

Interface Evaluation & Design of the Wayback Machine

By Reed Meher | 02/22/2024

Summary of the Wayback Machine

According to the Wayback Machine's 'About' page (<https://archive.org/about/>), the Wayback Machine is the way in which a user can access the 'Internet Archive'. The Internet Archive is the title of the Wayback Machine website, though the About page tells us that the Wayback Machine is something that belongs to the Internet Archive. Interestingly, other than a recurring image of a logo that reads 'The Wayback Machine', the title of the site, its navigation header, and mostly how the page refers to itself is as 'Internet Archive'. The Internet Archive, according to the about section, is a 501(c)(3) non-profit. They boldly state that their mission is to provide "Universal Access to All Knowledge" by amassing digital records of all websites on the internet and 'other cultural artifacts' in digital form.

Likes and Dislikes

I am a big fan of the idea behind the Internet Archive (or the Wayback Machine, whatever it's called). I like the sort of retro feel of basic HTML structure and the funkiness of how the content of the site is presented: the lack of attention to aesthetic is an aesthetic unto itself, and it reminds me of my days in middle school researching through Google results (back before Google seemed to be anything but a silly word with a search input).

What I did not like is the lack of clarity on what the name of the site really is: It all seems to be the Internet Archive, but it refers to itself, seemingly randomly at certain times, as the Wayback Machine. The About section only makes this relationship more confusing by its lack of elaboration on the relationship. All it says of the Wayback Machine is that it is how the Internet Archive is made accessible. Also, they seem to archive any kind of media that can be digitized, yet it is called the "Internet" Archive. Maybe they mean it is the Internet Archive because it's on the internet? Unclear, and made more confusing still, as in the About section, there is a photo of a physical library that is quite impressive, and very much not a digital location. There is no caption for the image, however, nor is an alt tag to describe what the image is. Maybe it is the Internet Archive? I did not like this ambiguity, a theme that carries across the site, and I will detail in my evaluation and accessibility review.

Interface Evaluation

Affordance

I rate the overall **affordance** of the Wayback Machine as lacking. Some features of the website have acceptable affordance, like the search input on the homepage; it behaves just as I expect to, as it's descriptive text matches what the outcome is: it says to enter key words to search for a site and says it will search over 294 billion web pages saved over time, and that is what it seems to do upon pressing enter on the keyboard. Although, it has no visual submit or enter button: the site presumes that you

know enough about input boxes that hitting enter should run a search on whatever you typed into the box. That is all the positive things I have to say about the search function. I will try to keep my disgust for the search function contained and concise, but I could write several dozen pages about the problems it creates for a user. First, and worst, I wanted to try out a sort of benign search. I typed in 'cats'. Immediately, I was given a dropdown of 5-6 websites that had the word cat in them. I presume these were top searched sites, or maybe alphabetically brought up, but it wasn't clear why they were the top sites to show up as I couldn't find any perceptible reason for them to show up or how they were classified. I clicked on the top choice 'amatuercat', thinking it might be a popular site on the Wayback Machine (I am sure it is now). What loaded was a strange graph of years and bars that seemed to be showing how many times the site had been saved each year and how many years it had been being backed up. Below that was series of calendars with all sorts of dates highlighted, presumably when it was backed up. I had expected to be taken directly to the site when I search for, or at least taken to some sort of description of the site, but I was met with these calendars and graphs. Unsure what I should click, I clicked one of the graph bars, which loaded different calendars below. Then I clicked one of the highlighted calendar dates, and I was taken to a pornography site with no warning. That is an awful level of affordance; they describe the site as a place for amassing all knowledge and show a picture of a stately library, yet the first thing I get by searching the topic cats is pornography with zero warning. That is highly unexpected behaviors and the possible actions I could take were completely baffling to figure out.

If the makers of this site are serious about being on the level with any respectable library and truly being a place for people of all ages to come and learn and research, then they need to monitor what is being uploaded and by who. Content needs to be flagged, and the search needs to return transparent summaries of what the searched website contains before clicking on them. To me, this level of negligence leads me to suspect that the functionality I experienced is intentional and there is dubious intent behind the façade of 'research and learning' that this site alleges it provides.

Gulf of Evaluation

The gulf of evaluation in the Wayback Machine is very low for almost every primary action on the website. The first issue I observed was with the looping banner of webpage thumbnails on the homepage. I expected that if I clicked on one of these pages, that I would be taken to the webpage I clicked. It did ultimately take me to the clicked webpage, but the first time I clicked on an image, nothing happened: no loading wheel, no change to the page – in fact, the banner just kept right on looping. Thinking the link was broken, I clicked another image with the same results. Not until I clicked 4 or 5 images did the page suddenly load to one of the ones I clicked. It was loading with no cue on the page, and it changed suddenly without warning. It didn't open a new browser window, so navigating back to the Wayback Machine had to be done manually with the browser. To improve this, they need to add loading logic and some sort of cue that you are being redirected to a third-party website soon, or open the site in a new browser tab.

The second big issue I experienced where the gulf of evaluation is too great was in the sign-up form. I wanted to see what their lending service was like, so I attempted to create an account. I entered all the information they requested and hit the submit button. Nothing happened. I clicked it several more times. Nothing happened: no warnings, no directions, and my information was still there. I tried to mess

around with reentering things, changing the username, everything I could think of to inspire the form to submit but nothing worked. I then noticed a small link at the bottom to their user agreement and I clicked that, which opened a new tab with their legalese for users. When I went back to the form it now let me submit and finally gave me a warning that my username was taken and prompted me to put in a new one. This is far too wide of a gulf of evaluation. The form did not prompt me to read the legal information or ask if I'd read it. It didn't give me any error to let me know that was the primary issue that was preventing it from even checking the rest of the information I entered on the form. This could be easily fixed with better utility algorithms to prompt the user through what they need to do on the form and when the errors pop up.

Semantic Distance

As cued in my review of the Wayback Machines affordance, there is often too great of a **semantic distance** for tasks on the Wayback Machine. To find a website about cats there were way too many steps, and because of the horrible affordance, I never even was able to accomplish my goal because I was too afraid of what unknown results I might be given. After I typed cats, results were shown; after I selected a result, a new page was shown. The page did not guide me through how to interface with the many kinds of data it was showing me; clicking on the graph only showed more variations of the same confusing data. It took me ten steps before I got to the website because I had to click so many things to get to something that I could click on to get me to the site, though the site never made it clear that I would be taken to the site. This semantic distance issue could be resolved with better affordance and a better gulf of evaluation for the user; so that each step is clear, thus reducing all the extraneous steps I tried to take by clicking on anything I could find and scrolling through the page only to find no direction.

Accessibility Results

To aid me in finding all the instances of the accessibility issues I have identified, I utilized a Google Chrome Extension titled *Accessibility Insights for Web* (<https://chromewebstore.google.com/detail/accessibility-insights-fo/pbjikligggfmakdaogkfomddhfmjni>). I chose this extension because of its high reviews, its status as a Featured Chrome Extension App, and because it has 100,000 users.

Overall, the Wayback Machine had 90 failed instances of accessibility in a quick site check; there are many things that can only be checked manually, and a deeper assessment of the site would be needed to get the complete Accessibility grade. What follows is a summary of a fast check of the website.

Perceivable

Text Alternatives

I noted on the About page that there was no alternative text for the library photo featured on the page. When I checked to see if this was a recurring problem, I found that there are 36 instances when the site fails to provide an image-alt. For this reason, I give the Wayback Machine a failing grade for text-alternatives. To correct the issue, they should add alt texts to every image on the site.

Time-based Media

I attempted to load a few of the archived videos. The first link I clicked, for a BBC show, contained a broken link. The video would not load, but there was only a spinning circle to confirm the site was attempting to read the video. In the comments below, users had reported that the file had a broken torrent. I navigated back and selected the first video in their catalogue of “all videos”. It had a nondescript title, but 3 million views were reported. The video started right away, but it did not have closed captions or the option for closed captions. It was in Japanese, and obviously an amazing show (<https://archive.org/details/kv1dr4>), but there were not options for translation or closed caption. It is my hypothesis that, given the vast quantity of videos and video types present in their collection, sometimes there will be video content with closed captions, other times not. There is not a way to search for closed caption videos that I could locate. Thus, I give the Wayback Machine a failing grade for accessible time-based media. They could correct this issue by at least adding a way to filter search results by content with closed captions.

Adaptable

Adaptability is lacking. The site does not follow structural conventions for HTML tags: header tags are used out of place and out of order. The h1 tag contains text for “Top Collections”, and it is halfway down the page, as well as beneath a h2 tag for “New to the Archive?”. The main text for the page, the text about what the page is and that is at the top of the page, is hidden within a home-page-hero-block tag (maybe WordPress plugin?), and the text within it is not able to be read from the source HTML page; the plugin seems to be loading it in from another source.

Distinguishable

My use of the *Accessibility Insights for Web* found that the Wayback Machine (TWM) only failed one instance of color-contrast. The donate button doesn’t meet the WCAG 2 AA minimum contrast ration thresholds. I’m sorry that means donations may be harder to come by, but given there is only one instance, I give TWM a passing grade for distinguishable colors and contrasts.

Operable

Keyboard Accessible

I was able to get through all the content on the homepage with just my keyboard, though there was not a way to go back and forth dynamically through the content: pressing tab would scroll through all links, but the arrow keys didn’t let me go back and forth if I passed something, so if I missed what I was looking for, I would have to tab through everything on the page to get back to the link I wanted. Upon researching the topic, I learned this is common for keyboard navigation. Just to compare the experience with the keyboard access on the Google search homepage, Google far outperformed the Wayback Machine. As soon as the website noticed I was using the keyboard to navigate the site, it popped me toward some options for accessibility and how to use keyboard techniques on Google sites. This was not the case with TWM. That site, upon my using tab to search, also showed up a pop option that I could click. It said it could take me to the main page content, but that meant just sending me to the physical middle of the page, and not to any of the main features of the searches and links on the homepage. Text navigation could be improved to get users to the most important links and inputs on the page.

Enough Time

There were no issues with timing that I could identify on TWM, so was not able to text this variable.

Seizures and Physical Reactions

I did not observe any content that involved flashing lights or any visual intensity when it came to colors and animations. The site is very rudimentary and does not have that level of dynamic content to begin with. However, for physical reactions, I would argue that the site pushes you to pornographic content without warning by doing basic topic searches (like searching for cats). I had a physical reaction of shock and horror doing a basic search, so I give TWM a failing grade for causing adverse physical reactions and having content available that should have warnings it they are going to include it in their pursuit of all 'human knowledge'.

Navigable

The site is largely navigable in that it is generally easy to understand where you are, even if you aren't always sure what to do there. I take away points for the Blog link because, unlike every other link on that navigation bar, the blog link takes you to an outside website. It doesn't make that transition clear, and the look of the new website closely matches that of the Wayback Machine. When you try to navigate back, you can't, because the new homepage is that of the blog website, which replaced the URL of TWM. This could easily be approved by having the blog open in a new browser window, at the very least. It would be good to set it apart in some way, too, visually, so that users knew they would be leaving the site they are on.

Input Modalities

I noted earlier the lack of a submit button for the main search input on the homepage: I checked this on an iPhone to see how the site handled the lack of button on a touch screen. A button that wasn't there on my desktop computer did show up for the search input on mobile... at least initially. Fascinatingly, when I clicked the enter button it took me to the search results as expected, however now there was no button for the search input anymore. I tried to type in a new topic, and I could not get it to enter the new topic for a new search. I tried to navigate back to the homepage by clicking the "Internet Archive" in the header, but I was taken to homepage with a completely different homepage than the one I started on. This home page looked more like on my desktop and the search bar had no button to press to complete the search, so I was not able to conduct a new search. Mind-bogglingly, I scrolled further down the page and found an entirely different search input, and the logo for The Wayback Machine was nowhere to be found. This search bar was under an Internet Archive logo and very helpful information about what I could search, a modern 'Go' button, and options to pick what kind of search I'd like to complete.

Perhaps there is some sort of war between the Internet Archive and The Wayback Machine. I wonder who will win? TWM gets a failing grade for Input Modalities, and the Internet Archive passes but loses a lot of points for giving TWM top search billing on the homepage. They both fail for being completely confusing and contradictory. It is difficult to know how to recommend improvements: at this point, I would say just rebuild the site from the ground up, because clearly the underlying code has collapsed.

Understandable

Readable

As far as I can tell, TWM follows conventions for programmatically determined. The start of the HTML document identifies the language as “lang=en” (English). This is in line with Level A requirements from WCAG22 (<https://www.w3.org/WAI/WCAG22/quickref/?versions=2.1&showtechniques=311#readable>).

Predictable

I did not discover any instances of problems with the On Focus (3.2.1) context being unpredictable. However, 3.2.3 Consistent Navigation, Level AA, had some major issues. As I outlined above, navigating back to the homepage on mobile took me back to an entirely differently formatted homepage with very different functionality. To correct this, the creators should ensure that there are no variations on the homepage or the links to it, page for page.

Input Assistance

WTM gets a failing grade for Input Assistance due to the performance of the sign-up form. As I outlined earlier, error identification was grossly lacking and inconsistent. I was not able to understand why I couldn't sign up because of any information the site gave me, but only by my own tenacity to click and modify every detail I could think of to get the site to respond differently to my input. The average user would likely give up long before they could figure out the issue. The site also lacked many labels and almost all instructions on how to use the site or what to expect from the behavior of the site. Input assistance is almost rock bottom for this application. A complete overhaul of their inputs, forms, and user interface needs to be completed to improve these issues. Each error should give an immediate prompt that the user needs to correct something, or complete something, to continue.

Robust

Compatible

I did not find many instances of TWM lacking in robustness, though unfortunately they are rather prominent issues. I found 4 issues with ARIA attributes being used incorrectly or not meeting guidelines. The biggies are that on the homepage, the root search options include an ARIA attribute that is not allowed: “aria-expanded='true'”. This seems to be an issue of the content not being updated to meet current ARIA guidelines. And again, on the homepage, in the root of the app and its navigation menus, TWM breaks ARIA requirements by having aria-hidden elements still be focusable; these elements hidden from ARIA should be removed from the Document Object Modal (DOM) or be indexed correctly (“tabindex='-1'”). These are all simple fixes that would just include a few corrections to the HTML.

Sketch of the Wayback Machine

See included PNG Image.