## **Nomnivex DESIGNING FOR ACCESSIBILITY**

GUIDELINES AND CONSIDERATIONS FOR ACCESSIBLE DIGITAL SIGNAGE DESIGN



## art 1:



## **CONTRAST RATIO**

Contrast is the difference in perceived brightness (or 'luminance') between two colors. The contrast between elements in your design is expressed as a ratio ranging from 1:1 to 21:1. The ratio helps you determine how legible your text is. Contrast ratio is a standard used extensively in website and application design to ensure accessibility. We can easily apply this to digital signs.

### **1:1 Contrast Ratio**

A 1:1 contrast ratio - in this example, white text on a white background - would look something like the image below. Can you tell what the text says? No, you can't - because there's no contrast at all between the foreground element, the text, and the background element.



### **21:1 Contrast Ratio**

A 21:1 contrast ratio looks like the image below - black text on a white **background.** Here there is no doubt about the readability of the text black on white is clearly visible.

This is a contrast ratio of 21:1

### SO WHAT IS A GOOD CONTRAST RATIO?

It depends. With website accessibility and using online accessibility checkers, there are different levels of accessibility compliance. For example, large text in a website can be accessible at a ratio of 3:1. Body text ranges from 4.5:1 to 7:1, depending on the classification used.

Considering that most of the text is large in digital signage applications, we can use website standards to form our guide. A higher contrast ratio means better legibility. Look at the examples to the right. The first column shows a 4.5:1 contrast ratio between the text color and the background color. The second column shows a 7:1 contrast ratio, using similar colors. Notice the shift in values in the second column compared to the first.

Increasing the contrast ratio is as simple as changing the colour's hue, saturation, or lightness values.

4.5:17:14.5:17:14.5:17:1

### SO WHAT IS A GOOD CONTRAST RATIO?

A **minimum contrast ratio between 4.5:1 and 7:1** should make your message clear and legible to everyone, including those with vision disabilities.

Again, web standards differ for different scenarios and classifications. Larger text can have a contrast ratio of 3:1, while smaller text can have a ratio of 4.5:1.

Contrast is a great design principle, and using contrast effectively in all aspects of your design always results in a better design. Look at the two images on the right. Image B shows a 7:1 ratio, and the text pops. Image A shows a 3:1 contrast ratio, and the message is somewhat muted.

Consider what you want your message to convey and say. If you feel strongly about using a color that results in a lower contrast ratio, try not to go below 3:1, and make sure the text is large.

### Large Text can have a contrast ratio minimum of 3:1

While smaller text should have have a minimum contrast ratio of 4.5:1

Image A

## But a contrast ratio of 7:1 is better.

While smaller text should have have a minimum contrast ratio of 4.5:1

Image B

### WHERE IS CONTRAST RATIO SIGNIFICANT IN MY DESIGNS?

Where do you need to check the contrast ratio? Pretty much every part of your design. Again, contrast is a design principle and a very important one. Contrast in all aspects of your design usually leads to a much better design.

Specifically, for digital signage applications, you should be checking the contrast ratios for the following:

**Between text color and background color** – as we've shown in the examples, ensuring that everyone sees your message is essential, and a good contrast between these two elements helps ensure that.

**Interactive elements** – buttons and menus are important to an interactive solution's usability. Ensuring these elements have proper contrast will go a long way to making your application user-friendly.



### https://colorable.jxnblk.com/

Colorable is a great online tool that allows you to check your contrast ratio. Sliders allow you to easily adjust hue, saturation, and lightness until you get an acceptable ratio.

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Accessible design means designing for everyone. It's a good idea to take those experiencing color-blindness into account, and how they see your design.

About 1 in 12 men, or 8% and 1 in 200 women, or 0.5% experience some form of color vision deficiency (CVD), or color blindness.

There are three main types of color blindness - red-green, blueyellow, and monochromacy.

Red-green color blindness is the most common, and falls into different categories: Protanopia (people can see no shades of red), Protanomaly (people can see some shades of red), Deuteranopia (people can see no shades of green), and Deuteranomaly (people can see some shades of green).

Then there's the blue-yellow color blindness, or Tritanopia. People with tritanopia cannot distinguish between yellow and blue. This is less common than red-green color blindness.

Monochromacy is another type of color blindess. People experiencing this type of CVD do not see color at all, but rather look at the world in shades of black and white.



Your most significant consideration as a designer when thinking about color blindness is how people with CVD will see your design. Is your message lost? Is your design useless to someone with a particular CVD? Are critical elements in your design not visible for certain people?

A good question to ask yourself is if it's not visible to everyone, does it need to be there?

Contrast can help immensely here. With proper contrast between the elements in your design, people with CVD should view your design and understand the message.

Let's take a look at the digital menu design here and break down the contrast ratios between elements.





The image below shows the contrast ratios for the key elements of the design. You can see they have a pretty high contrast ratio.





So how would someone with a CVD see this? Would the design be as effective to someone who sees color differently?



This image gives us a rough idea of how someone with **Protanopia** would view the design. Without being able to see shades of red, the design takes on a different look all together. Contrast is still high, but it's hard to distinguish the red and brown circles from one another, but the numbers are legible.



We can also see how someone with **Deuteranopia** sees the design. Again, contrast between foreground/background is good, everything is legible, but the red and brown circles are hard to distinguish a difference.

So how would someone with a CVD see this? Would the design be as effective to someone who sees color differently?



When we look at this digital menu through the eyes of someone with **Tritanopia**, or someone who cannot distinguish between blue and yellow, the design holds up well. Colors appear less saturated but you can still distinguish between reds and browns.



People with **Monochromacy** see the world in black and white. Using proper contrast in your design ensures people with monochromacy will be able to read your design.

As a designer, it's your responsibility to make sure the message is clear and legible. Considering people with color vision deficiencies should be factored into your workflow. Keep the contrast between elements in your design sharp, and your design should be readable by everyone.

You can check how people with color blindness will view your design using the online Color Blindness Simulator. Upload an image file of your final design and cycle through the different types of color blindness.



### https://www.color-blindness.com/ coblis-color-blindness-simulator/

Colblindor is a free resource that allows you to upload an image file and see how people with color blindness view the image.



# ART 2: Sypograp

## PART 2: typography

### **TYPOGRAPHY & ACCESSIBILITY IN DIGITAL SIGNAGE**

As designers, it's important to know who our audience is, or rather, who our client's audience is. When thinking about typography and accessibility, think about how it may look to someone with a disability. Will someone with a visual impairment view your design? Will someone with dyslexia view your design? How will it look? What can you do to make sure everyone understands the most important part of your digital sign?

Fortunately for digital sign designers, we can apply some guidelines from the world of print signs to our digital designs.

The ADA Section 703 deals with signs, and they provide quite a lot of guidelines to meet accessibility. If you've taken a look at some signs out in the world and noticed a lot of similarities in their design, it's likely due to meeting compliance standards. In this section, we'll take a look at some of the compliance standards and how we can apply them to digital signs.

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## ypograpny

### WHAT'S IN A TYPE? SERIF OR SANS-SERIF

There's a reason most signs you see out in the real world use a sans-serif font. ADA 703.2 sets guidelines for raised characters on signs, and 703.2.3 states characters should be sans-serif.

703.2.3 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

Most public-facing signs do use raised characters, and signs with visual characters (not raised) often match signs with raised characters.

ADA 703.5 outlines guidelines for visual characters, and 703.5.3 does not specify you must use a sans-serif font. It simply states that characters shall be conventional in form.

703.5.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

So what is best to use for signs? Sans-serif or serif?



## ypography

### WHAT'S IN A TYPE? SERIF OR SANS-SERIF

Since digital signs use visual characters, it's safe to assume there's no requirement to use a sans-serif font. The only requirement is characters shall be conventional in form. Times New Roman, a popular Serif font, is perfectly acceptable to use on a website, as the characters are very conventional in form, and we can assume it would be safe to use on a digital sign.

The question then becomes what we should use, as opposed to what we are required to use. There's a reason sans-serif fonts are required for raised characters. Many people find sans-serif fonts easier to read, cleaner, and less distracting. It's generally agreed that sans-serif fonts are more accessible. You typically find serif fonts in large bodies of text, such as newspaper articles or books.

So - stick to what's best. People associate sans-serif fonts with accessibility and find them legible and easier to read on the web. Digital signs aren't much different from a computer screen, so we can safely apply the same logic to our digital sign designs.

If you want to use a serif font, make sure the characters are conventional in form. Don't choose an overly decorative font.

Choose something like:

Arial Century Gothic Helvetica Tahoma Verdana Do not choose something like:

Monotype Corsiva luckyFellas CUEICFIVE <u>Typewriter</u> BATTERY PARK

Avoid overly decorative fonts with unconventional characters for your message. Use them as part of your visual design as a graphic element, but keep your messaging clear with a sansserif font.

### WHAT MAKES A FONT ACCESSIBLE? IT'S MORE THAN JUST A TYPE

We've gone over sans-serif fonts being the most recommended type of font when designing for accessibility, but what else is there to consider? What makes sans-serif fonts more accessible? And are all sans-serif fonts created equal?

Choosing the right sans-serif typeface helps a lot. The design of characters in a typeface contributes a lot in determining a font's accessibility level.

Look at the example to the right. Which font do you find easier to distinguish between the characters, Font A or Font B?

All sans-serif fonts are not created equal when it comes to accessibility.



**Font A –** can you tell which character is the number one and which character is a lowercase L?



**Font B -** with this sans-serif font, it's much easier to differentiate the characters.

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## ypegraphy

### WHAT MAKES A FONT ACCESSIBLE? IT'S MORE THAN JUST A TYPE

Additionally, avoid typefaces that use mirror opposites for some characters. Lowercase letters d and b tend to mirror, as do lowercase p and q letters. Typefaces that have distinguishing characteristics in these letters are more accessible, as they help with character differentiation.

bC

Notice how the b and d in the example above look like mirror images. This could be difficult for someone with dyslexia to distinguish.

## bd

This example, however, a sansserif font called Agenda, gives the lowercase d a bit of unique, making it visually different than the lowercase b.

## ypegraphy

### WHAT MAKES A FONT ACCESSIBLE? IT'S MORE THAN JUST A TYPE

If you're a typography geek, you know what ascenders and descenders are. But if you're not, ascenders are the parts of lowercase letters that extend beyond the x-height of a font. Descenders are parts of characters that descend below the baseline.

Properly designed characters with prominent ascenders and descenders aid in legibility, as they help make their characters easily identifiable. Selecting a font family with distinct ascenders and descenders is a great place to start.



## ypograpny

### WHAT MAKES A FONT ACCESSIBLE? IT'S MORE THAN JUST A TYPE

We can't talk about the importance of unique character design without talking about the space between letters in a font. Kerning is the space between your letters and, just like uniquely designed characters, can help a great deal with your design's legibility.

Tight kerning typically results in a lower legibility. Letters lose their uniqueness and the separate letter shapes become harder to visualize and distinguish. In extreme examples, such as the one on this page, people without disabilities would experience reduced readability.

Font designers spend a lot of time designing their characters, but when deciding on a font, check the natural spacing between the letters, and look at how some letters naturally line up with each other.

In addition to the space between letters being important, the space between line in a paragraph is also important. Try to use line spacing of at least 1.5 times the font size. While paragraphs of text are not common in most digital signage applications, they do exist, especially in news story feeds and some types of announcements. To illustrate the importance of kerning, take a look at these two words. What do you see?

## modem



With proper spacing between the characters, we see the words are much more legible.

modern

barn





One advantage digital has over print media is the ability to add interactivity to your digital signs. In this part of the book, we'll go over some considerations to think about when designing an interactive solution, and look at how we can use the Omnivex software to aid with accessibility.

When designing solutions for interactive kiosks, you have a bit more flexibility to customize and personalize the user experience, making the solution more accessible for everyone. With kiosk solutions built using Omnivex software, you can easily add options to move menu buttons to more accessible areas, integrate a high-contrast color option, or allow users to increase font size.

Before you start designing your interactive digital signage solution, it's a good idea to find out how and where it will be used. What kind of display? Will it have a portrait or landscape orientation? What type of enclosure will it encompass it? For wheelchair accessibility, kiosks that are sloped, usually between 15 degrees and 20 degrees, are generally recommended. Sloped kiosks at this angle are generally easier to use



When a person is seated in a wheelchair, the maximum height for a safe **forward reach is 48 inches**.

## INTERAC

## **INTERACTIVITY** & ACCESSIBILITY

If using a standing vertical kiosk without any slope, ensure your design doesn't require the user to reach higher than 48 inches, or lower than 15 inches.

Know where it's going to be, what the kiosk is going to be standing on, and determine where on your touch-screen your accessible area is.



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If mounting a touch-screen on a wall, make sure it does not protrude more than **four inches from the wall**.

The minimum height should be 27 inches and the maximum height should be 80 inches.

**ALSO NOTE** that these guides change slightly depending on whether there is an obstruction in front of a kiosk so, like any design project, get as much information up front as you can!

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4"

**80**"

**48**″

## **INTERACTIVITY** & ACCESSIBILITY

### MAKE YOUR SCREEN OPTIONS ACCESSIBLE!

This is where finding out all the information on placement, kiosk model, the environment it will be placed in - can be put to use to designing an interface that everyone can use. Let's start with the accessible part of the screen.

We know the maximum safe forward reach of someone sitting in a wheelchair is 48", so it's important that any options on the screen a user will need to tap are within the accessible area.

Knowing this accessible area is vital to designing a good user experience.

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### MAKE YOUR SCREEN OPTIONS ACCESSIBLE!

Take a look at this illustration of two kiosks.

The kiosk on the left side shows buttons on the that people in a wheelchair would clearly have trouble accessing. They are above the accessible area.

The screen on the right, on the other hand, the menu options are laid out in the accessible part of the screen, where someone in a wheelchair can easily access and use the menu options.



### MAKE YOUR SCREEN OPTIONS ACCESSIBLE!

You can also create an accessible option for people to activate, simply by creating an accessible button and placing it in the accessible part of the screen.

When activated and accessibility is turned on, you can change the position of the menu and the overall design.

This is very easy to do with Omnivex software, and does not require any code. Setting up options like this that allow the users to control how they experience the kiosk goes a long way to their overall user experience.



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### **CREATING AN ACCESSIBLE OPTION**

Omnivex software enables you to easily create a solution that allows the user to customize how the screen displays, no coding required!

Let's start with making an accessibility option. This is as simple as adding a button that says "Accessibility", or even better, using an icon.

Icons are a universal visual language (more on that later) and, from a design standpoint, much more visual and can save space.

ADA 703.7.2.1 outlines requirements for the International Symbol of Accessibility. Check that for guidelines if you do have to be ADA compliant.

A symbol or icon or the word "Accessibility", or both - are good ways to identify there's something here to make this experience better.



### The Accessible Icon Project

(accessibleicon.org) designed this icon as an update to the traditional symbol of accessibility, and it's free to use.

You can find it on their site, as well as a write-up of the project and why they're doing what they're doing.

## INTERAC

## **INTERACTIVITY** & ACCESSIBILITY

### **CREATING A HIGH CONTRAST OPTION**

Another code-free feature you can add to your interactive kiosks with is a high-contrast mode.



Use an icon, a word, or both to identify the Contrast Mode option.

Providing people the option to adjust the contrast to more easily read adds to their overall user experience.

It's easy to build layouts using Omnivex software and databind properties, such as background, fill color, text color, and be able to switch modes around at the press of a button.



A simple example of how easily a layout's appearance can change with the tap of a contrast button.





### ADJUSTABLE FONT SIZE

You can also add options to adjust the font size. Again, Omnivex software makes this an easy, practically effortless feature to add.



Predefined sizes, such as Regular, Medium, Large give you more control.

You can also add buttons that increase or decrease the font size with each tap, and set a limit on the largest font size possible, just so your overall design is still usable and cohesive.



Allow the user to change font size for better readability

EMERGENCY EXIT

EMERGENCY EXIT

### **USING ICONS**

A famous American graphic designer, Paul Rand, created a version of the IBM logo with icons, visually lining up an image of an eye and a bee before the letter M, in the same characteristic style as their iconic logo. It's a famous example of how we can use icons to communicate.

Icons are great to use in kiosks, and they can help with accessibility. Just remember to use universal icons - don't make people guess what they mean. And remember - all the rules of color and contrast apply to your icons as well! Don't use an icon that will be difficult for people to understand. When using universal icons, such as an accessibility icon or an emergency exit icon, try to keep the colors consistent so they are instantly recognizable. Don't change what's not broken! The top row of icons in the graphic below are acceptable - contrast is strong, and the colors make the icons instantly recognizable.

The bottom row are examples of what not to do with icons. Contrast is way off, icons are hard to make out, and a universally recognized icon's colors are altered.

### WAYFINDING DIRECTIONS

You've created an incredible wayfinding solution that allows users to click a location and see directions from where they're standing. You've thought about everything on the screen, built-in all the accessibility options necessary, and are ready to deploy.

Have you identified the accessible routes? Are the routes you've outlined as directions to locations in the building or facility grounds accessible by someone in a wheelchair? Are there some locations that are not accessible? What happens if construction or equipment malfunction temporarily hampers the route accessibility?

Keep in mind the need to identify routes as accessible or to point out when unforeseen circumstances may limit accessibility. If people find what they are looking for and get the directions only to find out after leaving the kiosk that they have to climb stairs, it diminishes their overall experience. And, more importantly, it does not get them where they need to go.

If climbing stairs is part of the destination route, point it out clearly in the directions. Or consider labelling buttons for accessible destinations - this will clearly tell the user which routes are accessible and which routes are not. Conference Room A

### Conference Room B

Conference Room C

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Contact Omnivex to learn more about digital signage and how our software can help your business.

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