

AbilityNet Factsheet – May 2019

Voice recognition

This factsheet provides an overview of how you can use voice recognition. It can be used to control smart homes, issue commands to phones and tablets, set reminders and interact hands free with personal technologies. The most significant use is for the entry of text without having to use an onscreen or physical keyboard.

Communication technology continues to evolve at a rapid pace. Using voice recognition to input text, check how words are spelled and to dictate messages has become very easy. Most on screen keyboards have a microphone icon which allows users to switch from typing to voice recognition very easily.

For some disabled people who might struggle, or find it impossible, to work with a mouse or keyboard, speech recognition enables a world of productive possibilities. It can free people from typing and keyboard use, helping those with physical impairments and reducing the risk of repetitive strain injury from excessive typing or mouse use. People with dyslexia can write more fluently, accurately and quickly using voice recognition and may find it less stressful than conventional handwriting or typing.

For employers, enabling voice recognition in systems and encouraging its use in the workplace can be a 'reasonable adjustment': preventing discrimination against, and maximising the productivity of, disabled staff.

Section 9 gives details of the services that AbilityNet provides to assist businesses, charities and individuals with identifying and realising the best possible solution for their particular situation and needs. Links to other helpful resources are given in Section 10.

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1 How can you control a computer with your voice?

Voice recognition is built into most devices where the hardware can support it so higher end phones and tablets will have good microphones which will support voice input. Similarly, computers often come with inbuilt cameras, microphones and speakers. Voice recognition can provide an alternative to typing on a keyboard. At its simplest, it provides a fast method of writing on a computer, tablet or smartphone. The user talks into an external microphone, headset or built-in microphone and their words appear as text on the screen. This might be in the text bar of a search engine, in a chat or messenger application, or in an email or document.

Some systems and programmes have voice recognition that can be set up to do more than input text. It can be used to control devices. Simple spoken commands with the right set up can start and shut down a computer and open and run different programmes and applications. This is highly significant for people with physical disabilities who can use their devices independently just using voice commands. If the voice recognition can be customised and has settings it can be used to carry out commands such as

- Formatting text and saving it
- Printing and sending documents
- Not only writing but sending email
- Browsing the web and completing forms

Quite powerful voice recognition programmes are now built into new computers, tablets and smartphones. But to gain a high level of control and functionality it can be necessary to pay for specialist software depending on the system or device.

2 Who can voice recognition software help?

Voice recognition offers significant benefits to a wide variety of potential users. Most obviously, it is extremely useful for anyone with a physical disability who finds typing difficult, painful or impossible. Additionally, it can help to reduce the risk of getting a repetitive strain injury (RSI) or to manage any such upper limb disorder more effectively.

Voice recognition programmes can also greatly benefit people with dyslexia who would otherwise struggle with spellings and/or structuring sentences correctly.

More generally, voice recognition can help to make mobile working easier, as well as offering potential productivity benefits to anyone who might not be very proficient at typing. In fact, most people can talk much faster than they can type accurately – while ‘hands-free’ computing also offers additional scope for multi-tasking.

3 What are the benefits to employers?

Making appropriate use of voice recognition software can help employers to meet their legal ‘duty of care’ to ensure the health, safety and welfare at work of their staff. Employers must take action to minimise the risk of illness or injury to their employees including through, for example, RSI. Voice recognition software helps prevent fatigue and injury by offering a comfortable, ergonomic alternative to the keyboard and mouse.

Employers who do not meet their statutory responsibilities for health and safety may be taken to an employment tribunal. They could also be vulnerable to claims of discrimination under the Equality Act, if they failed to make ‘reasonable adjustments’ for their disabled employees. Utilising voice recognition is a very straightforward and cost-effective adjustment that an employer can make to give a disabled member of staff equal access to everything involved in doing and keeping their job as a non-disabled employee.

Aside from concerns regarding health and safety or discrimination, employers should consider the potential efficiency and productivity gains that could be achieved by deploying voice recognition more widely, particularly for staff working ‘on the move.’

4 How does voice recognition software work?

Voice recognition programmes work by analysing sounds and converting these to text. The software draws on a vast vocabulary and a knowledge of how English is spoken to determine what the speaker most probably said. In some programmes specialist vocabulary or frequently used words such as names can be added through giving it documents, word lists, or using 3rd party plugins.

Recording your voice

Voice recognition software captures and converts speech via a microphone. Some computers include built-in microphones, but most specialist voice recognition programmes also include a microphone headset. This can be

connected to the computer, either through its soundcard socket or via a USB (or similar) connection.

It is also possible to use a suitable hand-held digital recorder to dictate recordings – something that may be especially useful for mobile working. Some voice recognition applications can transcribe recordings from a number of formats (including wav, mp3 and wma).

Enrolment

Everyone's voice and phrasing sounds slightly different, so the most effective programme uses a simple, one-off process called 'enrolment'. This only takes a minute and simply involves reading a short text of a few lines. However, not all most recognition software uses enrolment, but may require the user to say if they have an accent and to choose which one.

5 What can you do with voice recognition software?

Dictating and correcting

When talking, people often hesitate, mumble or slur their words. One of the key skills in using voice recognition software is learning how to talk clearly so that the computer or device can recognise what is being said. It can help to plan what to say and then to speak in complete phrases or sentences. Voice recognition software can misunderstand some of the words spoken, and may put in similar sounding words so it can be important to proof read carefully.

While voice recognition software is improving all the time, the error rate can still be quite high. If corrections are made using voice recognition software either by voice or by typing it can adapt and learn so that, hopefully, the same mistake will not occur again. It can be possible to achieve very high levels of accuracy with careful dictation and correction and perseverance.

Text to speech

Some applications, including *Dragon Professional* provide a text-to-speech option (for listening back to the text file that's been created) and, also, audio playback of the speech (this means that the two can be compared so what was actually said with the software-generated text).

The text-to-speech facility is especially useful for people with a sight impairment (who would find it difficult or impossible to read any text file) and for anyone with dyslexia.

Details of some specialist text-to-speech programmes are given in Section 10.

6 What voice recognition software is available?

Windows Speech Recognition

Microsoft Windows has an inbuilt voice recognition programme called *Speech Recognition*. In Windows 10 this allows users to control the computer with voice commands. It can be set up and used to do things such as navigate, open and close applications and dictate text. It is accessed through the control Panel and 'Ease of Access'. Microsoft recommends headset microphones or microphone arrays. It requires users to go through an enrolment. Anyone can use this feature. It was designed to help people with disabilities who can't use a mouse or keyboard.

www.windowscentral.com/how-set-speech-recognition-windows-10

Dictation on a Mac

Apple Mac computers running OS X Mountain Lion, Mavericks or Yosemite also provide free built-in dictation software. This can be accessed through the 'Dictation and Speech' panel within System Preferences.

In later OS versions El Capitan (11) Sierra and High Sierra 12/13 Mojave (14) Dictation can be set up through system preferences, Keyboard and the option for Dictation. Enhanced dictation enables the user to work offline.

In MacOS Sierra it is possible to ask Siri to 'turn on dictation'. This isn't the same as the built-in dictation software but Siri can compose short text and email messages.

In OS after Mavericks turning on 'Enhanced Dictation' enables continuous speech recognition and offline processing. Yosemite onwards introduced many new editing and formatting commands. and the ability to create additional dictation commands. The formatting commands are all present in Mojave.

support.apple.com/en-gb/HT202584

Google Speech Recognition

Google speech recognition uses a different neural network architecture which was completely rebuilt. It is free and Google are continuing to develop and work on it. It doesn't need enrolment and is considered 'Speaker independent'.

Speech recognition is available on Android devices, in Google apps such as Keep and in Google docs using the Add-ons Speech Sound writer. This is not the same as the Google assistant.

There are some limited settings and formatting commands and the recognition rate is high dependent on hardware quality and background noise.

cloud.google.com/text-to-speech/

efv-solutions.com/speech-recognition-sound-writer-for-google-docs/

Dragon Individual Professional

Produced by Nuance, *Dragon Professional Individual* is the market-leading voice recognition software for Microsoft Windows computers. Nuance produce a version for mobile devices called Dragon Anywhere which is available on a subscription basis. The software and app version do not come together.

Nuance announced via a press release on the 22/10/2018 that they had discontinued Dragon and any voice recognition software for Mac and would no longer provide updates for it beyond this date. Mac users can use the software only by using bootcamp or a virtual machine such as Parallels desktop and would also need a licence for a Windows operating system.

Nuance claim that using their Dragon voice recognition works three times faster than typing and achieves 99% accuracy.

Dragon on Windows can be highly customised. It can be used in different language versions and with plugins to provide specialist vocabularies such as medical, legal, geographical and engineering.

It can be used to dictate text, format and correct it and to navigate the computer and control work flows and perform most functions. There are native applications where its full functionality can be used. There are some 3rd party applications where it won't work.

Additional features offered are important for the workplace and include the ability to:

- create spreadsheets and presentations using *Excel* and *PowerPoint*
- Offer transcription from recordings
- create custom commands and scripts to insert frequently used text and automate repeated tasks.

For more information and to purchase the Dragon software, visit www.nuance.co.uk/dragon/index.htm

7 What about tablets and smartphones?

Intelligent personal assistants are an important feature of all modern tablets and smartphones. They use voice recognition technology and a natural language user interface to provide a range of services. Some of the most popular personal assistants include:

- *Siri* – for iOS devices (iPads and iPhones)
- *Google Now*- for iOS devices, integrated into the browser for Android and Chromebooks.
- *Cortana* – for Windows devices.
- *Alexa* -Amazon Echo

These personal assistants offer similar features to help with everyday tasks – responding to voice commands and requests to provide information and answer queries (through online sources), send messages and emails, make phone calls, take notes, schedule meetings, and play music.

8 How important is training?

Training is really useful for users to realise the full benefits of working with voice recognition programmes. To get the best from training, it can be helpful to spread it out over a period of weeks – giving the user sufficient opportunity to practice new skills and consolidate their learning between formal coaching sessions.

Training will be most effective when it geared towards the specific needs of the individual, focusing on their particular tasks and challenges. Specialist vocabularies can be attained by using plugins or by giving the programme access to emails and documents.

A wide range of private and voluntary organisations offer computer training services. The AbilityNet factsheet on *Technical help and training resources* gives contact details for many organisations that provide ICT training and support for disabled people.

Apple provides tutorials and guidance on setting dictation on the Mac support.apple.com/en-gb/HT202584

Windows provides tutorials for their voice recognition support.microsoft.com/en-gb/help/17208/windows-10-use-speech-recognition

Nuance provide extensive tutorials and support for their Dragon products at www.nuance.co.uk/support/dragon-naturallyspeaking/index.htm

A wealth of free training resources is also available online, including on *YouTube*.

9 How can AbilityNet help you find the best solution?

AbilityNet is a leading authority on accessibility and assistive technologies. We can assist individuals, charities and employers by providing:

- advice and information
- workplace assessments
- consultancy services.

Our Workplace Assessment Service

This factsheet presents an overview of the main options for using your voice to dictate to and control a computer, tablet or smartphone. However, it cannot make tailored recommendations to suit each individual's particular needs – and voice recognition software may often only form part of the solution.

AbilityNet's Workplace Assessment Service provides a one-to-one holistic review. This not only looks at how your computer hardware and software is currently set up, it will also consider your working patterns and relationships, the requirements of your role, regular tasks and any other factors which can impact on health and productivity.

One size does not fit all. We believe that each case is unique and that individual attention is vital. Superficially similar cases may demand quite different approaches, and the solutions we propose are arrived at through discussion, evaluation of all the relevant circumstances and the trial use of alternative devices (where these are recommended).

Our assessments integrate personal and technical considerations to arrive at sound and realistic suggestions, documented in a report. To find out more about our Workplace Assessment Service, please visit www.abilitynet.org.uk/workplace or call 01926 465 247.

Consultancy services

Our expert consultants are also available to assist employers who wish to take a broad, longer-term view in designing computer systems and associated work

processes. Our experience and expertise can help you to achieve safe, healthy and productive working procedures.

To find out more about AbilityNet's consultancy services, call 01962 465 247 or email sales@abilitynet.org.uk

DSA/Student Assessments

If you have a disability and are in higher or further education, you may qualify for a Disabled Students Allowance (DSA). If you are eligible you will receive a free assessment and may qualify for a grant towards any adjustments that you might require. This could help with the costs of buying a new computer or any other specialist equipment you might need.

For information, please visit www.abilitynet.org.uk/dsa or call 01926 464 095.

10 Other useful links and resources

My Computer My Way

It is essential that your computing equipment is set up to suit your particular needs, especially if your capability may be affected by some kind of impairment.

My Computer My Way can help you achieve your optimum setup. It is a free, interactive tool developed by AbilityNet that makes any computer, tablet and smartphone easier to use. It covers all the accessibility features – including voice recognition – built into your computer, laptop, tablet or smartphone, and all the main operating systems – Windows, Mac OS X, iOS and Android.

My Computer My Way shows you how best to adjust your computer to assist with:

- vision impairment – help seeing your screen
- hearing difficulties – help with sounds and audio
- motor issues – help with your keyboard and mouse
- cognitive problems – help with reading, spelling and understanding.

You can use it for free at mcmw.abilitynet.org.uk

AbilityNet factsheets

AbilityNet's library of factsheets provides an extensive range of practical advice about specific conditions and the hardware and software adaptations that can help people of any age use computers to fulfil their potential.

Relevant topics covered include:

- *Dyslexia and computing*
- *Visual impairment and computing*
- *Repetitive strain injury (RSI) in the workplace*
- *Keyboard and mouse adaptations*
- *Technical help and training resources*
- and many more.

All factsheets are free to download from www.abilitynet.org.uk/factsheets

Text-to-speech software

Three very good screen-reading programmes (available for both PC and Mac) worth considering are:

- *ClaroRead* – available at www.clarosoftware.com
- *NaturalReader* – available at www.naturalreaders.com
- *Read&Write* – available at www.texthelp.com/en-gb

These programmes are all moderately priced, with a free version of *NaturalReader* also being available.

11 About AbilityNet

AbilityNet is the national charity that supports people with any disability, of any age. Our specialist services help disabled people to use computers and the internet to improve their lives, whether at work, at home or in education. We offer:

- free advice and information
- accessibility services
- DSA/student assessments
- workplace assessments
- IT help at home
- IT volunteers.

Support us

Visit www.abilitynet.org.uk/donate to learn how you can support our work.

Contact us

- Telephone 0800 269 545
- Email enquiries@abilitynet.org.uk
- Web: www.abilitynet.org.uk

We are always keen to help share knowledge about accessibility and assistive technology. If you have any questions about how you may use the contents of this factsheet, please contact us at AbilityNet and we will do all we can to help.

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