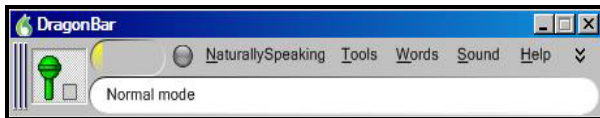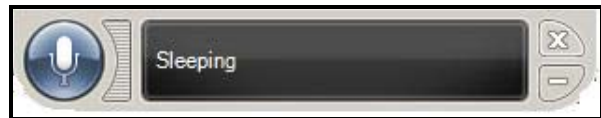# Voice-Recognition Software – Advanced Features and Concepts

In this factsheet, the features of two versions of voice-recognition software are described and compared. If you have not done so already, you should first read the factsheet 'Voice-Recognition Software – An Introduction', which gives an overview of the subject.

The applications described here are Dragon NaturallySpeaking and the Speech Recognition feature of Windows Vista (which is also included with Windows 7).

Dragon NaturallySpeaking 'Dragon Bar'

Vista Speech Recognition User Interface

Features Explained

Vocabularies

Both Dragon NaturallySpeaking and Windows Vista Speech Recognition match the words they hear to a list of words stored in the software's vocabulary. These vocabularies are accessed to produce the transcribed text as the user dictates to the computer. The vocabularies are used to correct misrecognised words. The number of words held in the vocabulary is huge. In the case of Dragon NaturallySpeaking, the full vocabulary can include more than 300,000 words.

Personalising the Vocabulary

As corrections are made, the vocabulary will increase to reflect the addition of new words (for example, technical terms and people's surnames). The accurate correction of misrecognition is key to improving the user's voice-recognition experience. Simply editing misrecognised text will not improve recognition accuracy over time.

A number of tools built in to both Dragon NaturallySpeaking and Windows Vista Speech Recognition can be used to add to the vocabulary. The user is able to:

- add individual words

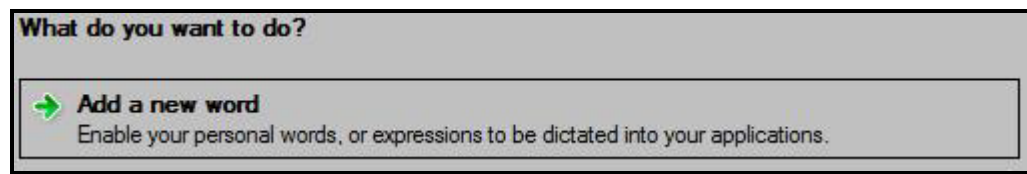- add lists of words (Dragon NaturallySpeaking only)

- analyse entire documents and e-mail accounts to increase the available vocabulary

Both Dragon NaturallySpeaking and Windows Vista Speech Recognition include the option to add words as individual misrecognised words. For example, if the word 'misrecognised' is initially transcribed as 'Miss recognised' and 'misrecognised' does not exist in the software vocabulary, correcting using the 'Spell' window will add the word 'misrecognised' to the vocabulary. Words can also be deleted from vocabularies.

Example: Using Windows Vista Speech Recognition to add a new word to the vocabulary

Right-click the user interface and choose 'Open Speech Dictionary'.

Once the Speech Dictionary Wizard starts, click 'Add a new word'.

On the following screen, type the new word in the 'Word or Expression' field.

Click 'Next'.

To record the pronunciation of the word, on the following screen tick the 'Record a pronunciation upon Finish' box. There are additional options on this screen for selecting the correct capitalisation for the new word.

On the following screen, click 'Record' to record for Speech Recognition.

Click 'Finish'.

From now on, when using Speech Recognition, the word will be recognised.

Recorded Speech

Recognition accuracy in both applications can reach a percentage in the high 90s, but there can be occasions when it is necessary to compare what was dictated with the transcribed text on the screen. This helps when correcting misrecognition and amending mispronunciation. Both programmes can use recorded speech to offer the user an audible confirmation of the words they have dictated. The actual words spoken can be compared with the text on screen.

Vista offers a 'play audible feedback' option when text is selected, while Dragon has an 'automatic playback on correction' feature available via the 'Options' menu. The result is the same in both applications; as soon as a correction command is used for a word or phrase, the words are played to the user in their own voice. The major difference is the availability of the 'Play That Back' feature in Dragon NaturallySpeaking. Text can be selected (a single word or entire paragraphs) and replayed in the user's voice.

Text-to-Speech

With Dragon NaturallySpeaking, text can be listened to using the synthesised text-to-speech engine. Text-to-speech is useful for proofreading. The major difference between Dragon and Vista is the availability of text-to-speech in Dragon NaturallySpeaking compared to Windows Vista Speech Recognition.

It is possible to access Dragon text-to-speech using one command; typical commands include "Read Paragraph", "Read That" and "Read Down From Here". To access text-to-speech in Vista involves starting Narrator, tweaking the settings and knowing which keyboard shortcuts to use. Furthermore, Dragon's text-to-speech feature will consistently read from Microsoft Word, whereas you may find it necessary to copy text into Notepad if you want to listen to text using Narrator.

Dragon NaturallySpeaking's 'Sound' menu

Natural Language Commands

Rather than having to use logical steps involving multiple menu selections, Natural Language Commands make it possible to say what you want by using a flexible, more

natural command syntax. Dragon NaturallySpeaking incorporates large command sets that make it easier to control applications and manipulate text; there is little command flexibility built in to Windows Vista.

As there are thousands of Natural Language Commands options, it is often worth taking a guess at a command such as "Indent this line by 3cm" (a command that will work in Microsoft Word using Dragon NaturallySpeaking) to see what will happen.
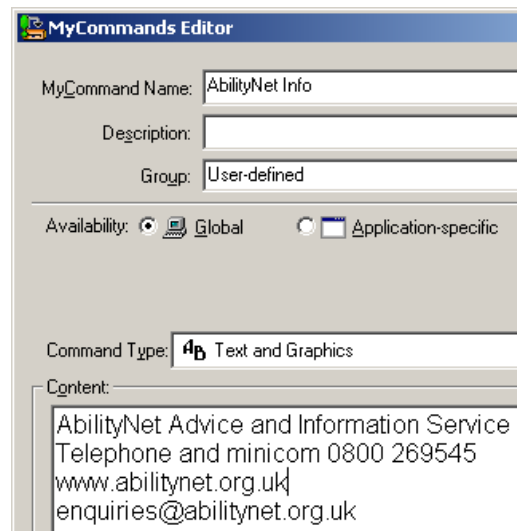
Examples of formatting commands available in Dragon NaturallySpeaking for use in Microsoft Word include: "Bold this paragraph," "Bullet the rest of the page," "Make it Arial," and "Move this up two lines."
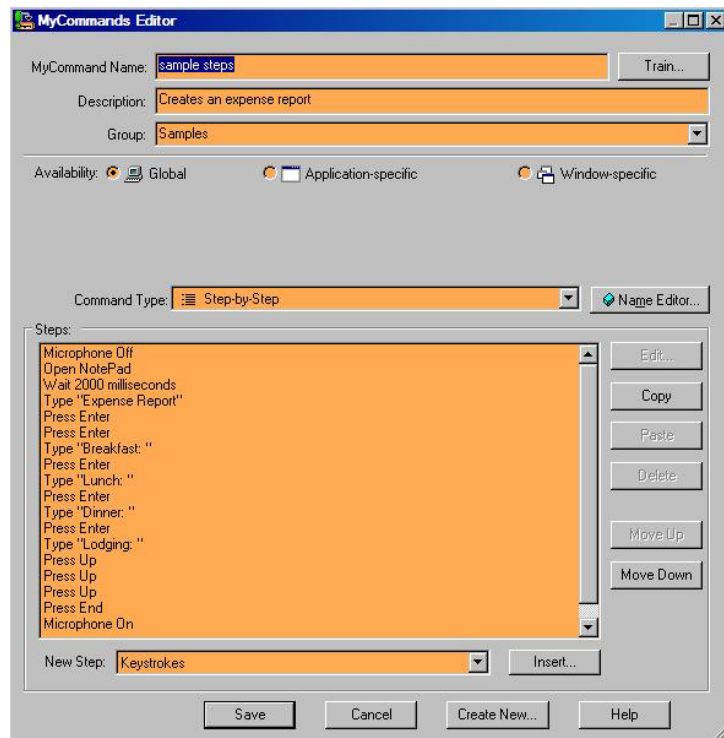
Dragon NaturallySpeaking now includes quick voice commands that offer the opportunity to quickly move from the current task to, for example, an Internet search based on a particular subject. As an example, saying "Search the web for voice recognition" while you are working in Microsoft Word will launch the default web browser and search for the subject stated in the command. Similarly, saying "Send an e-mail to John Smith" will launch your e-mail programme, open a new email and place the recipient's name in the 'To' field.

Dictation Shortcuts, Text Macros and Scripting

When writing, people often make use of standard phrases or paragraphs. Such strings of text can be stored in Dragon NaturallySpeaking and, once stored, they can be typed out in full by saying a short command. The facility to add text macros in Vista has been available since 2008, with the release of Windows Speech Recognition Macros (or WSR Macros). This tool is available as a free download from Microsoft.

In this example from Dragon NaturallySpeaking, saying "AbilityNet Info" will result in the contact information being entered into the document.

Dragon NaturallySpeaking Professional includes 'step-by-step' scripting. This provides options for creating commands to automate often repeated tasks, automate tasks in 'non-standard' applications and other functions. This offers a relatively simple way of automating a multi-step task without the need to learn the scripting rules of the advanced scripting tool.

Dragon NaturallySpeaking also includes macro and advanced scripting tools. Advanced scripting (written using XML) is also available in the Windows Speech Recognition Macros tool. Both require some programming knowledge or the willingness and ability to learn the scripting languages.

'Select and Say' Dictation

Both of the programmes detailed in this factsheet make it possible to dictate, edit and correct by voice in Microsoft Word. Words can be selected simply by saying "Select," followed by the word. Dictating 'over the top' of selected text is quicker and easier using Dragon NaturallySpeaking; you simply dictate the word or words you require after selecting the text. Using Windows Vista Speech Recognition involves selecting the text and then picking the new text from an 'Alternates' panel.

It is not possible to use 'select and say' dictation in all programmes. Sometimes it is necessary to dictate into a 'well-behaved' word processor and then transfer the corrected dictation. Dragon NaturallySpeaking includes a basic word processor, the DragonPad, and also the 'Dictation Box'. The Dictation Box offers a blank window into which the user dictates and corrects. A single command transfers the dictated text into a pre-selected edit field in another application.

Delegated Correction

Some people will find it helpful to dictate work and then ask someone else to make corrections for them at a later time. To do this, they need to be able to save their recorded speech with the documents they have created. This facility is only available in Dragon NaturallySpeaking Professional edition. With dictation saved to a file, an assistant can load the files later, listen to what was said and make corrections.

Recent versions of Dragon NaturallySpeaking include the Auto Transcribe Folder Agent. This tool automatically detects files to transcribe from one folder to another once a recording device is detected (see details of recording devices below). This provides a further option for third-party correction once automatic transcription has created the text.

Working on the Move

Voice-recognition software can be installed and used on lightweight laptop computers and, increasingly, on smart phones. A portable specialist option is available by using a hand-held recording device; digital recorders, such as those available from Olympus, Phillips and Sony, among other manufacturers, can be used to dictate and store recordings. Recordings can be transcribed from a number of formats, including .wav, .wma and .mp3. If you are considering the use of a recording device, bear the following points in mind.

- Seek advice from a specialist supplier; not all devices are suitable.

- Remember that a clear and confident dictation style is needed, using commands recognised by the software.

- Only use a recording of an individual's dictation. The software described here will not transcribe the content of a meeting or a lecture.

Hands-Free Facilities

People who have little or no use of their hands but have clear speech can use a computer entirely by voice. A hands-free user will need to have the following:

- the software running at start-up (available with Dragon NaturallySpeaking and Windows Vista Speech Recognition).

- the microphone listening when the software launches; both programmes can start with a microphone listening out for commands. Voice-recognition users will often begin with the microphone on but 'asleep'. Once the programme has loaded, the user can simply say a command to 'wake up' the microphone.

- the knowledge to make corrections by voice.

- knowledge of the commands required to select menus and launch programmes.

- mouse control available using the voice. Both Dragon NaturallySpeaking and Windows Vista Speech Recognition offer slightly different ways of achieving this, by means of a 'mouse grid'. This feature superimposes a grid of nine squares on the screen; through a series of commands, the user homes in on an area of the screen to reposition the pointer. NaturallySpeaking also includes commands such as "Move mouse right," "Mouse double-click" and "Mouse up 10."
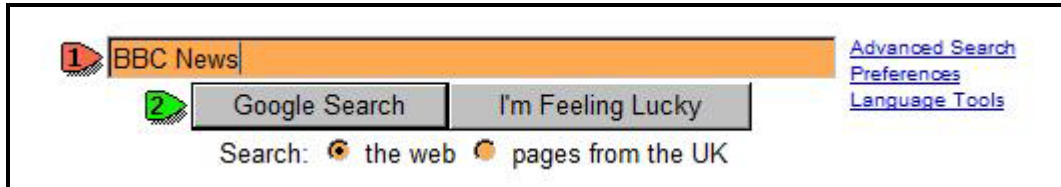

Windows Vista mouse grid – from left to right: 'homing in' on an area of the screen

- Internet navigation by voice. Both programmes cater for voice-activated Internet browsing. Dragon NaturallySpeaking supports the use of Internet Explorer and Mozilla Firefox. Windows Vista Speech Recognition is compatible with Internet Explorer but is a little slower with other browsers; however, most applications can be used with Windows Vista Speech Recognition through the 'Show Numbers' command.
- the ability to perform the equivalent of key presses without touching the keyboard. Both offer the option of sending individual keystrokes to the computer using voice commands. For example, "Press Shift Enter."

Example: Using Dragon NaturallySpeaking to browse within Internet Explorer

With the microphone awake, say "Start Internet Explorer."

Once the home page is displayed, dictate your search criteria.

In the example above, saying "Google Search" applies a number to any item on screen with that title. In this example, saying "Choose 2" is equivalent to clicking the 'Google Search' button.

By dictating 'unique' text on a webpage (i.e. a word or words only found in one link) Dragon NaturallySpeaking will automatically click that link without showing numbers against links.

The "Click link" command will apply a number to every link on a webpage. It is then simply a matter of saying "Choose 7", "Choose 8", etc to select the link you want.

Comparison of Popular Systems

Vocabulary Tools

	Dragon Naturally-Speaking (Preferred Version 9)	Dragon Naturally-Speaking (Professional Version 9)	Windows Vista Speech Recognition
Natural Language Commands	Available for DragonPad, Excel, Internet Explorer, Outlook Express, Word, WordPerfect	Available for DragonPad, Excel, Internet Explorer, Outlook, PowerPoint, Word, WordPerfect; plus navigation commands for Lotus Notes and Outlook	No
Text Macros	Yes	Yes	Yes – by downloading WSR Macros
Command Macros	No	Yes – requires some programming knowledge	Yes – by downloading WSR Macros; requires some programming knowledge
Text to Speech	Yes – RealSpeak	Yes – RealSpeak	Limited, using Windows Narrator
Dictation Playback	Yes	Yes	No
Delegated Correction (saving audio with text dictation)	No	Yes	No
Mobile recorder support	Yes	Yes	No
Microphone supplied	Yes – Headset	Yes – Headset	No

Hands-Free Facilities

	Dragon Naturally-Speaking (Preferred Version 9)	Dragon Naturally-Speaking (Professional Version 9)	Windows Vista Speech Recognition
Microphone listening at startup	Yes*	Yes*	Yes*
Hands-free correction and editing in own word-processor	Yes – DragonPad	Yes – DragonPad	No
Hands-free correction and editing in Microsoft Word	Yes	Yes	Yes
Control desktop and applications menus by voice	Yes	Yes	Yes
Move the mouse by voice	Yes	Yes	Yes
Navigate the Internet by voice	Yes – Internet Explorer, Mozilla Firefox	Yes – Internet Explorer, Mozilla Firefox	Yes – Internet Explorer only
Mouse movement by voice	Yes	Yes	No
Press keys by voice	Yes	Yes	Not all – but can be added using WSR Macros

* this needs to be set as an option in each programme

The choice of product will largely depend on the degree to which the user will be relying on their voice-recognition software, as noted below:

Requirement	Product
To overcome difficulties with spelling	Dragon NaturallySpeaking 'Preferred Version' or Windows Vista Speech Recognition
To help reduce keyboard/mouse use	Dragon NaturallySpeaking 'Preferred Version' or Windows Vista Speech Recognition
Hands-free use	Dragon NaturallySpeaking 'Professional Version'
Business users wishing to limit keyboarding and use Outlook by voice	Dragon NaturallySpeaking 'Professional Version'

Useful Factsheets

The following factsheets are also available:

- Voice-Recognition Software – An Introduction
- Dyslexia and Voice-Recognition Software

Notes:
- This factsheet has been developed through a partnership between My web my way (www.bbc.co.uk/accessibility) and AbilityNet, a UK computing and disability charity.
- Although this factsheet lists the producer (manufacturer or publisher) for specific products, this is for informational purposes, especially as the features of software applications can change in a short period of time. Most of these products are available from a variety of retailers specialising in accessibility-related products, and may in some cases also be available from general software and computer retailers.
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