Usability and Accessibility at the Harvard Art Museums

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Overview

If you stop and take a minute and think of all the objects you interact with on a daily basis, you'll find that all of these devices are man-made. Aside from making decisions about the aesthetics of a product, in the design process, ergonomics are considered so that the product is comfortable and efficient to use according to standards of the human form.

But who falls within these "standards"?

And how much priority is put into including people of different types?

Usability and accessibility considers these questions, and how accommodations can be made for people of all types. But it does not apply to only objects and products - usability and accessibility is considered in public space as well. From the curb cuts in the sidewalk that you may not give much attention that actually help people in wheelchairs, people with strollers, and the blind, to the those annoying doors that you can't tell whether or not to push or pull them - usability and accessibility is considered (or forgotten about) in public spaces to guide the behavior of people.

How does this affect the mission of the Harvard Art Museums?

Arranging space and choosing what objects to put in it affects how a user will interact with that space and what they will be able to get out of it. At the Harvard Art Museums, the "users" are the visitors (of all types) and the mission directed to them is "**advancing and supporting learning at Harvard University, in the local community, and around the world.**"

Starting from scratch, to answer this question, I had to first be introduced to how the Harvard Art Museums works and also discover who the visitors really are.

During the summer of 2017, I have conducted research and testing into how usability and accessibility needs can be discovered and then considered as part of the current museum workflow at the Harvard Art Museums. Being such a short amount of time, this project only scratches the surface on all that can be done within the museum, but the findings still have an exciting story to tell.

What is Usability and Accessibility?

Definitions:

usability

ISO* defines usability as

the "extent to which a product can be used by specified users to achieve specified goals effectively, efficiently and with satisfaction in a specified context of use" (in ISO 9241-11)
*ISO is the International Organization for Standardization.

Basically, it's all about how **intuitive** a product is to use.
Or according to Steve Krug, his first law of usability is "**don't make me think!**"

Take for example, a teapot. The handle on a teapot (figure A) implies that you should put your hand there in order to pick it up. You don't even think twice about how to pick up the teapot because you unknowingly link the size and shape of the handle and space between it and the pot, to being something that will work with your hand. In Donald Norman's Unusable Teapot (figure B), the spout is confusingly above the handle, making the pot uncomfortable to grab (and also confuses the user as to how their drink will pour out, as usually you would pour a drink in the direction away from yourself).

figure A

figure B

The implied use of the regular teapot is so obvious that it doesn't require thought. In the context of museums, this could mean something seemingly as simple as the placement of an object's label, relative to the object's location, that would tell the visitor that the label belongs to the object. If the label was across the room, the visitor would have to think and search to find more info, whereas if the label was in a much closer proximity to the object (among other factors), they would be led to the description without much thought. Increasing usability increases the chances of the visitor getting the most out of their experience.

accessibility

The most concise definition of accessibility I have found comes from the merriam-webster dictionary:

Accessibility: **capable of being understood or appreciated**

Generally, accessibility refers to making accommodations for people with disabilities. Those accommodations are what allows products and experiences to be understood or appreciated.

W3C* defines accessibility by saying:
"Accessibility addresses discriminatory aspects related to equivalent user experience for people with disabilities, including people with age-related impairments. For the web, accessibility means that people with disabilities can perceive, understand, navigate, and interact with websites and tools, and that they can contribute equally without barriers."
*W3C is The World Wide Web Consortium, an authority on web standards.

To **practice accessibility** would mean to consider ways to improve function in an experience so that it can have a wider user base that includes people with special circumstances.

These circumstances are beyond the most thought of disabilities of: blindness, deafness or mobility issues. Here are some of the circumstances someone may be in that the United States Department of Labor considers a condition that may need accommodation*:

Allergies
Alzheimer's Disease
Amputation
Anxiety Disorders
Arthritis
Attention Deficit Disorder
Auditory Processing Disorder
Autism Spectrum Disorders
Back Impairments
Bipolar Disorder
Bladder Impairments (Interstitial Cystitis)
Burn Injuries
Cerebral Palsy
Chemical Sensitivity
Chronic Fatigue Syndrome
Chronic Pain
Cognitive impairment
Color Vision Deficiency (Color Blind)
Cumulative Trauma Disorders
Deafness
Depression
Developmental Disabilities
Diabetes
Drug Addiction
Eating Disorders
Electromagnetic Sensitivity
Epilepsy
Fibromyalgia
Fragrance Sensitivity
Heart Conditions
Hearing Loss
Intellectual or Cognitive Impairment
Latex Allergies
Learning Disabilities
Migraine Headaches
Multiple Sclerosis
Muscular Dystrophy
Obesity
One Hand Use
Paraplegia
Parkinson's Disease
Personality Disorders
Phobias
Photosensitivity
Post-Traumatic Stress Disorder
Pregnancy
Respiratory Disorders
Seasonal Affective Disorder
Sickle Cell Anemia
Skin Disorders
Sleep Disorders
Speech-Language Impairments
Spinal Cord Injury
Stroke
Stuttering
Tourette Syndrome
Vertigo
Vision Impairments
Wheelchair Use

*These are impairments that may be beyond what is actually covered under the Americans with Disabilities Act (ADA), for informational purposes

The User

Every product, service, and experience is created for somebody to use. Understanding who the user is and characteristics about them, is vital to understanding how your product can be successful. There are several frameworks that can be followed to help guide you through getting to know the user. Research and multiple levels of testing are important. A thorough guideline that I recommend following comes from the International Standards Organization.

The International Usability Standard, ISO 13407, defines user centered design with the following guidelines:

The design is based upon an explicit **understanding** of users, tasks and environments.

Users are **involved** throughout design and development.

The design is **driven and refined** by user-centered evaluation.

The process is **iterative**.

The design addresses the **whole** user experience.

The design team includes **multidisciplinary** skills and perspectives.

The User at the Harvard Art Museums

When I embarked on my user research journey, I was seeking basic characteristics of the museum visitors which I then turned into a list of user attributes.

In my process, I did not get the opportunity to actually chat with the visitors so I had to collect information about them indirectly. Starting from the very beginning, I looked up statistical information for the area.

Due to the nature of Harvard Square, there is a large temporary student population (during an “academic year”) and a temporary tourist population (during the summer months).

Local statistics may not have the a lot of information on these population since they may not claim residency in Cambridge.

After finding out these populations may not be included, I moved on to research for visitors of specifically just the museum through the following methods:

Observations - this consisted of me walking around all the gallery spaces in the museums and inconspicuously taking mental or written notes about the types of people I see in the space, their behavior, whether or not they were using their own technology devices, and how they interacted with devices from the museums (like digital signage and drawers that should be pulled out)

Interviews with visitor services - It may be fair to say that Visitor Services has the most interaction with the actual visitors themselves, compared to any other department. They are a very important group at the museum who are key to understanding the user. Graciously, a couple Visitor Services staff agreed to sit down with me and answer some questions about the visitors. They were also free to tell me of any other stories, comments, or suggestions in regards to the visitor experience.

Sales data - I was able to obtain sales data for museum tickets from Visitor Services. While this data was able to put visitors into clear categories, it was important to think of the complexity of a visitor's situation when reading the data. For example, someone who purchases a ticket with the label of "Cambridge Resident", may also be someone who is elderly or a local student. I kept that in mind, and still found the data to be useful especially for quantitative information.

User Personas

From this initial research, I pulled attributes from the users. Then I mixed and matched them (via post-it notes for mapping) to create new example users.

When creating a product, it is important to have a user persona to work with. **It makes the product more focused and realistic** - you are designing for a real person and not the hypothetical idealistic user that you may have in your mind.

In the best case scenario, your attributes are pulled from more extensive research done over a longer period of time than during my small bout of research that was greatly limited by time. The process I went through is a great starting point that anyone in the museum can do and try to continue it over the course of at least a couple months to form stronger user personas.

User Attributes

specific to the Harvard Art Museums

Tourist
Local
Single
International
Brought children
English is not their 1st language
Came with a group
First time at HAM
Returning visitor
Qualify for a discounted ticket

Not an “art person”
Doesn’t visit museums often
Would be interested in events
Doesn’t know expected behavior for museums

Well informed about the museum

Needs wifi for internet (no data)
Prefers not to use technology
Uses their phone to take pictures
Owns a smartphone
Doesn’t own a smart phone

Overwhelmed by noise
Uses a cane or walker
People who touch art
Hard of hearing
Short attention span
Has a mobility disability
Uses a folding chair

Low vision
Triggered by sensory overload
Has a Developmental disability
Height of 5ft or less (short)
Don’t like stairs
Think the artwork labels are “too small”

Bold
Reserved

At admissions for 1 minute
At admissions for 30 seconds
Paid for ticket with cash

Artist Highlight:

Carmen Papalia

Carmen Papalia is an artist and social activist who makes performance art pieces that bring attention to the societal stigma associated with being disabled and using assistive devices. He is visually impaired, which motivates him to consider the different ways to interact with and interpret physical space. In the photos above, he exaggerates the attention that he feels assistive devices bring about.

I would highly suggest looking into his portfolio of works to learn about his perspective and consider space differently.

In his artist statement, he mentions that his works help promote a "productive understanding of accessibility" and overall pushes the most important part of designing for others - **empathy**.

Public Spaces

Is it important for spaces to be adapted to the various types of people who will pass through them.

Usability is considered in public spaces when design decisions guide or make an impact on human behavior. Examples include signage design for wayfinding and the distance between benches in parks to accommodate the expected visitor count and their need to take periodic rest breaks.

Accessibility is also very important, though not always prioritized. A great example of accessibility incorporated into public space would be curb cuts. Curb cuts are an overlooked assistive device that allows people with wheelchairs, walkers, strollers, etc. to easily navigate a sidewalk. The alternative of a sharp turn would require tricky maneuvering from these users. The common addition of bright colored traction pads on the curb cut assist those with low vision.

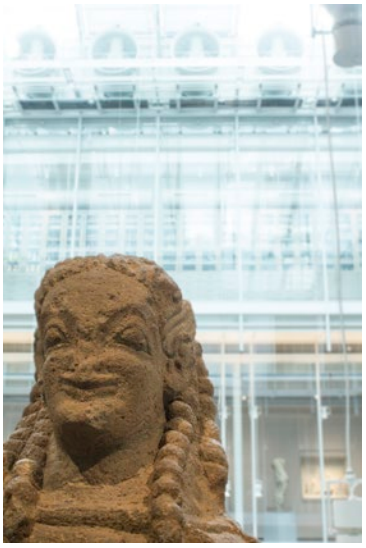
Just as objects around you are designed with human factors in mind, so are public spaces.

In a Museum Context

When adapting a space for accessibility, there are two main reasons to do so.

One, being **legal requirements** within the Americans with Disabilities Act (ADA).

The other, being the **social responsibility** to promote inclusivity within your institution, which is usually a priority of non-profit institutions.



Interestingly enough, and which can be specific to museums, the United Nations mentions the need for art and culture to be accessible to all in Article 27 of their **Declaration of Human Rights:**

(1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.
(2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

Therefore, museums hold a special responsibility to increase access to the cultural objects in their collection, as in a sense the objects belong to the community.

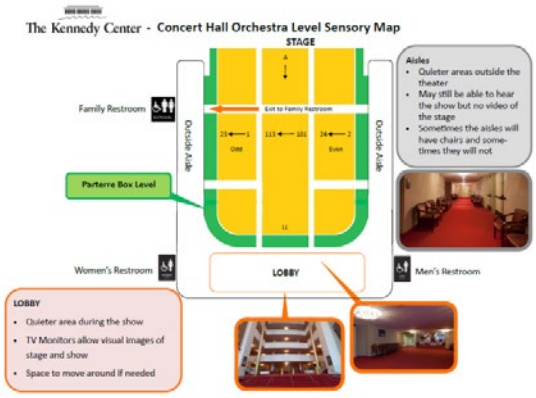
Product Landscape

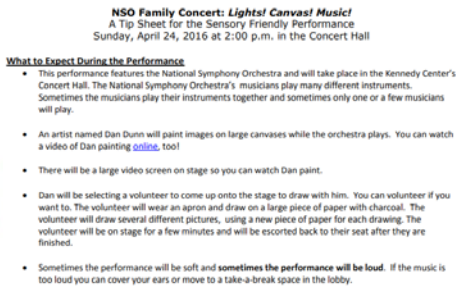
It is important to look at pre-existing solutions that address usability and accessibility when brainstorming for your own institution. Though they may not be entirely flawless, they are tried and true and used by real people. This is valuable information to take advantage of to help advance the museum. In my research I discovered that many museums around the world have programs in place to accommodate to visitor needs. Here are some highlights:

Denver Art Museum

the Denver Art Museum uses ‘social guides’ to help “for families with children with autism, first-time visitors, and others who prefer to prepare for new environments and situations.”

The Kennedy Center





The Kennedy Center considers ‘sensory friendly’ performances and experiences and additional tip sheet for families

Focus: DIET

Digital Infrastructures and Emerging Technology

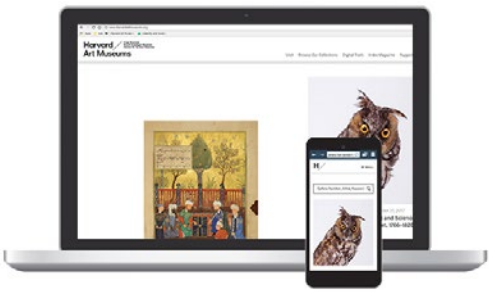
Though my initial research was broad, my project for the summer was focused around specifically the Digital Infrastructures and Emerging Technology (DIET) department in the Museum. I tested existing technology devices to gauge the user experience and to look for possibilities to incorporate accessibility options. The research and testing can actually apply to the whole museum as:

Problems that currently don't involve technology could be solved with technology

The process of testing and learning from results is a model that can be applied to devices of any media in any part of the museum - including printed materials, spacial layout, descriptions written or said, and more.

DIET focus areas:

web: mobile and desktop

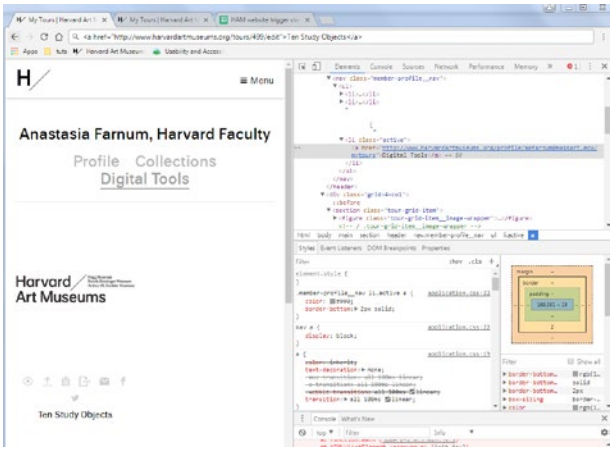


digital signage and interactives

Lightbox Gallery

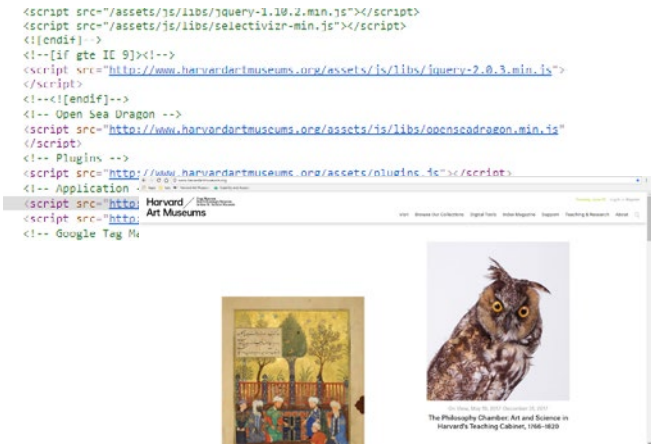
Testing the Website

The Harvard Art Museums website was designed externally with the ability to be responsive to the different technology devices someone may use (computer, tablet, phone). The museum took in the site and it is now a shared responsibility between DIET and Design (aside from content contributors who are across many departments).



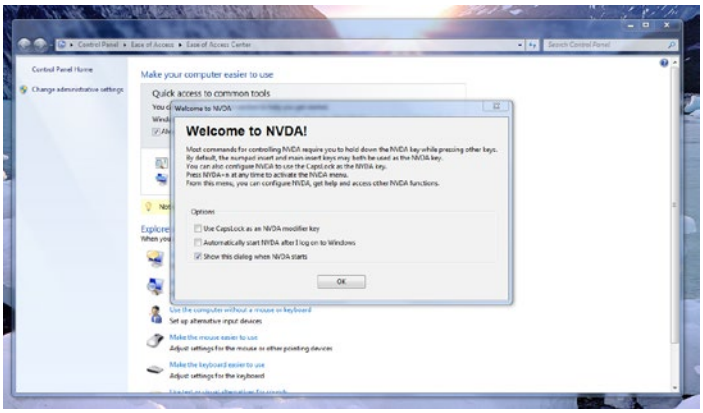
While the website was made by a design team, the Harvard Art Museums has the ability to edit how it functions in order support their target audience. Through a discussion I had with a prominent web developer this summer, we considered how an emphasis on following or creating design trends impacts the accessibility of the website. Web developer Ethan Marcotte made a valid point when he said:

"I've argued that some of the most important things in our industry, like accessibility and performance, are short-changed because we treat them as somehow distinct from design. Accessibility shouldn't be considered a separate practice/process: it should be a pillar of the design process."



Currently, the web presents itself as a very visual experience. As someone who uses the web without assistive devices, it's hard to imagine another way to experience the web.

Testing accessibility for the web can be done from the backend of the site by going through the code, or can be checked through user testing with the front end of the site. Unfortunately during my time in the summer, I did not get to do accessibility testing with users who need assistive devices for the web. I do recommend doing this testing eventually, and the User Research Center at the Lamont Library can provide a pool of testers, some with accessibility needs.



Testing a Screen Reader: NVDA

NVDA (NonVisual Desktop Access) is a highly popular screen reader for websites, that reads the content on the website as you mouse over them. I found it difficult because I realized how much patience is needed to go through a page since I can't quickly scan over sections of a website by looking at it.

Takeaways:

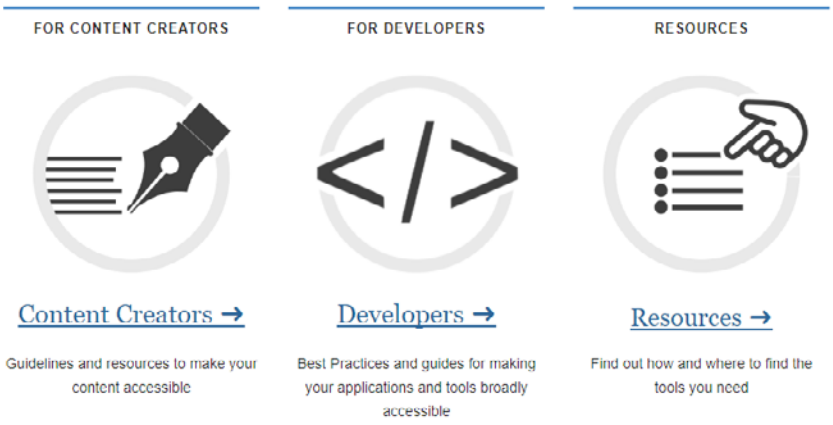
This needs to be tried with users who are already use screen readers; they could give the best insight

Not having alt tags on pictures makes for a chaotic experience

Layout, spacing, and size of categories really impact the experience when using a screen reader.
Suggestion: Perhaps adjusting the page would alter the design more than desired for branding purposes, but what about offering an alternative way for the page to be presented? just how a browser can zoom, and browser extensions can alter the content to help for accessibility, why not offer a version of the website that works better with assistive devices? If made/sourced by the museum, it can be a version that works better than and fits better within desired branding, that a browser extension's version of the site.

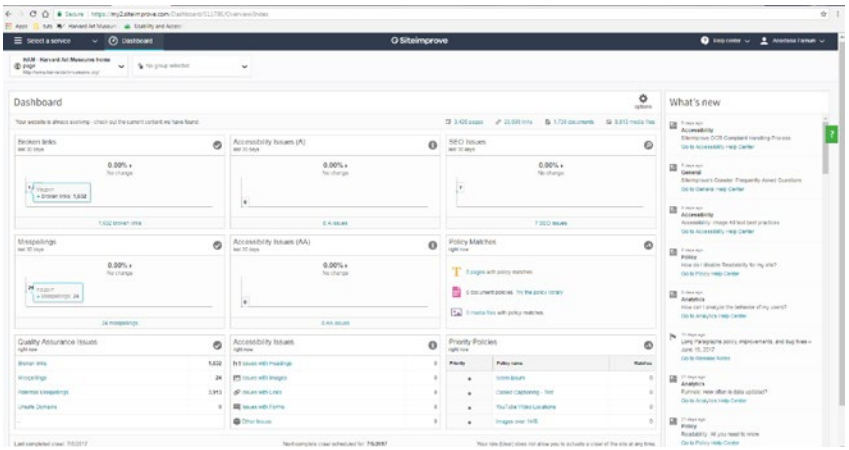
Scanning the Website:

There are currently over 3,400 pages within the Harvard Art Museums website. A website scanning tool is an efficient way to screen the code for the site and find places to improve the code to make the site better for accessibility. There are tools that can do a full "crawl" of the website or a scan of a single page. Harvard University Information Technology (HUIT) offers Harvard affiliates SiteImprove and AMP* accounts, which scan every page of a site.



Shown above are some of the categories HUIT offers accessibility tips and tool in

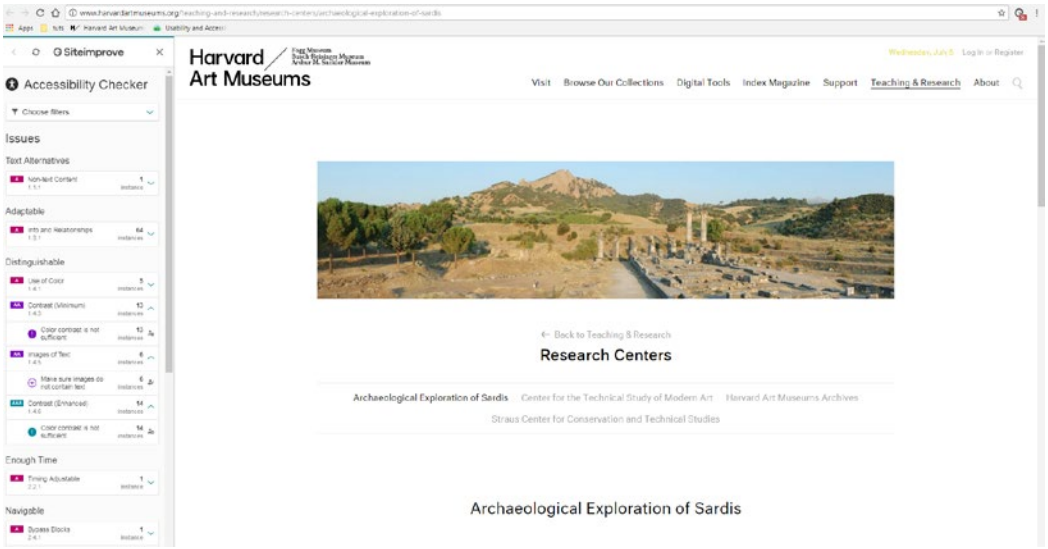
SiteImprove:
Organized and thorough but is disabled by broken pages. Try this test again with guidance from HUIT.



SiteImprove's scan goes beyond accessibility. It looks into broken links, forms, misspellings, search engine optimization options and more. It can help make a website error-free and more usable. I used SiteImprove to take a deeper look at accessibility issues as it separates them into 3 tiers of severity.

SiteImprove also offers an extension for Chrome. This scans by only a page-by-page basis but does it thoroughly.

Interesting find - the colored date and clock on the website don't provide enough contrast for people with low vision.



WAVE web scanner:

WAVE is a scanning tool that checks web sites on a page by page basis. It was able to pick up very specific issues which helped to propose areas of interest for further testing and research.

It's good for a getting a set of example issues in a specific area of the site.