approach over a traditional audioguide is that it gives the user access to a much richer set of information about each object.

Recent trials have experimented with different ways of using handheld computers. You can find out more about these in an article entitled *The future in the palm of your hand*. www.museumscomputergroup.org.uk/newsletters/sept2002.htm.

While screen size prevents handhelds from being truly accessible for visually impaired people, they do provide a wealth of accessible features. A recent collaboration of Tate Modern and Antennaaudio piloted the use of handheld computers to provide information in British Sign Language.

Gallery interactives

For many visitors, a gallery interactive is an invaluable way of finding out more about your collections. Interactives come in an enormous variety of shapes and sizes. Many present sizeable barriers for disabled people, and therefore the design brief should consider the following:

- Location – where is the interactive located in the gallery?
- Height – can the height be adjusted for users in wheelchairs?
- Screen – does screen glare from overhead lighting reduce the visibility of the screen?
- Interface – can the users navigate through the interactive without a keyboard or mouse?
- Buttons – if the interactive is a touch-screen, are the buttons large enough to enable use?
- Braille – are buttons and notices presented in Braille as well as text?
- Control – can the user control the speed and presentation of animation?
- Noise – is the user able to hear the content over the ambient noise?

CD-ROM

For many users, access to the internet is still a slow and difficult process. CD-ROMs allow the presentation of rich multimedia information through a standard PC.

Many organisations have also used CD-ROMs to enable access. For example, it is possible to make a CD-ROM self-voicing so that the user can hear the content as well as read it.

When putting together a CD-ROM it is important to consider the access requirements of your audience and speak to your suppliers about the technical options to meet them.

Conclusion

Technology is playing an ever-increasing role both in our society and in our professional life. It offers us an almost bewildering range of opportunities and possibilities. But it is important always to remember that technology is only a tool, never an end in itself.

In order to make the most of what technology can offer us, we must adopt a pragmatic person-centred view. When considering how best we should solve the problems of access, we must always be aware of the technological possibilities, but not allow ourselves to be led by them.

Where we do make use of technology, it must always be in a way that directly addresses the needs of the user. It is worth also remembering that the effective use of technology requires a long-term approach. It must be integrated fully into what we do, instead of being seen as an additional area of work.

This guide has presented some of the issues surrounding the use of technology to enable access. There are many others. There are also many technologies not described here and new ones being developed. If you have enjoyed reading this Guide, and are keen to find out more about what is available and what you can do, use the links and resources in the ‘Further information’ section.

Further information

AbilityNet
AbilityNet provides a wide range of useful information about lots of different technologies and their application to access.
www.abilitynet.org.uk

Communications Centres
Communications Centres are able to provide information and advice to organisations who are implementing communications aids to enable access.
www.doh.gov.uk/disabledguide/communication.htm

Disability Rights Commission
The website of the Disability Rights Commission includes links to helpful information about access and technology, as well as guidelines for web accessibility.
www.drc-gb.org

e-Access Bulletin
The e-Access Bulleting provides a regular email update about all aspects of access and technology. The list is free to join and is an invaluable source of information.
www.e-accessibility.com

RNIB ‘See It Right’ Campaign
RNIB has provided a range of information and resources for people who are building websites. While the focus is on users with Visual Impairments, the advice is equally applicable to any user of online information.
www.rnib.org.uk/digital

Talking Images Guide: Museums, galleries and heritage sites – improving access for blind and partially sighted people (£ 9.95) and *Talking Images Research* (£5.95), RNIB/Vocaleyes, 2003. Available from RNIB.
Tel: 0845 702 3153
Email: cservices@rnib.org.uk

RNID 'website'
The 'Technology' section of the RNID website provides access to information about a range of technological products and services designed for people who are deaf or hard-of-hearing.
www.rnid.org.uk/html/information/technology/home.htm

TechDis
The TechDis service provides information and advice about access and technology in the Higher and Further Education sector.
www.techdis.ac.uk

UKOLN Quality Assurance Focus
Provides a range of factsheets covering all aspects of quality assurance and accessibility.
www.ukoln.ac.uk/qa-focus

Web Accessibility Initiative
Run by the World Wide Web Consortium, the Web Accessibility Initiative is leading the way in developing standards for accessible websites. This site contains useful guidelines as well as background information about disability and the Internet.
www.w3c.org/WAI

YourAble.com
A website dedicate to providing up-to-date information about a range of products and services for people with disabilities. Regular features include information about current policy developments and net technologies.
www.yourable.com

re:source

The Council for **Museums, Archives and Libraries**

1. Disability in Context
2. Meeting Disabled People
3. Training for Equality
4. Audits
5. Disability Discrimination Act (DDA)
6. Inclusive Information
7. Using Technology
8. Access on a Shoestring
9. Accessible Environments
10. Outreach and Partnerships
11. Consulting Disabled People
12. Employment at Every Level

The Disability Portfolio is a collection of 12 guides on how best to meet the needs of disabled people as users and staff in museums, archives and libraries. It gives invaluable advice, information and guidance to help overcome barriers and follow good practice.

The Portfolio is available in 12 point clear print or 15 point large print formats, braille, audio cassette and on the website. Please contact 020 7273 1458 or info@resource.gov.uk

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