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Redstart Systems
making speech fly

Speech Input and Web Accessibility
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Kimberly Patch
President, Redstart Systems
Invited Expert, W3C UAAG
kim@redstartsystems.com
617-325-3966
www.redstartsystems.com

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I'm Kim Patch. 19 years ago I was working as a journalist and got a bad case of repetitive strain injuries. I've been using speech to control my computer since then. I was frustrated with the first speech recognition programs and made a lot of adjustments. That turned into Utter Command, an add-on for Dragon that makes Dragon more hands-free. So I use speech input myself, and I enable other speech users. I'm also an invited expert for the W3C Web Accessibility Initiative.

I'll be talking about navigating the Web efficiently using speech. And I'll talk about what developers can do to make a difference for people who navigate your site or Web application by speech.

Navigation Methods

- Say what you see (spotty, can be dangerous)
- **Numbered links** (changes screen)
- **Site List**
- **Speak keyboard**
- Search

- Last resort/workarounds
- Place mouse by speech (can get tedious)
- **Name a mouse click** (requires setup)

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Here's an overview of the general navigation methods a speech user can use.

I'll be using three tools to demo some of these methods – Dragon NaturallySpeaking Professional, a mouseless browsing extension for Firefox that numbers links, and my add-on Utter Command. There are several methods of using speech to navigate the Web and there are some pluses and minuses.

The traditional Dragon method of Web navigation is to say what you see – the names of controls or links. This method doesn't work for all controls and links. And it can be dangerous because if you're dictating text and happen to say the name of a link you'll suddenly find yourself whisked off to the link and when you come back the text you were working on may be gone.

Numbered links avoid that problem but the numbers change the screen. I'll show you this in action as well as the site list and speak keyboard methods.

One thing Dragon does well is search. I'll show you that too.

There are also some methods of last resort. Dragon's mouse tool is tedious. Utter Command has alternative methods. The best one requires some setup. My job is to convince you to develop in such a way that we don't need these workarounds.

Standards and Flexibility

- We have standard program keyboard shortcuts
- Apply standard keyboard shortcuts to Web applications
- Enable the keyboard and you've enabled a pathway for speech
- App makers: allow users to adjust, organize and share keyboard shortcuts

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Here is an overview of what Web developers can do to make web sites and applications accessible for folks who use speech input. It's fairly simple.

We have standard program keyboard shortcuts that people are already used to.

Apply these standard keyboard shortcuts to Web applications.

If you enable the keyboard, you've enabled a pathway for speech.

App makers: in addition, allow users to adjust, organize and share keyboard shortcuts. This is critical for single letter shortcuts -- more about this later.

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Key Keys

- General Navigation
 - Predictable Tab order
- Menus and Trees
 - enable Up/Down/Left/Right, Enter
- Drop-down lists
 - enable multiple letters to navigate, Escape
- Checkboxes and Radio Buttons
 - Enable Space to toggle

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Here are the key keys.

For general navigation predictable Tab order is important

For trees and menus it's important to enable Up/Down to navigate, Left/Right to collapse/expand and Enter to activate

For drop-down lists it's important to enable multiple letters to navigate and Escape to close the list

For checkboxes and radio buttons it's important to enable Space to toggle

Scrolling

- Keep scrolling to a minimum. Provide
 - Large drop-down menus
 - Navigation links

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Something else that helps speech users – and makes the Web more efficient for everyone – is keeping scrolling to a minimum.

The key for developers is to provide large drop-down menus – use the available space.

And where appropriate use navigation links to give users a better mental map and make for fewer steps for back-and-forth navigation

Demos: I'm Using

- Dragon NaturallySpeaking Pro
- Dragon add-on Utter Command
- Firefox Mouseless Browsing extension

Now I'll show you a couple of demos. Again, I'm using Dragon NaturallySpeaking Pro and two other tools, Dragon add-on Utter Command and Firefox extension Mouseless Browsing.

Demo: Filling out Forms

- Speaking keyboard

Web developer glitches that could thwart Demo

- Unexpected Tab order
- Neglecting to enable two-letter navigation on drop-down lists

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Here's how I fill out forms

Demo 2 File

Zoom In 2

2 Tab Kimberly · 1 Tab Patch

1 Tab President · 1 Tab Redstart Systems

1 Tab Address · 2 Tab Boston

1 Tab Massachusetts · 2 Tab Zip

1 Tab Phone · 2 Tab email

Zoom Out 2

Here's how I go directly to a Web element using numbered links -- watch the cursor jump to the top field, which is numbered one.

1 Go

Watch carefully – this is an example of speaking keyboard – I'm going to say 2 keys in a row

Tab Delete

I'll do the same thing again – watch the cursor

Tab Delete

Now I'll speed things up

Tab Delete Repeat 10

Window Close

I used 12 speech commands to zoom in twice, fill out 10 fields, zoom out twice, delete 10 fields and close the window (it would have taken 53 steps by keyboard and mouse not counting letters). This is where speech input can really get powerful -- but only if Tab order is predictable

Filling out Forms Commands

“Demo 2 File”
“Zoom In 2”
“2 Tab Kimberly · 1 Tab Patch”
“1 Tab President · 1 Tab Redstart Systems”
“1 Tab Address · 2 Tab Boston”
“1 Tab Massachusetts · 2 Tab Zip”
“Zoom Out 2”
“1 Go”
“Tab Delete Repeat 10”
“Window Close”

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Here are the commands I just said.

Demo: Basic Web

- Sites list
- Navigating links
- Navigating among tabs
- Search

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Now I'll show you how an experienced speech user might do basic Web navigation. Again, I'm using a mix of Dragon, the mouseless browsing extension and Utter Command.

Weather Site

New York Times Site

Knowbility Site

Bad Demo Site

W3C Site

Screen Down

I can use the numbered link commands even when the numbers are off screen

8 Go

Go Back

2 Tab Back

Here are the Dragon search commands

Search Web for green apples

Search Web for accessibility

Window Close

Basic Web Commands

“New York Times Site”
“Knowbility Site”
“Bad Demo Site”
“W3C Site”
“Screen Down”
“8 Go”
“Go Back”
“2 Tab Back”
“Search Web for green apples”
“Search Web for accessibility”
“Window Close”

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Here are the commands I just said.

The first five commands were Utter Command. The Go command was enabled by the Firefox extension. The search commands were straight Dragon.

Apps Developers

- Enable keyboard shortcuts just like you would for a desktop app
- Allow users to **adjust**, **organize** and **share** keyboard shortcuts. This is critical for single letter shortcuts.
- Provide good undo support

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I mentioned apps developers earlier. It's important that you enable keyboard shortcuts just like you do for desktop apps. It's also important to allow users to adjust, organize and share keyboard shortcuts. I'll show you why this is critical, especially for single letter shortcuts.

The other thing that's important -- especially with speech users -- is to provide good undo support. This makes it so a mistake is not the end of the world.

| | | | |
|------------------------------------|---|-------------------------------------|---|
| Reply all | a | Previous message | p |
| Compose | c | Move to chat search | q |
| Archive/Remove contacts from group | e | Reply | r |
| Forward | f | Star | s |
| Move up | j | List view | u |
| Move down | k | Move to | v |
| Label/Group menu | l | Select | x |
| Mute | m | Archive/Unstar/Untrash/Remove label | y |
| Next message | n | Undo | z |
| Open | o | | |

Speech users have a special issue with single letter shortcuts. Gmail is one example. If Dragon interprets a stray noise as a word, or if you accidentally try to dictate when the cursor is not in a text field, or if you say something when you think the microphone is off and it isn't -- you can trip a whole bunch of single letter shortcuts. Lots of things can happen at once that aren't so easy to reverse. And it's hard to follow what's changed when something like this happens.

Here are the single letter shortcuts for Gmail. Using this chart you can see what will happen if you say your name. I like to use the example "Hey Kim". Those six letters cause a lot of trouble. Four of them do things. E archives a message or removes a contact depending on where I am; Y archives, toggles the star, takes something out of trash or removes a label depending on where I am; K moves the cursor down one, and M mutes.

At the same time the shortcuts are useful.

There is an easy fix for this big problem. Let the user adjust the shortcuts. Fortunately there's a Gmail add-on that does this. I add a + to the beginning of each shortcut, and we speech-enable the new shortcuts.

Many programs that use single letter shortcuts, though, don't let the user adjust the shortcuts, including Yahoo, Hotmail, Thunderbird and most other Google apps.

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Single Letter Shortcuts: Tbird

| | |
|------------------------------------|---|
| Archive | a |
| Previous Message | b |
| Mark as Read By Date | c |
| Next Message | f |
| Mark as Junk | j |
| Newsgroups: Ignore/Unignore Thread | k |
| Toggle Read/Unread | m |
| Next Unread Message | n |
| Previous Unread Message | p |
| Mark Thread as Read | r |
| Add/Remove Star | s |
| Next Unread Thread | t |
| Newsgroups: Watch Thread | w |

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Here's what "Hey Kim" does in Thunderbird.

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Single Letter Shortcuts: Yahoo

| | |
|---------------------|---|
| Reply All | a |
| Start a new chat | c |
| Move message | d |
| Forward message | f |
| Mark As Read | k |
| Flag | l |
| Check mail | m |
| New Message | n |
| Print | p |
| Reply | r |
| Search box | s |
| Toggle Reading Pane | v |

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Here's what "Hey Kim" does in Yahoo.

Demo: Last resort

- Naming a mouse click – requires setup

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Picture a Web app that uses drop-down lists for color. You should be able to access these via keyboard shortcut and then use the up/down and enter keys to select a color, or via numbered links. If you can't, you have to use the mouse by speech. This is tedious. We do have a workaround, but this workaround requires set up, so it's only worth it to enable something you use a lot. This is the naming a mouse click workaround – to set it up I put my cursor on the places I need to click and name them beforehand. Once it's set up it's a pretty good workaround.

I'm going to show you this in WordPad. This method can be used anywhere, including in a word processing app like Google Docs. I'll change colors by speech a couple of times, then I'll add a bullet.

Wordpad Open

Size 24

I want to bullet this line and make it red

Watch the cursor – this next command is a named mouse click that clicks the Bullet icon

Bullet Touch

This Line

This next command clicks twice – I'll do a few of these

Color Red Touch

Words I want

Color Blue Touch

Words and this

Color Gray Touch

Window Close No

What Web developers can do to make speech users' lives easier

- Be predictable with Tab order
- Follow keyboard shortcuts standards
- Allow users to adjust keyboard shortcuts
- Limit scrolling

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To summarize – here are the key things that Web developers can do to make speech users' lives easier.

Be predictable with tab order – the predictability enables us to use more sophisticated commands.

Follow keyboard shortcuts standards -- the less the user has to think about what web site or program she's using the more brainpower is freed up to do actual work.

If you're an app developer, and especially if you use single key shortcuts, make sure to allow users to adjust keyboard shortcuts. And if you include a facility to organize and share keyboard shortcuts, you'll save a lot of user time. If I could share my gmail shortcuts, and you wanted to try them out, for instance, you could just load them instead of spending 20 minutes putting a plus sign in front of every single command.

Limit scrolling – this is good for everyone.

Parting Thought

Ease-of-use = increased traffic potential

Make site navigation more efficient and people will have a better experience on your site. They'll be more productive, and they'll be more likely to come back.

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Here's a parting thought.

Making your web site easier to use increases its traffic potential.

Make site navigation more efficient and people will have a better experience on your site.

They'll be more productive, and they'll be more likely to come back.