



Speech Recognition Software, How it is Used, and What You Should Know About When Authoring Web Content

March 19, 2015

Presented by

Jonathan Avila

Chief Accessibility Officer – SSB BART

The Session begins at 1:00 pm CST

We will be testing audio quality periodically

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Useful Keyboard Shortcuts

- Full list - Keyboard Shortcuts from the Help menu on the Menu Bar.
- Speaker level Up:
 - Windows: Ctrl+Alt+Up Arrow
 - Mac: Command-Option-Up Arrow
- Speaker level Down:
 - Windows: Ctrl+Alt+Down Arrow
 - Mac: Command-Option-Down Arrow
- Chat: Move cursor to the Message text box
 - Windows: Ctrl+M
 - Mac: Command-M

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More keyboard shortcuts

- Open Closed-Captioning window
 - Windows: Ctrl+F8
 - Mac: Command-F8
- Close Closed-Captioning window
 - Windows: Alt+F4 or Ctrl+W
 - Mac: Command-W

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Listening to the Webinar

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- You can control the audio broadcast via the Audio & Video panel. You can adjust the sound by "sliding" the sound bar left or right.
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Listening to the Webinar, *continued*

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Listening to the Webinar, *continued*

MOBILE Devices supported include iPhone, iPad, Android Devices, Kindle Fire HD)**

Individuals can download the free Blackboard Collaborate App from the Apple Store, Google Play or Amazon



**Closed Captioning is not visible via the Mobile App and there is limited access to the white board for individual's using voice over technology

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Captioning

- Real-time captioning is provided during this webinar.
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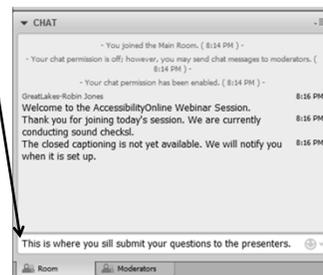


- Once selected you will have the option to resize the captioning window, change the font size and save the transcript.

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- You may type and submit questions in the Chat Area Text Box or press Control-M and enter text in the Chat Area
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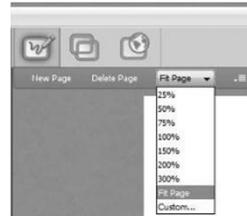


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Customize Your View

- Resize the Whiteboard where the Presentation slides are shown to make it smaller or larger by choosing from the drop down menu located above and to the left of the whiteboard. The default is “fit page”



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Customize Your View *continued*

- Resize/Reposition the Chat, Participant and Audio & Video panels by “detaching” and using your mouse to reposition or “stretch/shrink”. Each panel may be detached using the  icon in the upper right corner of each panel.

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Setting Preferences

- Depending on your system settings you may receive visual and audible notifications when individuals enter/leave the webinar room or when other actions are taken by participants. This can be distracting.
- To turn off notifications (audible/visual)
 - Select “Edit” from the tool bar at the top of your screen
 - From the drop down menu select “Preferences”
 - Scroll down to “General”
 - select “Audible Notifications” Uncheck anything you don’t want to receive and “apply”
 - Select “Visual Notifications” Uncheck anything you don’t want to receive and “apply”
 - For Screen Reader User – Set preferences through the setting options within the Activity Window (Ctrl+slash opens the activity window)

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Agenda

- Overview
- What is Speech Recognition?
- Who Benefits from Speech Recognition?
- Features
- Supported Platforms
- Sample Speech Commands
- Using Speech Recognition on the web
- Designing Websites for Speech Recognition
- ARIA and Speech Recognition
- Resources



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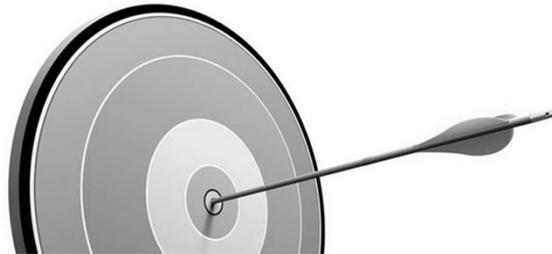
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Course Objectives

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- List the people who use or may benefit from speech recognition software
- Describe the main features of speech recognition software
- Explain what techniques to use to ensure accessible web access by users of speech recognition



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What is Speech Recognition?

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Converts spoken words into text used for:

- Dictation and/or
 - Type emails and write documents; fill out forms
- Command and control
 - Browse the web; control your computer



May require training to learn speaker's voice and commonly used words

- More accurate with training and scanning of words you use most.

May be speaker independent

- Less accurate
- May have limited set of commands of dictation
- May be cloud based



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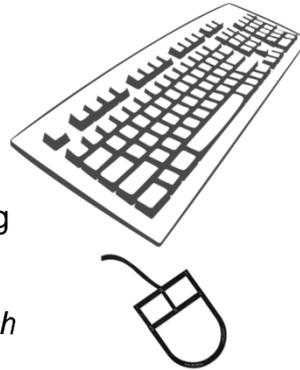
People who use and Benefit from Speech Recognition

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Motor Impairments

Often used by people who have mobility challenges with their hands

- Ranging from mild repetitive stress injuries
- Dexterity challenges
- Other disabilities such as Multiple Sclerosis
- Typical aging factors that preclude using conventional computer input



May not be effective for people with speech impairments



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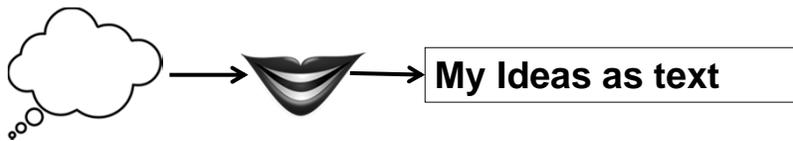
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People who use and Benefit from Speech Recognition

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Other Disabilities



- May be used in combination with other AT J-Say w/ JAWS
- Individuals with learning disabilities who have problems with thought-to-paper communication may possibly benefit
- Has promise to automatically generate captioning of conversations for people who are deaf or hard of hearing, for situations such as discussions in conference rooms, classrooms, or religious services
 - Has limitations in accuracy among diverse speakers



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People who use and Benefit from Speech Recognition



Non-disability

Legal and Medical Field

- Assist in transcription

Consumer Software

- Marketed as consumer software and its early popularity as dictation software
 - Supporting productivity
 - Hands-free control (e.g. in vehicles)



Isn't generally marketed as accessibility software for people with motor impairments



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Features of Speech Recognition Software



Command and Control

- Open applications
- Perform commands like copy, paste, and selection
- Click links, buttons, or check checkboxes, etc.
- Scroll up, down, or move the cursor around

Dictation

- Input text, numbers, formatting, etc.
- Correct dictation mistakes
- Dictate into input controls that may not support speech



Control of pointer

- Mouse grid commands to click



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Platform Support



Windows - Dragon from Nuance

Supports Apps

- Desktop, email, office apps, browsing, etc.
- IE, Firefox, and Chrome (through extensions)
 - Some ARIA support in version 13
- Most popular speech recognition
- Has text-to-speech supports
- Has multiple versions with customized dictionaries

Nuance®
Dragon®
 NaturallySpeaking
 Premium

English
 Version 13.00.000.07



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Platform Support



Windows - Dragon from Nuance (cont.)

- Supports different languages
 - English, French, German, Italian, Spanish, Dutch, Japanese
- Can be customized (scripted, macros created)
 - Insert custom text and graphics
 - Can issue keyboard commands in sequences
 - Limited accessibility API access
- Best on computer with powerful hardware and sufficient memory
- Person may not have latest version
 - E.g. due to cost or IT environment



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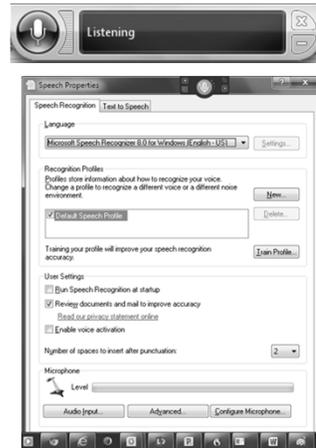


Platform Support

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Windows Speech Recognition

- Similar to Dragon but with less options. Includes:
 - Profiles
 - Review docs for accuracy
 - Activation by voice
 - Web support for browsers w/ direct voice and show numbers
 - Text selection and formatting based on on-screen toolbar buttons
 - Mouse grid



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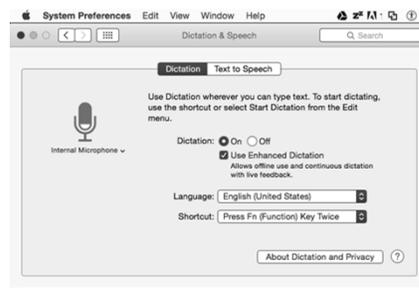


Platform Support

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Mac OS X

- Mac Speech recognition
 - Dictation automatically available with Internet connection
 - Speech control must be enabled and downloaded on Mac
- Dragon Dictate available
 - Dictation only



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Platform Support



Mobile

- Siri (iOS)
- Cortana (Windows Phone 8.1)
- Google Now (Android)

Notes

- Control is limited to system commands and dictation in input fields
- Often no mechanism to delete text or change words that were incorrectly recognized
- Not sufficient solution for people who rely on speech recognition



Siri's help menu




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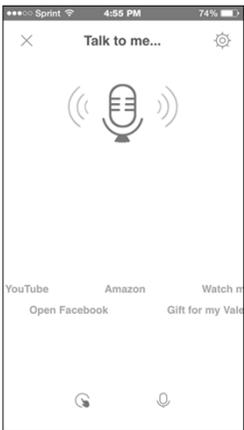


Platform Support



Mobile (cont.)

- May require internet connection
- Navigation in browser by voice is not supported unless special browser is used
 - Dolphin Sonar mobile browser – navigation and search by voice (iOS and Android)
- Dragon has dictation apps for different platforms
 - Dictation allows copy of text into common apps



Dolphin Sonar
Speech Input




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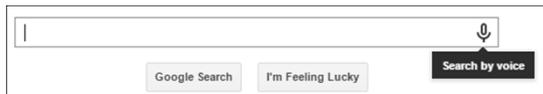


Platform Support

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Other Uses

- YouTube
 - ASR – caption videos with some degree of accuracy
 - Can correct mistakes and turn ASR into captions/transcript
- Google Voice
 - Voicemail to text
- Smart TVs
- May be built in some browsers (Web Speech API)
 - May be available to web pages
 - May be part of browser control/dictation (e.g. Voice Opera)



Voice search field in Chrome



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How to use Speech Recognition

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- Speak naturally and clear
 - Same tone, speed, and inflection that you normally speak
- Speak in phrases when possible
 - Don't add pauses between words
- Run audio setup, training, and add vocabulary
- If needed, you can force:
 - Commands
 - Dictation
 - Spelling
- May be helpful to add word signifying command
 - E.g. "click save" rather than "save"



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 **Demonstration** 

"Wake up"



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 **Demonstration** 

"Start Internet Explorer"



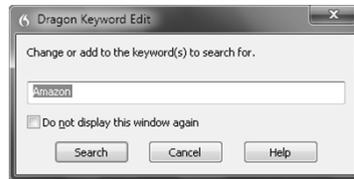
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Demonstration

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“Open top site for Amazon”



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Demonstration

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“Click Search”



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Demonstration

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“Click edit box”



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Demonstration

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“Magic bullet”



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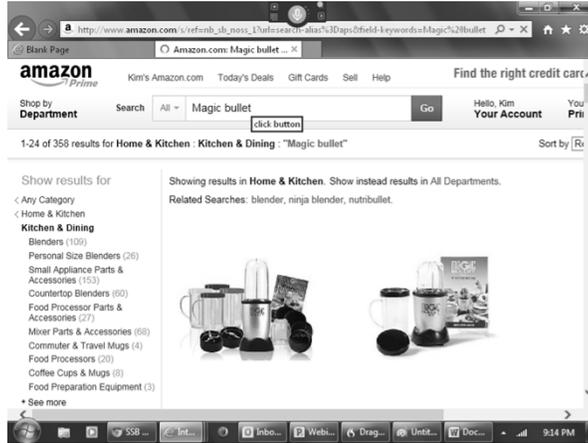
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Demonstration

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“Click button”



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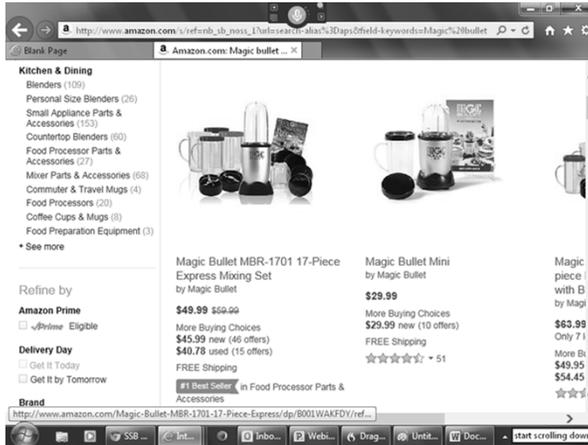
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Demonstration

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“Start scrolling down”



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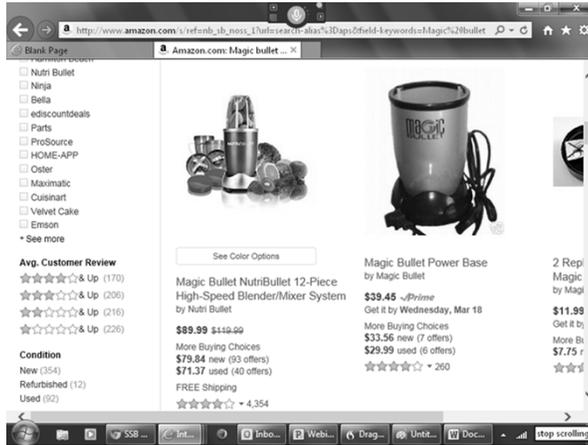
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Demonstration

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“Scroll faster”



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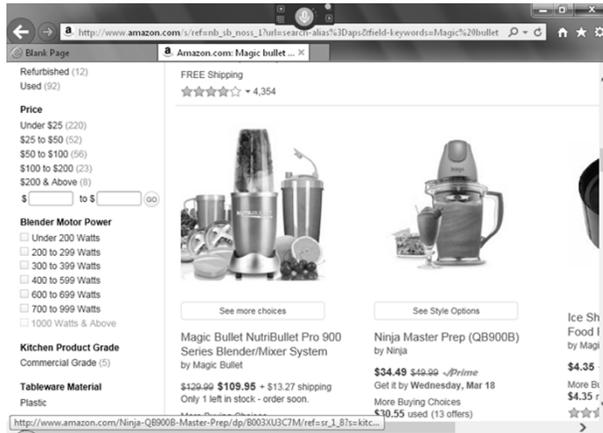
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Demonstration

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“Stop scrolling”



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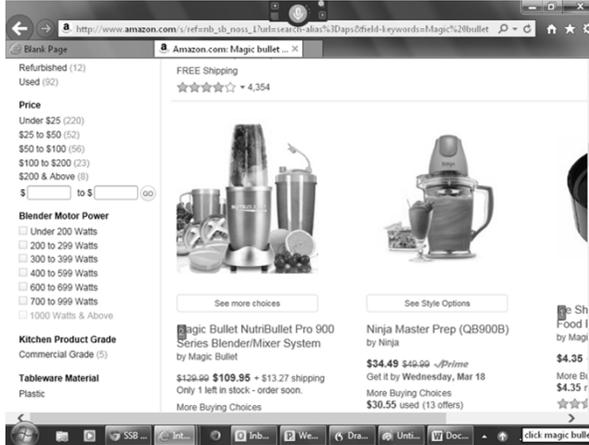
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Demonstration

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“Click magic bullet”



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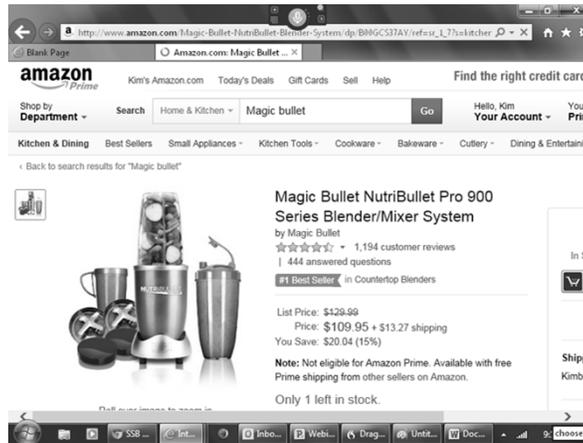
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Demonstration

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“Choose 2”



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Using Dragon on the Web

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Overview

You can use **direct voice commands** to click a particular control by its name

- “Click first name”
- “first name”
- “Click remember me”
- “remember me”
- “Click proceed”
- “Proceed”

First Name:

Remember me

Proceed



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Using Dragon on the Web

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Say the type of a control

- **click link**
- **click text field** *or* **click edit box**
- **click [radio] button**
- **click checkbox**
- **click image**
- **click list box** *then* **show choices**

Content

Country

Select your country. This setting is saved to this browser.

Tweet media Do not inform me before showing media that may be sensitive

You will see all photos or videos even if they contain sensitive media.

Mark media I tweet as containing material that may be sensitive

Please check this box if your Tweets contain sensitive media so that users can be informed prior to viewing.

Tweet translation Show Tweet translations

Checking this will allow you to translate Tweets that are not in your language.

Your Twitter archive

You can request a file containing your information, starting with your first Tweet. A link will be emailed to you when the file is ready to be downloaded.

The click checkbox command was issued and numbers appear by all checkboxes in view.



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Using Dragon on the Web

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Additional Commands

- Voice keyboard commands (examples)
 - Press tab, press down, press spacebar, press enter
 - Press alt+n, Press p
- Start scroll up or start scroll down
 - Scroll faster, stop scrolling
- Move up or move down (n)
 - Move down by 3, etc.
- For controls that don't support input
 - Show dictation box
 - Copies text into input field



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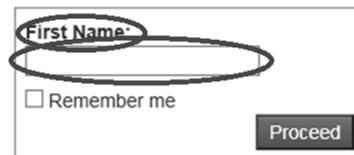


Designing Websites for use with Speech

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On-screen Labels

- Provide on-screen labels
- On-screen label must exactly match the accessible name of the control
- Accessible name can be set by
 - Aria-labelledby (except button)
 - Aria-label
 - Label element (form fields except button)
 - Title attribute (forms only)
 - Value (input type button)
 - Alt text (input type image, image links) and text content



Associate labels and form fields whenever possible via label element or aria-labelledby (Dragon 13)



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Designing Websites for use with Speech

- Accessible Name Support Matrix

Accessible Name	Supported?
aria-labelledby (except button)	Yes
aria-label	No
Title attribute (form field only)	Yes
Value (input type button)	Yes
Alt text (input type image)	Yes
Alt text in link or button	No
Link or button text	Yes
Explicit Label element (form field except button)	Yes
Implicit label (form field except button)	No



Designing websites for use with Speech

Assign Proper Roles

- If a control looks like it a button it should be a button
 - button element, input type button, ARIA role of button
- If it looks like a link it should be a link
 - a element, ARIA role of link

Upload

Sign in

These look like buttons – are they really buttons, or links?





Designing websites for use with Speech

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Keyboard Access

- Provide keyboard access
 - Benefits all users and required for keyboard-only users
 - Fallback for users of speech recognition
 - Only useful if they are documented and discoverable
- Avoid scrolling areas inside of a page
 - If you have to use them provide keyboard access to the area
- When drag and drop or rollovers are used
 - Provide alternatives, e.g. keyboard equivalents
- Dragon may change value of control directly without pressing keystrokes
 - In scripts: be aware that user may enter text without actual key being pressed.



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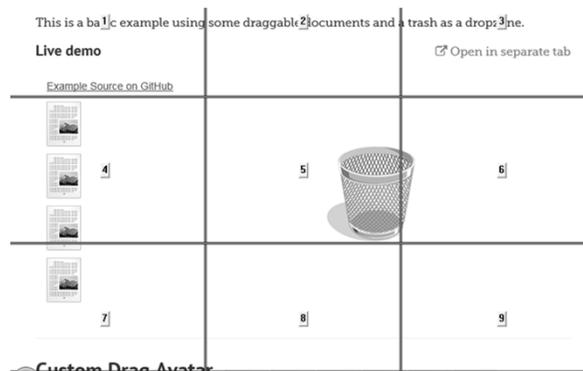


Designing Websites for Use with Speech

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Mouse grid commands

Mousegrid and Dragon's "mark" and "drag" mouse commands are not acceptable solution for not making content accessible



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Designing Websites for Use with Speech

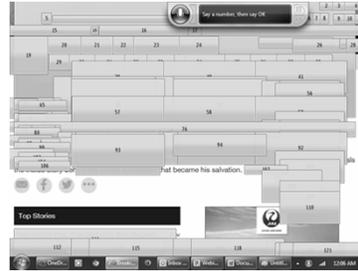
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Rich text entry and fixed position/off-screen content.

- Support standard text entry or provide equivalent support
 - E.g. Google docs
- Avoid fixed positioned links (fixed in Dragon 13)



Dragon 13 – Click Link Command



MS Speech Rec. Show Numbers command



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Speech Recognition and ARIA

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What is ARIA

- Accessible Rich Internet Applications Specification (ARIA)
 - Recommendation of the W3C
- ARIA is a set of attributes added to markup such as HTML
 - `<div id="s1" role="progressbar" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100" aria-valuetext="100 percent" />`
 - HTML5 doctype supports ARIA as valid
- Use native semantics whenever possible
 - Use progressive enhancement
- Does not change appearance of the web page
- Focuses on access by screen readers/assistive technology
 - Will change AT behavior for better or worse



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Speech Recognition and ARIA

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Support

- Dragon 13, the most recent version, now supports a number of ARIA roles, within certain limits.
- Microsoft & Mac speech recognition do NOT support ARIA
- Supported roles for voicing “click” followed by role
 - Buttons (e.g. `<div role=“button” ... > Proceed </div>`)
 - Links
 - Radio buttons
 - Checkboxes
- Listbox role not supported
 - E.g. click listbox not supported
- Other widgets support access with direct voice commands



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Speech Recognition and ARIA

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Standard HTML Element and Keyboard Patterns

- First rule of ARIA: use standard HTML element whenever possible
 - Use standard HTML elements and style as needed rather than creating custom widgets
- Implement keyboard access pattern for ARIA control
 - Arrow keys for page tabs, lists, menus, and comboboxes, etc.
 - All controls should be placed in the focus order
 - Provide visual indicator of keyboard focus
- Dragon will treat elements with `tabindex` and `onclick` as links
- MS speech recognition will not provide access to generic elements with `tabindex` or `onclick`.



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Speech Recognition and ARIA

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Aria-labelledby and aria-label

- aria-labelledby support for form fields and links
 - E.g. input, checkbox, radio button, div with tabindex or onclick
 - Does not appear to be supported for buttons
- aria-label is not supported
- Practically speaking using tabindex and aria-labelledby (where appropriate) will allow *direct voice access* to all sorts of content found in ARIA widgets such as menus, trees, sliders, page tabs, accordions, combo boxes, etc.



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Speech Recognition and ARIA

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WCAG Conformance

- ARIA can be used for WCAG conformance...
 - if accessibility supported
- e.g. If Dragon is part of the user agent supported technology stack for their WCAG conformance claims – content must be accessibility supported with Dragon



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Resources

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- SSB Blogs on Speech Recognition
 - <https://www.ssbartgroup.com/blog/2014/11/14/considerations-for-testing-with-speech-recognition-software-such-as-dragon-naturally-speaking/>
 - <https://www.ssbartgroup.com/blog/2014/08/29/dragon-13-aria-support-is-here/>
- Dragon Naturally Speaking Shortcuts
 - <http://supportcontent.nuance.com/kbfiles/16477-dns13commandcheatsheet.pdf>



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Resources (cont.)

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- Setting up Windows Speech Recognition
 - <http://windows.microsoft.com/en-us/windows/set-speech-recognition#1TC=windows-7>
- Information on Speech Recognition for the Mac
 - <https://support.apple.com/en-us/HT5449>
- The ARIA Specification
 - <http://www.w3.org/TR/wai-aria/>



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 **Thank You!**

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Thank you for participating!

NEXT SESSION IS MAY 21, 2015

**Digital And Technology Access:
The Role of Law and The Limits of Law
With Lainey Feingold**

The session today was recorded
and will be archived at
[HTTP://ADA-AUDIO.ORG/ARCHIVES/ACCESSIBLETECH/](http://ada-audio.org/archives/accessibletech/)

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