

Beyond audio:

A guide to accessible digital content for visitor attractions and directed tours

Technological best practices to meet the challenges of accessibility by delivering inclusive content.



Exciting new digital strategies to address the needs of customers with differing abilities in terms of sight, hearing, and languages, thus increasing access to visitor attractions.

Digital accessibility: Where are we today?

In the pre-digital era, a great deal of work was done without the use of technology to create environments that maximized accessibility for all. Some examples include the braille tactile reading and writing system, the development of American Sign Language, and closed captioning (discussed below). Today, the need to address and cater to a wide range of abilities in society has never been stronger.

This need is given wings by the current advent of the Fourth Industrial Revolution, enabling a plethora of new technologies and techniques to enter the field. Broadly, this includes automation, machine learning (ML), machine-to-machine communication (M2M) and the internet of things (IoT)—the building blocks of modern, ubiquitous smart technology.

Public institutions and museums have been leaders in accessibility development for decades. Universal Design for Learning (UDL)[\[6\]](#) has been widely used as a design model for museum programs and exhibit spaces.



One leading UDL report is Inclusion, Disabilities, and Informal Science Learning from the Center for Advancement of Informal Science Education (CAISE)[4]. This report emphasizes the physical, cognitive, and social inclusion of visitors with disabilities; however, the report goes well beyond guidelines for physical visiting spaces.

UDL also promotes the principle that digital usability should not be a barrier for people with differing abilities and processing styles. Digital usability, expressed through information and content provided for learning and understanding, should be designed so that people with a wide range of abilities can engage and interact with it.

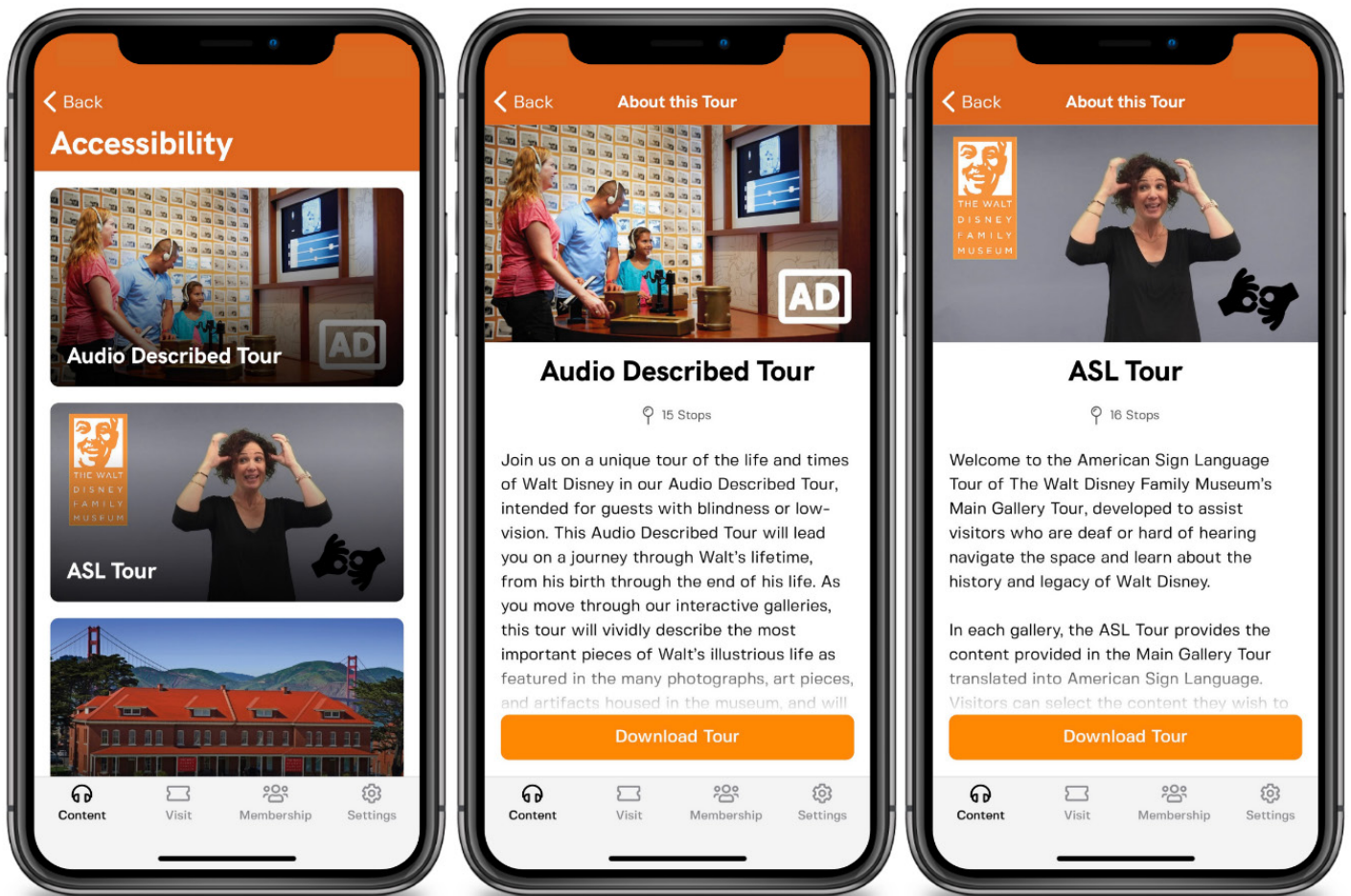
Digital usability is concerned with addressing accessibility in three key areas:

- Sight and hearing impairments
- Learning disabilities
- Overcoming language barriers



Here we explore how to meet the challenges of maximizing accessibility in the three areas above to provide greater inclusivity. Primarily, we focus on using best practices in technology to create and deliver approachable content that enhances the user experience for all.





1. Hearing related accessibility issues

Problem

Some people are born with hearing impairments while others lose their hearing from accidents, infections, or industrial exposure to loud noise. While there are a variety of ways to restore some level of hearing affected individuals, many may never fully regain hearing.

Thus, with a spectrum of causes and solutions comes a spectrum of varying hearing levels within this group. This means that there is an inherent inconsistency associated with relying on restored aural capability for communicating with hearing impaired people.

With this in mind, vision is a key element in supporting all levels of hearing capabilities. Accessibility practitioners need to focus on maximizing engagement with the hearing impaired by placing an emphasis on communicating through visual means.



Solution

The written word is often the first choice for communicating visually. However, it is unrealistic to rely solely on written content, especially considering potential sight or language barriers. There are creative solutions to this need, such as wayfinding signage in a physical public space.

This kind of signage often incorporates or combines internationally adopted pictograms with keywords native to the territory to guide those navigating public spaces to locate places such as restrooms, emergency exits, food service, and so on.

As one of the richest forms of media, video is also widely used for visual communication. The audio track is an important element, as video is enhanced by dialogue, commentary, sound effects and music. That means that closed captioning of the audio track or sign language interpretation can add a lot of value to video content for hearing impaired individuals.

The history of closed captioning can be traced to the 1960s prototype work by Professor Alan Newell at the University of Southampton, England. It was first demonstrated in the US in 1971 at the First National Conference on Television for the Hearing Impaired in Nashville, TN. Closed captioning services for pre-recorded material began in 1979 and real-time services commenced in 1982.

The history of sign language dates to around 1570 in the form of British Sign Language (BSL). However, dating from the early 19th Century, American Sign Language (ASL) is more widely adopted.

Digital systems that include video support for closed captioning and ASL are both effective ways of delivering content for those with hearing problems.

Things you can do:

1. Add transcripts to your audio and video files
2. Provide sign language versions of your content
3. Add closed captions to your video files

Did you know STQRY allows you to easily convert text to speech using voices in multiple languages and accents?





2. Sight related accessibility issues

Problem

As with hearing impairments, some people are born with sight impairments or fully blind. Injury, infection, aging, and spontaneous events such as retinal detachment may also cause loss of sight. Once again, differing sight abilities and their solutions necessitate a spectrum of outcomes.

Visual impairments place an emphasis on using hearing to compensate when communicating. This means that this group will maximize their experience and find more engagement with audible content.

Solution

Described audio is a well-tested digital solution that cultivates engagement for visually impaired people. Description provides access to people who cannot see the full visual video content. It describes visual information needed to understand the content, including text displayed in the video.



The origin of described audio dates back to research in the 1960's and 1970's that explored the use of television by visually impaired people. It found that despite frustrations due to their inability to enjoy the full experience, television was still a big part of their lives.

By 1990, WGBH-TV in Boston developed the first integrated audio description service called Descriptive Video Services. Since then, an entire generation has grown up with the expectation that described audio services be provided to assist communication. Older generations expect described audio services as well, but millennials are the first generation of true digital natives with high expectations for communication inclusivity.

The traditional audio tour is another way to address the accessibility issues of people with sight impairments. This digital technology solution works best in museum or public exhibit settings.

For people with low vision who may not be fully blind but still require visual assistance, accessibility features such as varying text sizes and image zoom capabilities should be available.

Colorblindness is also a consideration when creating visually accessible content for all visitors. For example, if someone has red/green colorblindness and those colors are used to code certain signifiers, they will not be able to understand them. Incorporating words in the form of text or audio into the content will allow for wider understanding.

An effective digital solution to support visitors or customers with visual impairments should utilize these tried and trusted accessibility features, which are all available on the STQRY platform.

Things you can do:

1. Write descriptions for your images
2. Provide an audio described version of your tour
3. Choose colours with proper contrast
4. Choose a platform that supports accessibility features of the device





3. Language related accessibility issues

Problem

According to Ethnologue Languages of the World (2021, 24th edition)[2], there are approximately 370 million people with English as their first language; however, depending on the criteria, those with English as a second language range from 1.35 to 2 billion people.

No matter the first language in this group, fluency in a second language is likely to be highly variable. For visitors trying to obtain the most out of a cultural, entertainment, or leisure visit, relying on patchy English can be an underwhelming experience and source of frustration. When it comes to accessibility for non-native English speakers, providing translated content is a necessity for ensuring a seamless experience.



Solution

Foreign language support for the world's most widely spoken languages is something of an expectation. Governments in multicultural countries have invested significant amounts of money to ensure that official communication and centralized citizen services provide content translation into dozens of languages. This includes languages spoken by minority ethnic groups, showing that multilingual support needs to reach beyond Roman character languages to create comprehensive inclusivity.

Foreign language content translations are readily accommodated by today's digital technologies. Therefore, it is possible to deliver content in practically any language and provide a number of language options to content consumers.

It is important to note that translation is not just for written communications. Providing translation through subtitles for video content is a key consideration as well.

The best technology solutions currently available support the most widely spoken Asian and European languages, along with Right to Left (RTL) languages such as Hebrew and Arabic. Class-leading technologies enhance the RTL language user experience further by supporting RTL for usability features, such as screen swiping and tab bar reversal.

Things you can do:

1. Provide your content in multiple languages
2. Add versions of your tour tailored to different audiences
3. Simplify your writing style

Did you know STQRY can translate your text into multiple languages?





4. Personal mobile devices vs. specialized hardware devices

Problem

Solutions for delivering digital content invariably require a hardware device. Some methods require the museum, gallery or attraction to provide a standard device, such as a generic Android tablet or iOS Apple iPad loaded with specialized software.

Some solutions for providing accessible content may require proprietary hardware devices. This may be advantageous, especially where there is a desire for an attraction to provide an augmented reality (AR) or virtual reality (VR) experience within the environment. Often, such advanced capabilities may only be achieved with proprietary hardware.



Solution

For most scenarios where the lead objective is to broaden accessibility, sites tend to gear their strategy toward smart digital technology that uses smartphone apps to deliver content. While this is advantageous because smartphones have widely accessible features, a hybrid solution also works well.

Mobile web apps, native apps, and on-site rental devices all have their place. Having all three options available inherently makes your content more accessible to anyone who may not have a smartphone (they can use rental devices), or those who don't have space on their phone to download another app (they can use web apps).

Things you can do:

1. Provide your content on multiple platforms. Web and native, phone and tablet
2. Support a wide range of devices, especially older devices
3. Keep a few on-site devices on hand for those that don't have smartphones

Did you know that STQRY can run on web, native, and rental devices without having to author content in multiple places?



5. Accessibility features on smartphones and tablets

Most smartphones and digital tablets have built-in assistive technology (AT) so that users do not need special apps to use these built-in AT features. Text-to-Speech (TTS) is a prime example, as it reads out written content while integrating language translation and speed control.

AT features are activated and controlled via the device's operating system. The range of AT features varies depending on the operating system. Apple iOS devices such as iPhones, as well as Google Android devices including Samsung Galaxy phones, all have built-in AT tools.

However, it is important to ensure that apps are customized and optimized to respond to the built-in smartphone AT, and go above and beyond this technology to create the best possible experience for every user.

The precise way that AT features assist the user are very specific to the user's individual needs. Generally speaking, the leading technology solutions for accessible content creation and delivery are designed to leverage the built-in AT features of these operating systems as much as possible. This is advantageous because smartphones have widely accessible features, a hybrid solution also works well.

Mobile web apps, native apps, and on-site rental devices all have their place. Having all three options available inherently makes your content more accessible to anyone who may not have a smartphone (they can use rental devices), or those who don't have space on their phone to download another app (they can use web apps).

6. Perspectives of attractions and customer experience (CX)

The business models of museums, galleries and visitor attractions vary enormously. Examples of key common activities across these industries include academic research, arts and humanities services, leisure and entertainment, cultural enrichment, and more across both public and private sectors.

Some might offer free admission by virtue of government or municipal funding subsidies, while others need to self-fund by generating profit through revenue streams such as admission, merchandise, food service, and premium experiences for VIP or corporate members as well as the general public.



However, no matter the business model, there is a need to generate footfall and attract the numbers needed to secure funding or drive revenue streams.

From the perspective of museums, galleries, and visitor attractions, there is a need to maximize engagement to provide a great experience for all, driving positive feedback and wide-reaching social approval.

From the perspective of visitors through the lens of customer experience, today's audiences have high expectations. That might be a knockout ride on a roller coaster or standing before a revered work of art. The key is to be memorable and to drive satisfied customers to relate their experiences to friends and family through word-of-mouth (WoM).

Today, WoM has expanded into digital channels. Social media exerts a powerful influence and the need to leverage social proof is strong. This means that negative feedback can be scathing and social comment highly counter-productive.

The economics of museums and tours mean ticket prices can be significant and costly. To provide value, every visitor or participant must be able to maximize what they take away from their experience. Ensuring that accessible digital content supports memorable customer experiences is a highly important consideration.

Things you can do:

1. Make your visitor experience memorable
2. Drive satisfied customers to relate their experience to friends and family
3. Make it easy to share their experience online





7. Meeting 508 compliance and similar obligations worldwide

Problem

The Section 508 amendment to the United States Workforce Rehabilitation Act of 1973^[5] is a federal law mandate requiring that all electronic and information technology developed, procured, maintained, or used by the US federal government be accessible to people with disabilities.

An update of Section 508 took effect in 2018 with an intention to bring American standards more in line with international accessibility efforts such as the World Wide Web Consortium's Web Content Access Guidelines 2.0 (WCAG 2.0)^[7].

Observance, therefore, involves developing digital content that can be used by people with limited vision or blindness, deafness, seizure disorders, and other disabilities. Developed economies worldwide have similarly intentioned regulatory requirements and guidelines in place.



Key methods of providing accessible content that meets compliance with section 508 and similar instruments include:

- Closed Captioning and Subtitles
- Screen Reader Capability
- Accessibility with Keyboard
- Skip Navigation Links
- Alternative Image Text
- Alternative iFrame/ Video Text
- Color Allocation and Contrast
- Color Schemes and Page Layout for Seizure Avoidance

Solution

The best digital technology solutions to 508 compliance avoid the common regulatory pitfalls by enabling adherence to accessibility criteria. To truly support content that maximizes accessibility, the best solutions should interweave process and best practice, and promote a culture of accessibility amongst those creating content for visitors.





8. Best practices for creating accessible content

Problem

To ensure that content is as accessible as possible, there is a need to develop a consistent approach—a process—that allows a repeatable set of actions to be applied to content. This is true across the board for content for the sight and hearing impaired, for those with learning disabilities, and for translated content.

WCAG 2.0 sets out four principles for accessibility guidelines: perceivable, operable, understandable, and robust.

Underneath these pillars are approximately 90 individual guidelines elaborating on specific aspects of each. Collectively, this defines a structured and consistent approach to the process of designing accessible content.



The WCAG 2.0 standards highlight one of the most important aspects of optimizing content accessibility. It emphasizes the importance of paying attention to the fine details during the content design process, ensuring that opportunities to make content as inclusive as possible are not missed.

Solution

There are a number of solutions for creating an accessible content process. The best technologies support creation of accessible content by interweaving WCAG 2.0 adherence into their platforms and promoting a culture of accessibility for the content creators themselves.

Although optimizing accessibility is largely about considering the smallest details, some technologies that are currently available fail to provide the capability to fine tune content presentation.

For example, an appropriate solution should provide smart TTS tools. Instead of merely reading out the time remaining in an audio track as, "1.35 seconds," smart TTS allows more precise tuning so that the text is read aloud as, "1 minute 35 seconds remaining."

The Four Pillars of Content Accessibility:

1. Perceivable
2. Operable
3. Understandable
4. Robust



9. The increasing pace of technology uptake

We have entered the Fourth Industrial Revolution, where hardware and software machines do the heavy lifting by performing the tasks that humans make errors in, or the tasks that are repetitive, time consuming, and tedious. This frees us up to do the things we are good at, enjoy, and find more satisfaction from.

We have seen the steady transformation of society by increasing consumption of computer technology. Throughout the information age, practically every area of human activity has been impacted by digital technology. This has come in waves. The current wave, including automation, machine learning (ML) and artificial intelligence (AI) are driving technology forward at an astonishing pace.

The COVID-19 pandemic has accelerated this digital transformation and the adoption of digitally enabled products by several years ahead of previous predictions, according to a recent McKinsey report^[3]. The pandemic drove consumers toward online channels, and industries wasted no time in responding to the increased demand.



As a case in point, some museums have explored how to expand digital offerings to keep revenue flowing in during lockdowns. Social media, virtual tours, live streaming events, and digital content have all been tactical elements.

However, such initiatives can only take you so far. They are no substitute for personal attendance. With audiences already conditioned to expect thoroughly memorable experiences, the pressure to keep up with innovation is on.

Attraction sites that don't embrace advances in technology run the risk of falling behind. Ultimately, this may impact footfall and damage profitability. Promoting and supporting digital accessibility and inclusivity for all is crucial to success moving forward.

Things you can do:

1. Provide virtual tours
2. Live stream special events
3. Make your collections, exhibits, and experiences digitally accessible

Did you know that STQRY can facilitate all of these endeavors on its platform?

Fortunately, using the right technological tools, the ability to provide visitors with accessible content that enriches the CX for those that may be impacted by hearing, sight, language, and learning barriers has never been easier.



What's Next?

- The advent of the internet, and the range of complementary digital technologies it has created, makes it easier than ever to create content that engages and overcomes barriers to communicating with those that have difficulties with sight, hearing, learning, language or a range of other differing abilities.
- The latest leading technologies like the STQRY platform are designed to make the process of creating accessible content relatively straightforward.
- The case for adopting such technology is becoming more compelling because it is instrumental in avoiding failures of 508 compliance and similar legislative instruments worldwide.
- Hearing, sight, learning, and language problems are not simple "can or can't," or "yes or no" issues. In general, it is important to keep in mind that abilities are on a spectrum.
- This means ensuring the creation of fit-for-purpose accessible content requires nuanced approaches and solutions that support attention to detail and are process driven to cultivate consistency.
- To ensure that accessible content creation and delivery is as inclusive as possible, it is essential to apply quality management and continual revision and improvement of the process.
- Future technology advancements, such as STQRY's Kiosk platform, are likely to enable further refinement and optimization to improve the ability to engage with visitors across these spectrums.
- As the technology evolves, it is recommended that accessible content practitioners keep up-to-date by using such methodologies as collecting feedback from all groups mentioned above, and reviewing the latest research findings in terms of best practices.



About STQRY

STQRY provides award winning digital storytelling platforms to help your audiences explore, engage, and discover destinations in new ways. The STQRY team has worked on thousands of projects worldwide since our inception in 2006 with clients ranging from museums, parks, attractions, cities, tour operators and historic sites of all sizes. Using the STQRY Builder you can choose from a range of amazing features to create location-based tours, virtual tours, mobile, and web apps, audio guides, games, and online collections.

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Further Reading

[1] Creativity and Innovation at Work: Tours for People with Disabilities

O'Hara, Cate; Museum-Ed

<https://www.museum-ed.org/creativity-and-innovation-at-work-tours-for-people-with-disabilities/>

[2] Ethnologue Languages of the World (2021, 24th edition)

Simmons, Gary F.

<https://www.ethnologue.com/about/this-edition>

[3] How COVID-19 has pushed companies over the technology tipping point—and transformed business forever

McKinsey survey report

<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

[4] Inclusion, Disabilities, and Informal Science Learning

A CAISE Inquiry Group Report

March 2010

<https://www.informalscience.org/sites/default/files/InclusionDisabilitiesandInformalScienceEducation.pdf>

[5] Section 508 amendment to the United States Workforce Rehabilitation Act of 1973

U.S. Government

<https://www.section508.gov/manage/laws-and-policies/#:~:text=Section%20508%20of%20the%20Rehabilitation,accessible%20to%20people%20with%20disabilities>

[6] Universal Design for Museum Learning Experiences

Resources for museum professionals on employing a universal design approach for exhibits, programs, and evaluation.

<https://www.mos.org/UniversalDesign>

[7] World Wide Web Consortium's Web Content Access Guidelines 2.0

Accessibility Guidelines Working Group

<https://www.w3.org/TR/WCAG21/>

