Information Architecture – Website Usability/Accessibility Analysis (Heuristic Evaluation)

INTRODUCTION

$3,738,864.96 is the exact dollar amount that Target, the retail chain, was ordered to pay in attorney's fees and costs to plaintiffs on August 3, 2009 for a web accessibility-related lawsuit that had been filed in 2006. ("National Federation of the Blind v. Target Corporation", *Wikipedia*). The court declared that the plaintiffs "broke new ground in an important area of law" and that "the extension of important areas of disability law into this emerging form of electronic commerce promises to grow in importance." *(ibid.)* The Target example alone should convince any organization that ensuring its information assets (*e.g.* desktop website, mobile website, mobile application) meet established accessibility guidelines is of crucial importance. Unless, of course, losing multimillion dollar class action lawsuits is part of that organization's business plan.

> *"One form of usability testing used extensively in the field is heuristic evaluation. Using a checklist or rubric of recognized usability principles, multiple evaluators inspect a website interface for potential problems."* (Clayton and Hettche, 2012)

So, how should an organization go about ensuring that its information assets are accessible? Conducting a thorough **heuristic evaluation** of the assets is one of the better routes to accomplishing this goal. This assignment will apply a heuristic evaluation to an organization's desktop website using established web accessibility guidelines from two authoritative sources:

- Web Content Accessibility Guidelines (WCAG) 1.0

- Web Content Accessibility Guidelines (WCAG) 2.0

Each source will be discussed separately and considered in relation to the selected website. At the end of the document, all accessibility issues raised will be aggregated into one recommendations list.

BACKGROUND ON SELECTED WEBSITE

The website of the Rattle Foundation is located at: http://www.rattle.com/. Rattle is an award-winning poetry magazine based in Los Angeles and founded in 1994. "Though primarily dedicated to its print issues, the magazine's website features a variety of supplemental material, such as audio archives, reviews of contemporary poetry, and electronic issues." ("RATTLE", *Wikipedia*) The importance of the print issues is evident immediately upon visiting the site, as the first link under **Home** – **Current Issues** – leads to an order form for the latest print issue. The website is fairly well designed from an aesthetic standpoint, using a visually pleasing grid-based CSS layout called Oulipo. And it is a functional website for the average user who

doesn't have any (or only minor) disabilities. There are some shortcomings to the website from a broader accessibility standpoint, however, which will be detailed in this report.
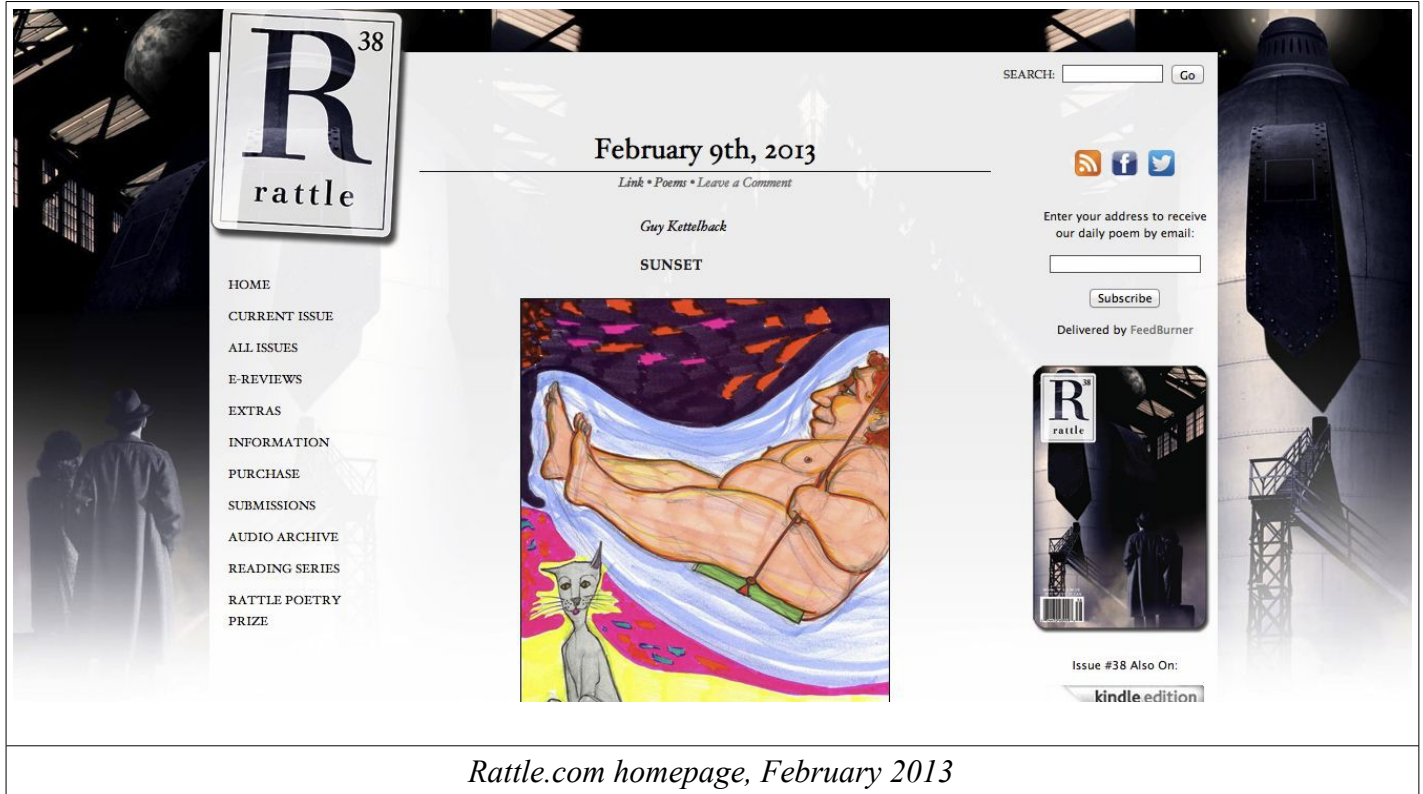
Rattle.com homepage, February 2013

WCAG 1.0

*"**Guideline 1**. Provide equivalent alternatives to auditory and visual content. **1.1** Provide a text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content)."* (w3.org)

The Rattle website fails to meet guidelines 1 and 1.1 of WCAG 1.0 in several key places. The logo in the top-left corner of the homepage lacks an alt tag, meaning that a visually impaired user using a screen reader such as JAWS would **not** be able to identify the image as being the Rattle logo.

The social media icons and e-reader links are also lacking alt tags, effectively rendering them inaccessible.

Rattle homepage images lacking alt tags, AChecker.ca

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*"**Guideline 2**. Don't rely on color alone. **2.2** Ensure that foreground and background color combinations provide sufficient contrast when viewed by someone having color deficits or when viewed on a black and white screen."* (w3.org)

AChecker.ca reveals that "the contrast between the colour of selected link text and its background is not sufficient to meet WCAG" in many locations on Rattle.com. Specifically, the links in the footer are all identified by AChecker as being inaccessible because of insufficient colour contrast. These hyperlinks are in dove gray (#666666 hex code) and they likely look acceptable to the average user with no vision disabilities, but users who have limited vision or colour deficits might strain to read the text. Gray text on a white background makes for fairly low contrast and poor readability.
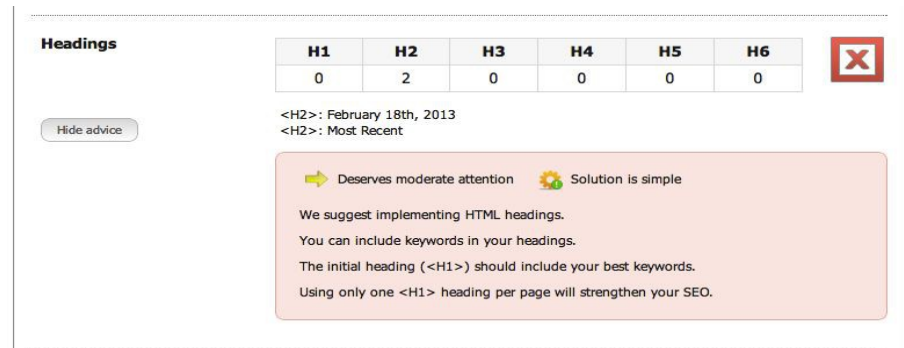

Rattle.com footer with gray text on white background

Additionally, these footer links (or any on Rattle.com, it seems) do not change colour upon being clicked. This contravenes Jakob Nielsen's usability heuristic "recognition rather than recall: minimize the user's memory load by making objects, **actions**, and options visible." (nngroup.com) Users with memory issues - especially short-term memory loss - might find navigating this website frustrating because it doesn't recognize click-through actions. After clicking **About Us**, the user might navigate away from that page and become immersed in another area of the site. Upon returning home - without an indication such as faded link colour - they might not recall that they had already visited **About Us** and click into that page again.

*"**Guideline 3**. Use markup and style sheets and do so properly. **Checkpoint 3.5**: Use header elements to convey document structure and use them according to specification."* (w3.org)

Checkpoint 3.5 is not fulfilled. Rattle.com does not implement HTML headings consistently or according to W3C specification. H2 is only supposed to be used as a subsection of H1. Instead, on the Rattle.com homepage, only H2 is used. This could potentially confuse

SEOquake analysis: Rattle.com homepage lacking H1 header

screen readers, which might interpret H2 as a subsection when in fact it's the only section. Also, it seems strange to give the date a header but leave the poem title and author headerless. A more logical use of header elements for this content would be H1 = poem title, H2 = poem author and then perhaps H3 = date.

*"**Guideline 4**. Clarify natural language usage."* (w3.org)

This requirement is fulfilled. Rattle.com specifies en-US (American English) as its natural language. This will help screen readers load the current pronunciation rules. However, it seems that English is the only offering on the site. Multilingual options are not available. This would, admittedly, be even more difficult for this site than most because translating the nuances of poetry is a harrowing task.

*"**Guideline 9**. Design for device-independence."* (w3.org)

This requirement is only partially fulfilled. An individual with a health issue such as carpal tunnel syndrome might not be able to use a mouse. In that case, navigating the website via a keyboard might be necessary. The first tab click on the homepage selects the search box. However, a Firebug inspection reveals that the search box does not have a label associated with it. A separate "Search" text label is adjacent the box, so the special needs user might still be able to discern its meaning. But it's always better to label each form field directly so that it carries meaning by itself (this will help screen readers.) The "Go" button next to the search box is also not labeled and is fairly meaningless if not considered in relation to the other elements.

Next issue: by the third keyboard tab click, the selection field disappears (in Google Chrome v24). The user doesn't know where the tab selection just went unless they look at the URL display (in Chrome, bottom left-hand corner of browser). Worse, in Safari v5.1, the tab selection just starts looping back on itself after three clicks (search box selection, subscribe box selection, URL bar selection, repeat *ad infinitum*). In Chrome, you can at least navigate through all parent navigation items (but not their children). The navigation items are also lacking alt tags/descriptive labels, so the visually impaired user navigating through this menu with a screen reader might get lost. For example, there is one parent navigation item labeled simply "Information". What kind of information? The user who hears this nav item read to them from a screen reader won't know what to expect behind such a vague label. On the other hand, the links to poems under "Most Recent" on the right side of the homepage are pretty well optimized for accessibility. They have title tags added to them so that a descriptive tooltip pops up upon mouseover, *e.g.* "Enlightenment" by Rose Kelleher. But the links could be further improved for accessibility by letting the user know that it's a poem they're about to click into. *E.g.* "Enlightenment", a poem by Rose Kelleher.

Moving onto the **Current Issue** page via the keyboard, I discover that the all-important Add to Cart button lacks a label attribute. WCAG 1.0 checkpoint 12.4 instructs to "associate labels explicitly with their controls." That guideline is contravened here.
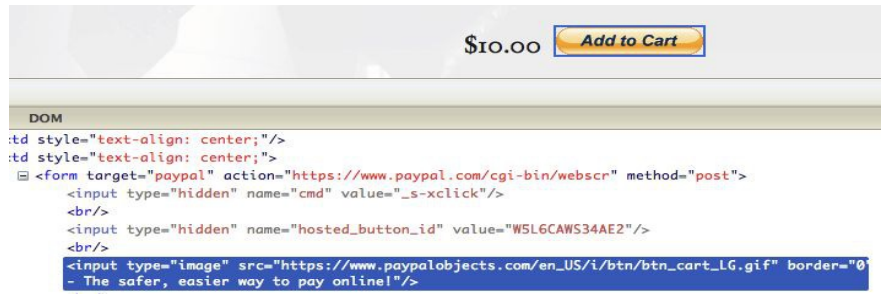
Rattle.com Add to Cart button missing label attribute

Yes, the words "Add to Cart" are clearly visible for most users. But they are built directly into the image, meaning that a visually impaired user will have no idea that this button is for the "Add to Cart" functionality because they cannot decipher text built directly into images. They need a LABEL FOR attribute in the HTML code in order for their screen reader to identify the functionality. It does have an alt tag that reads "PayPal - The safer, easier way to pay online!", but that could easily be mistaken for a PayPal advertisement rather than an Add to Cart function when using a screen reader.

Moving onto the **Your Shopping Cart** page, similar issues reveal themselves. I was able to navigate through each form field successfully until after the Calculate button, when the tab selection disappears. It should have progressed directly to Continue Shopping, which is the next button in the form. Instead, it takes **six** additional tab clicks before Continue Shopping is finally selected. In Safari, the tab selections turn into an endless loop again after only four clicks. There is no way of getting to the Checkout button via keyboard, so the keyboard-only user *would never be able to progress past this page* in Safari.

"***Guideline 11****. Use W3C technologies and guidelines.*" (w3.org)

This requirement is only partially fulfilled. Rattle.com makes extensive use of W3C technologies such as HTML and CSS. But a non-W3C format is also used extensively on Rattle.com – PDF. Namely, all of Rattle's e-issues (under **Extras** – **E-Issues**) are only available in PDF format. PDF has its advantages in that it's arguably better for printing than any other format and most regular Internet users already have a PDF reader installed. But many screen readers – especially older versions – have a hard time interpreting PDF documents. And even newer versions can only interpret PDFs that have been properly tagged. PDFs are acceptable *if* they have been designed with accessibility in mind. The problem with the Rattle.com PDFs is that they haven't been. I used a tool called the **eAccessibility PDF Check** from eGovMon to determine that the Rattle.com PDFs are largely inaccessible (eGovMon is a user-driven innovation project co-funded by the Research Council of Norway). The tool is based on PDF design techniques laid out in WCAG. I selected the

newest e-issue available on Rattle.com at the time of this writing (spring, 2012) and ran it through PDF Check. The PDF passed on four criteria and failed on five: natural language, running headers and footers, bookmarks, correct tab and reading order, and structure elements (tags). All of these accessibility issues are important, but perhaps the main problem is that the Rattle PDFs lack tags. This means that users with special needs will not be able to access important information about the structure of the document. The lack of bookmarks exacerbates the missing tags problem. Missing bookmarks contravenes WCAG 1.0 checkpoint 13.3: "provide information about the general layout of a site (*e.g.*, a site map or table of contents)." A table of contents *is* provided in the analyzed PDF, but it is of no use to users with special needs because – without bookmarks – the sections cannot be jumped to directly using a screen reader. This is particularly unfortunate since the Rattle PDFs are all quite long (30-60 pages). Without tags and bookmarks, users of assistive technology would have a very difficult time navigating these lengthy documents. The PDF Check results for the Rattle.com PDF can be viewed here: (http://bit.ly/XzCXt8).

"***Guideline 13***. *Provide clear navigation mechanisms. Provide clear and consistent navigation mechanisms -- orientation information, navigation bars, a site map, etc. -- to increase the likelihood that a person will find what they are looking for at a site.*" (w3.org)

This requirement is only partially fulfilled. The left-side navigation menu is consistent in that it carries across the entire site. From an accessibility standpoint, the parent-level nav items are selectable via keyboard, but it seems that the child-level items are not. Worse, the child-level items do not appear anywhere else on the site except through that left nav menu. In other words, there is no local navigation on Rattle.com – only global. This means that special needs users might not even be able to navigate to child-level pages (it depends on the sophistication of their screen reader). Rattle.com is also fairly poor at providing orientation information. There are no breadcrumbs and the nav menu links do not change in appearance, so users are given no indication of where they are in the site when they access deeper pages. A properly-constructed sitemap would mostly solve this problem by providing users with an overview of the entire site on one page; however, a sitemap does not seem to exist on Rattle.com.

WCAG 1.0 checkpoint 13.2: "provide metadata to add semantic information to pages and sites." This checkpoint is only partially fulfilled. Rattle.com pages are distinguished by separate titles but do not seem to contain important metadata such as the META DESCRIPTION attribute that would be very helpful to those with special needs using assistive technology. These users - especially those who are visually impaired - would greatly benefit from a pithy summation of each page that they're clicking into. Even the Rattle.com

homepage is lacking this important attribute.
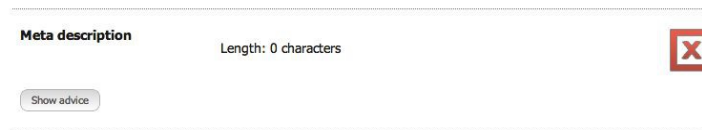
SEOquake analysis: no meta description on Rattle.com homepage

The navigation is also very unclear in parts. Certain navigation items are very poorly labeled, such as **The Impertinent Duet** under **Extras**. This might be a rather creative and literary-sounding label choice, but it fails to tell the user anything about the content behind it. It's not good to get too creative when it comes to nav menu labeling. Upon clicking into the page, I discovered that it's about the art of translating poetry – an "impertinent duet" or "difficult dance", according to the content writers. Then why not just label the nav item "Translating Poetry"? That would be a much more sensible label for communicating the page's information to not just users with special needs but all users of this website. Nielsen's heuristic "match between system and the real world" advises using "language, with words, phrases and concepts familiar to the user, rather than system-oriented terms." (nngroup.com) I would argue that "the impertinent duet" is a fairly system-oriented term in that it seems to originate from the creator of this webpage (certainly not from the users, at least). But most users should be familiar with the phrase "Translating Poetry" or at least be able to discern its meaning without having to click into it first.

WCAG 1.0 checkpoint 13.7: "if search functions are provided, enable different types of searches for different skill levels and preferences." This checkpoint is not fulfilled. The search functionality on Rattle.com is seriously lacking. There is no advanced search feature; just a plain text box. An advanced search feature would make a lot of sense on a poetry site. It seems elementary that a regular user will often want to search by author or title of poem. But that option is not provided here; the user must make do with a full-text search only. Worse, the user is given no visual indication of why a particular search result returned. *E.g.,* I performed a search on the query "water" and received multiple returns (the exact number isn't indicated) but no **boldface** on that query. So I had to then do a browser search on "water" in order to see where in each result the query was located. In addition, the Rattle.com search results page displays the *entire* contents of each returned page, creating a very lengthy search result that usually requires a lot of scrolling to review. The standard way of displaying search results is with a summary page that provides short descriptions of each result. Rattle.com should follow this method because it's better for usability (less scrolling, improved readability).

WCAG 2.0

*"**Guideline 1.4.4**. Resize text: Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality."* (w3.org)

This requirement is not fulfilled and is a fairly significant oversight for such a text-heavy website with an audience made up of many older and aging users. Many of these users likely don't have the best eyesight and would prefer to read Rattle's poems at a larger font size. The font used is a readable serif (Palatino Linotype), but sized small on most pages at only 0.9em. True, the font size can always be increased through the browser itself by doing a zoom-in/zoom-out, but that unnecessarily increases the size of the entire page and somewhat distorts the CSS styling. It's also not very intuitive for a user to have to go into their browser options to change a website's appearance. A text resizing widget for the poem content would be much more intuitive and user-friendly. Rattle.com also makes extensive use of the and <i> elements, which aren't handled as well by screen readers as the <em> and <strong> elements. *I.e.,* bold and italic merely specify how the text looks, whereas emphasize and strong specify what the text means (style vs. semantics). Example page: http://bit.ly/VNQ9ck with THE LONG VIEW JUST KEEPS TREADING WATER by James Doyle. Technique C14: "Using em units for font sizes" in WCAG 2.0 states that the <strong> tag should be used to most effectively scale content. Where headings and paragraphs use different sizes, <strong> and <em> will allow the text to scale appropriately in whatever context they are used. Before a text resizing widget can be properly implemented, then, the <b> and <i> elements should be removed.

*"**Guideline 1.4.5**. Images of Text: If the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following... Customizable: The image of text can be visually customized to the user's requirements."* (w3.org)

This requirement is not fulfilled. Example: http://bit.ly/WyLxsS. A major accessibility *faux pas* is committed here by displaying blocks of text (a full poem) in an image. The unusual visual presentation of this poem could have been constructed through HTML simply by inserting spaces. Worse, the image isn't even tagged with an "alt" or "title" attribute. This, of course, will be completely incomprehensible to a screen reader. And the image cannot be customized the user's requirements in any way. To be fair, an audio version is supplied, but perhaps a visually impaired user would prefer to use their screen reader to read the text instead. They do not have this option here.

*"**Guideline 1.4.8**. Visual Presentation: For the visual presentation of blocks of text, a mechanism is available to achieve the following: **1)** Foreground and background colors can be selected by the user. **2)** Line*

spacing (leading) is at least space-and-a-half within paragraphs, and paragraph spacing is at least 1.5 times larger than the line spacing." (w3.org)

These requirements are not fulfilled. Foreground/background colours cannot be altered. And there appears to be no line spacing between text on most pages, an option that would be useful especially for the longer poems that are displayed on the site. Some line spacing would increase readability.

*"**Guideline 2.4.5**. Multiple Ways: More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process."* (w3.org)

This requirement is not fulfilled. The left-hand side menu is the only way to navigate around Rattle.com.

*"**Guideline 2.4.7**. Focus Visible: Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible."* (w3.org)

This requirement is not fulfilled. In Chrome, the keyboard focus indicator is visible only for the first two tab selections (on the search box and "Go"). It then disappears on the left-hand side menu but can still make parent-level selections. In Safari, the keyboard focus indicator is visible only on the search and subscribe boxes. It then starts looping back on itself and cannot make any further selections.

*"**Guideline 2.4.8**. Location: Information about the user's location within a set of Web pages is available."* (w3.org)

This requirement is not fulfilled. Rattle.com pages do not have breadcrumbs and the left-hand side menu does not change in appearance to indicate user's location in website.

*"**Guideline 3.1.3**. Unusual Words: A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon."* (w3.org)

Poetry pedants would likely argue that adding this functionality would distort the purity of the poetic medium. And I certainly don't want to see a poetry site turned into Dictionary.com. However, I believe that an appropriate balance could be struck here if the functionality is used sparingly. After all, if the poetry is now online, why not utilize the power of the Internet to provide an added layer of meaning to the poem? Merely replicating the static quality of a poem on paper seems like a missed opportunity in the online environment. So why not provide pithy definitions of arcane and specialized words/phrases upon mouseover? When the user hovers over that word, a subtle pop-up box could display the definition. Or, the definition(s) could simply be provided at the bottom of the page, after the poem. As WCAG 2.0 states, "this success criterion may help people with cognitive, language and learning disabilities who have difficulty decoding words." It

will also benefit users without disabilities. For example, when reading this poem - http://bit.ly/VNQ9cg - I encountered the word "Weltschmerz". Having no idea what it meant, I had to interrupt my reading of the poem with a visit to Google and then to the Wiki page on the word. I then went back to the poem. In this circumstance, usability would clearly be improved by somehow adding the definition of that undeniably arcane word and allowing the user to remain on Rattle.com.

*"**Guideline 3.1.6**. Pronunciation: A mechanism is available for identifying specific pronunciation of words where meaning of the words, in context, is ambiguous without knowing the pronunciation."* (w3.org)

This requirement is only partially fulfilled. Only selected poem pages on Rattle.com have a built-in audio player that provides a reading of the poem. This audio player would, presumably, provide the correct pronunciation of each word. This is an especially helpful feature in the case of this site because pronunciation often carries added meaning in poetry. Every poem page should carry this audio feature to enhance accessibility. However, improvements could be made to the audio delivery method. The audio player used on Rattle.com is in Shockwave Flash (SWF) format. This means that the Shockwave plug-in needs to be installed in order for the audio to play. A Millward Brown study conducted in 2011 revealed that Shockwave content reaches 41% of Internet-enabled PCs. (http://adobe.ly/XjJsB0) This *is* a substantial number, but it nevertheless reveals that plenty of Internet users don't have Shockwave. Perhaps a more accessible, widely used format for audio playback could have been selected. Additionally, the embedded audio player does not seem to be selectable/controllable by keyboard in either Chrome or Safari. Finally, the SWF code does not contain any kind of descriptive alt tag explaining the meaning of the player. This means that screen readers might not be able to identify the purpose of this code. *E.g.,* adding alt="Audio version of [poem's name] by [poem's author]" would have been helpful.

#	Recommendations for improving the accessibility of Rattle.com	Related heuristic	Severity (critical, high, medium, low)
1	Be more consistent about implementing alt tags in images, *e.g.*, logo on homepage missing alt tag.	WCAG 1.0, guideline 1	Critical
2	Implement higher contrast between hyperlink colours and their backgrounds, especially with regard to the footer links.	WCAG 1.0, guideline 2	Low
3	Have hyperlinks visually recognize click-through actions (usually accomplished by using a more faded colour for the clicked links.)	Nielsen's "recognition rather than recall"	Medium

4	Implement header elements more consistently, logically and according to W3C specification.	WCAG 1.0, guideline 3	High
5	Design for device independence. The keyboard focus indicator should not disappear when tabbing and all hyperlinks on the page should be selectable via keyboard. *E.g.*, child-level global nav links are currently unreachable via keyboard on Rattle.com.	WCAG 1.0, guideline 9 and WCAG 2.0, guideline 2.4.7	Critical
6	Associate labels explicitly with their controls. *E.g.*, Add to Cart button is missing LABEL FOR attribute.	WCAG 1.0, checkpoint 12.4	Critical
7	Optimize PDF documents for accessibility (*e.g.*, implement bookmarks, tags, headers) or use a W3C technology (*e.g.*, HTML/CSS) instead of PDF.	WCAG 1.0, guideline 11	Critical
8	Provide clearer navigation and orientation information (*e.g.*, breadcrumbs, sitemap, global nav that changes in appearance according to user's location in site).	WCAG 1.0, guideline 13 and WCAG 2.0, guideline 2.4.5/8	High
9	Be more consistent about adding metadata to pages, especially the meta description. A page summary could be useful screen reader users.	WCAG 1.0, checkpoint 13.2	Low
10	Use clearer and more self-explanatory nav menu labeling, *e.g.*, "Translating Poetry" instead of "The Impertinent Duet".	Nielsen's "match between system and the real world"	Low
11	Enable different types of searches for different skill levels and preferences, *e.g.*, implement advanced search option. Improve usability of search results page by applying boldface to matched queries and creating a summary page with short descriptions.	WCAG 1.0, checkpoint 13.7	High
12	Implement a text resizing widget for poem content and semantic elements that are handled better by screen readers, *e.g.*, <em> and <strong>.	WCAG 2.0, guideline 1.4.4 and technique C14	Medium
13	Stop creating images of text and use HTML instead.	WCAG 2.0, guideline 1.4.5	Medium
14	Increase line spacing to at least space-and-a-half to improve readability.	WCAG 2.0, guideline 1.4.8	Low
15	Provide a mechanism for quickly identifying definitions of unusual words or phrases.	WCAG 2.0, guideline 3.1.3	Low

16	Be more consistent about implementing the audio feature across all Rattle.com poem pages (especially where meaning of poem might be ambiguous without proper pronunciation.) Also consider a more accessible format than Shockwave Flash (SWF).	WCAG 2.0, guideline 3.1.6	Medium

CONCLUSION

While it's unlikely that the Rattle Foundation will be hit with a multimillion dollar lawsuit as Target was, it's entirely likely that the users of its website have accessibility needs. People of all ages can and should appreciate poetry. This no doubt means that Rattle.com has young visitors in their teens and twenties and much older visitors in their sixties and seventies. And in order to help this oft-neglected art form be more widely appreciated in the 21st century and beyond, the technologies that display poetry must become as accessible as possible. The WCAG 1.0- and 2.0-inspired recommendations outlined in this report provide a solid foundation for making Rattle.com a truly accessible website that accommodates all its users.

"No wonder you feel the Weltschmerz
has let you down, no wonder you can't unhook
your knickers. You wander around, looking

for something computers can't do. O, bring
back Gene Kelly, tap-dancing and the simple

life! So what if you can't carry a tune
or a wheelbarrow? You've got to stop

watching yourself on TV. Brush the ants
off your pants and step lively now.

The Twenty-Second Century is roaring round
the bend. And you're stuck on the tracks."

- **James Doyle**, extract from "The Flippant Zeitgeist"