Table of Contents

**Chapter 1:**
A History of Digital Signage ................................. 4

**Chapter 2:**
Digital Signage Benefits ................................. 14

**Chapter 3:**
10 Biggest Digital Signage Challenges ............... 25

**Chapter 4:**
What to Look For in Digital Signage Software (CMS) ... 38

**Chapter 5:**
Digital Signage Hardware: What to Look For .......... 50

**Chapter 6:**
Cloud-Based Digital Signage ......................... 65

**Chapter 7:**
Google Chrome for Digital Signage .................... 78

**Chapter 8:**
What Content to Put on Your Displays ............... 93

**Chapter 9:**
Installing and Rolling Out Digital Signage ........... 105

**Chapter 10:**
Keep Up with Digital Signage Trends .................. 115
The History of Digital Signage
1990’S TO TODAY:
A History of Digital Signage

Digital signage is a powerful technology, and you may have been involved with it for years, but do you know the origin story of this technology?

How it’s evolved over the years?
If you’re looking at recent examples, there are some pioneers who use digital signage in fascinating ways.

We’ll dive into the origin in just a second, but first, I want to give you an example of what digital signage has evolved to (there are a lot of examples to pull from, and a lot of technological innovation, but here’s a small taste).

In late 2014, Nordstrom installed a digital denim kiosk in one of their stores so that customers could find out which jeans would look best on them without actually trying them on.

Can you imagine such a campaign?
Nordstrom did.
And their sales skyrocketed.

By answering a few key questions on a touchscreen, any customer could find out what style and size was ideal for her body type. The customer could then go fetch those jeans from the rack, try them on, and head to the checkout happy.

No more struggling to find the “perfect” pair for entirely too long in the confines of a small dressing room. Now the customer could discover what she needs quickly and spend more time on the store floor instead of in the back of a dressing room.

This kind of customer engagement is a game changer.

And Nordstrom’s digital denim kiosk is just one of thousands of potential digital signage campaigns, each targeted to a certain kind of user and designed to leverage unique strengths of different pieces of hardware.

From holograms to jumbotrons, campus wayfinding, to tablesider ordering kiosks, there’s a truly dizzying array of digital signage out there.

All these uses of the technology have a common root.

Digital signage had its beginnings in fashion houses in the 70’s… or perhaps banks and trade shows in the 90’s…

How it started is really affected by how you define digital signage.

It’s difficult to define digital signage because the term covers an ecosystem of uses.

Our definition of digital signage is: software content management system that drives communications to a variety of screens.

But I need to really emphasize this point that digital signage is a catch-all phrase, so that’s why the definition might not shine a ton of light into what it would look like. The term ‘digital signage’ has been around for a long time. As the technology evolved and the market penetration grew, the naming conventions evolved with it. You might know it as ‘screen media’ or ‘interactive customer experience’ or ‘visual display.’
Chapter 1: History of Digital Signage

To understand the roots of digital signage, you have to look back—way back!—to the beginnings of sign-based communication itself, not necessary to the beginning of how we think about digital signage traditionally.

I put together 5 examples of how some of the biggest brands in the world use digital signage in awesome ways.

The PDF outlines exactly what strategies and solutions these brands are using in some of their flagship stores internationally. You can bookmark it, print out, or keep it in a folder for reference. Get your PDF here.

The Road to Digital Signage

The Way, Way Back History

Way back before technology was born, when signs were merely etchings in stone, people sought out better means to find their way around.

The world is big, after all, and we can’t possibly know where we’re going all the time.

When stone walls weren’t available along paths to etch on, settlers took to bending young trees a certain way to point travelers in the direction of an important place.

It worked for a while, but like most things we create, the technique soon begged an upgrade.

Some time after cavemen shed their animal skins and dusty roads were marked out with boots and hooves, the motorcar was built. People everywhere stood in awe of the electric vehicle. But without proper signage, they were as lost as the early settlers were.

The chaos of unmanaged traffic preempted the need for traffic engineers: Smart people willing to take the time to think of a process that could show people the way.

The engineers began to create sign systems that consisted of road signs, arrows, and other wayfinding methods that took the pain out of exploring unchartered territory.

As engineers were painting lines and arrows, a car salesman was ordering the first ever neon sign. It was 1929. Created with the newly invented neon tube that could be bent all sorts of ways, the neon sign was a roaring success—and an early indicator of what was yet to come in the world of digital signage.

The Next Phase

At the same time Ford was rolling out the first motorcar[1], other industries were taking advantage of signs on the sides of buildings and in newspapers to share their products with the world. Billed as sharing “goods on hand”[2] with consumers, they often appeared in the back of magazines or as a very narrow sidebar in newspapers.

As the early 1900’s rolled into the mid-1900’s, ad agencies began to focus on the psychology of why people buy[3] as they created hand-drawn advertisements for the back of magazines like Vogue or Harper’s Bazaar[4].

Ad men learned quickly that hitting a consumer’s “pain points”[5] was key, and advertising took off like a shot.

Speaking of shooting, remember the hand drawn ad that Ralphie from the movie “A Christmas Story” so admired? It was for the Red Rider BB gun. He tucked it into the back of his mother’s “Look” Magazine so she would be convinced it was the perfect gift for a young boy.

That ad hit his pain point for sure, because without it, he couldn’t kill the imaginary bears lurking behind Pulaski’s candy store.

Before long, photography overtook hand drawn ads. Soon thereafter, TV and radio showed up, with the first radio ad airing in 1922, bringing advertising into a completely different space and reaching millions more than magazines or newspapers ever could.

And not long after, the origins of the Internet were quietly born.

Dubbing it the Galactic Network, computer scientist J.C.R. Licklider wrote about a concept he envisioned where computers were interconnected globally and data could be shared. The year was 1962[6].

Digital Signage is Born

As television grew in popularity and technology boomed, hardware like the VCR was born. People went wild. Not only did the clunky machines allow us to see a favorite movie over and over again, it was also the first indication that video could be produced, stored, and played back for promotional purposes.
To clarify, a VCR connected to a screen for promotion is not digital signage. As I said before, digital signage is, specifically, a display run from some type of media player. But I mention this evolution because it was the precursor to what became digital signage.

The retail industry first took advantage of the "produce and play information again and again" idea.

By the 1970's, retailers were using the now-ancient machines to play commercials or advertisements in-house for customers to see as they meandered through the store looking for good buys.

One of the very first industries to recognize the potential for this sort of video-based signage was the fashion industry. That makes sense, of course—fashion is all about looking forward to the next big thing.

Way back in the late 70's, fashion houses recorded their runway shows and printed them to VHS. The tapes were then delivered to the retailers that sold the fashion label's clothes and played on the TVs to tempt customers with visions of refinement and swooshy fabric.

Video-based signage took another step forward with the advent of the LaserDisc. This format arrived on the market in 1978. With an analog video format, it offered quality advantages over VHS tapes.

The high cost of the players kept LaserDiscs from being being a hit with American families—but they had niche use in certain commercial applications.

The video wall, a form of digital signage using multiple tiled and coordinated displays, came into use in the 1980s. However, splitting the video signal to multiple displays required computer processors—which, in those early days of computing, were prohibitively expensive.

As a workaround, some businesses used separate, synchronized LaserDisc players and specially prepared content for each screen. This technique produced good results but was never widely used.

Another step forward came with DVDs, the first commercially available and fully digital video format. Co-developed by several prominent electronics corporations, it made its market debut in 1995, long after the death of the LaserDisc.

It met rapid success, given superior image quality to the VHS. They were a hit with retailers as well.

Many abandoned their analog video signs and switched over to DVD players.

It was when the Internet really exploded in the 1990's that the concept of broadcasting on a larger footprint outside of a store or business started to turn in the minds of techno-geeks and advertisers everywhere.

From here, an even bigger idea was born: Use video, commercial displays, and players to spread advertising and messaging everywhere via the Internet. Those that utilized the technological concept, they realized, shall reap great financial rewards.

Digital Signage Grows Up

The term 'digital signage' was born in early 1992 in a UK shopping center. Apparently a security guard didn’t know what the network of video walls he was looking at was called, so he referred to them as digital signage. From there, it is alleged that Neil Longuet-Higgins from SIS Digital was the first to use the term.

I can’t help but think that security guard is kicking himself for not trademarking the name.

But as it goes with any technological development, there are many players, some of whom participated in the creation of the hardware, others who participated in the creation of the software, and a few security guards here and there that were busy unintentionally coining phrases.
Modern Digital Signage

Tracing the Components

Digital signage relies on different pieces of hardware to deliver content. Typically they are the display screen and the media player (what the VCR in the 70’s acted as).

The content is created with software, often referred to as a Content Management System, or CMS.

Screens

Of course, in the early days, retailers had to hook up their VCR to a clunky CRT (cathode ray tube) screen. These were staticky, had reflective and glare-prone screens, and—as anyone who’s had to haul one upstairs to an apartment could tell you—tremendously heavy.

CRT screens have their roots way back in 1869, when scientist Johann Hittorf noticed that rays from a negative electrode seemed to be travelling in a straight line down a tube. Later, other scientists realized that these rays—streams of electrons—could be bent using electrical or magnetic fields.

But it wasn’t until 1907, when Boris Rosing used a CRT to create simple geometric shapes on a phosphor-coated screen, that the full implications of the technology were realized. 1907 marked the invention of television, and by 1934 German company Telefunken was selling the first commercially made TV sets.

In the 90’s, the Japanese company Fujitsu brought the first commercial plasma displays [18] to the market. By 1997, they were selling at $13,000 for a 42” display.

While tremendously expensive, the large sizes of these screens—much larger and lighter than any CRT could be made—sent ripples through the budding digital signage industry.

Talk about eye-catching!

Today, anyone using digital signage to market their product or business typically uses one of these hardware screen displays:

- **LCD** (liquid crystal display), which, put simply, involves a layer of liquid crystals sandwiched between two polarizing filters. An electric current aligns the crystals so that light either can or can’t pass through at each given point.

- **LED** (light-emitting diode), which involve an array of semiconductors that emit light when a current passes through. They may be used as backlighting for a LCD display—but still, confusingly, referred to as LED screens—or by themselves. Think jumbotrons at sporting events. But recently the trend has been to use LED in an indoor setting.

- **OLED** (Organic light-emitting diode), containing thin flexible sheets of an organic electroluminescent material, used for visual displays. An OLED display works without a backlight; thus, it can display deep black levels and can be thinner and lighter than a liquid crystal display (LCD).

- **Indoor, semi–outdoor, and outdoor screens** are very different from one another, each with special technology specific to its intended environment. Indoor screens might have dust-repellent encasing, scratch-proof, heavy duty, able to be on 24/7, cooling system, and more. A semi–outdoor screen is indoors, but still exposed to direct/indirect sunlight. The LED semi outdoor screens usually produce less light because there’s natural light in the room. Outdoor screens have special casing and specifications on how much light is omitted so you can still read it in direct sunlight (and continues working in extreme heat, cold, wind, etc...)

In some cases, projectors, consumer TVs, and even plasma screens are used.

We’ll talk much more about hardware in Chapter 5.

Interestingly, the development of the LED and LCD happened in the same year: 1962.

Well, sort of.
The LED screen[20] came about thanks to the invention of the LED light bulb by scientist Nick Holonyak, Jr. in 1962. These screens emit images using several small diodes. When you look at a digital clock, you’re looking at LED lights.

The LCD screen has origins dating back as far as 1888, but the development of the actual screen started with an RCA researcher named Richard Williams[21]. Williams discovered that liquid crystals exhibited some interesting electro-optic characteristics. Unfortunately, Williams doesn’t often get credited for his scientific work with LCD, thanks to a man named George H. Heilmeier.

George H. Heilmeier[21], PhD, ended up in the National Inventors Hall of Fame and was credited with inventing the LCD screen. While Williams originally discovered what the liquid crystals could do, Heilmeier claimed he “stumbled” upon the same discovery in 1964. At any rate, it was Heilmeier who developed the first working LCD screen in 1968.

Media Players
Media players were born when computers[22] were born, essentially. Media players were originally full-sized computers, and usually were hidden under an entire station casing so you’d only see the screen.

Today media players are much smaller and more compact.

The job of the media player is to power the content displayed on your screen. So again, think VCR. These media players talk to servers, which direct your content via the Internet.

The early media players were very bulky. The first kiosks looked like telephone booths or caskets, because the processor was a full-scale computer hidden under the screen.

Later on, these "brains" shrunk down to media players, about 5 by 7 inches—devices such as the Chromebox—which could sit next to or hide behind the screens.

These are still a very popular option.

There are other digital signage options for an “all-in-one” screen, which was a big trend a few years ago. With an all-in-one digital signage solution, the compact media player is mounted behind the screen or often within the casing.

However, this sometimes makes the screen thick and bulky, which isn’t aesthetically pleasing, and in recent years chip technology has entered the marketplace.

Software
While we’ll be going into more depth on CMS in Chapter 6, a brief rundown would probably help you here.

You can categorize content management systems in two buckets, if you will:

- A Cloud-Based Content Management System, commonly referred to as “on-prem” or “on-premise”

Here’s the difference:

1. A Cloud Based Content Management System is software that delivers your content to remote players (like kiosks or interactive displays) via the Internet from an off-site server. The information is stored on these off-site servers, and streams your content to each remote player, no matter how many you have.

2. A Hosted Content Management System also delivers content to remote players (like kiosks or touchscreens) via the Internet, only it’s delivered from an on-site server that is hosted and maintained by your company. This delivery isn’t able to stream your content to several remote players, unless they are fairly close to your on-site server, and scalability is typically more costly.

As far as digital signage software, it’s hard to say when the first piece was created. But once the phenomenon of networking media players to screens in various locations began to take off in the 70’s, the software wasn’t far behind.

Today there are many digital signage software choices, all of them catering specifically to the niche requirements of the company and the needs of the end user.

At the very beginning, digital signage software was developed individually, for each installation, and hosted on-premise.
Software companies verticalized quickly, driven by industry changes. For example, schools want digital signage that can double as an emergency alert system, and quick serve restaurant chains (QSR) want digital menu boards that will let them update content quickly and comply with FDA requirements.

Early on, digital signage software companies also positioned themselves as resellers for hardware. With digital signage, software isn’t the whole picture of the solution: you need the commercial display, wall mount or stand, media player, cables, and any other specific items.

Over time, though, many realized that the profit margin for selling software (80 to 100 percent) was much higher than the margin for hardware. In 2015, for the first time in digital signage history, more money was being spent on software than on hardware.

There has also been an onset of Freeware, which puts the CMS out there quickly with fee-based services on the backend, however these solutions are not designed to meet the needs of most enterprise businesses.

Where We Are Today: Old vs. New Uses

Today it seems that if a business or organization isn’t using digital signage, they are behind the times.

While this isn’t necessarily true, what is true is that more and more industries are using the technology to share their message with the world. And see the consumerization of technology and its integration into their everyday business as just a cost of doing business to retain customers.

Early Uses

During its early days, digital signage and pre–digital video signage served many of the same purposes that that already–existing technologies did.

One of the first verticals to take advantage of digital signage was the retail industry, which to this day holds the largest market share despite growth in many other verticals.

Among the early adopters was Loblaw’s, a Canadian grocery chain. Their video–based signage system made its first appearance in 1984. They set up Sony TVs in their retail locations to play ads for the shoppers, but they also used the screens in back of house applications.

They were able to play training videos and display regulations to encourage compliance.

Of course this wasn’t digital signage as we would define it today, but a hobbled–together solution to engage their customers.

Another early use was within the transportation industry. Some of you reading like this might recall, with nostalgic familiarity, the click–clack of split–flap arrival and departure boards at train stations or airports.

In 2015, for the first time in digital signage history, more money was being spent on software than on hardware.
Chapter 1: History of Digital Signage

First introduced in 1950’s[^24], some of those displays are still in use today. However, split-flap signs are prone to jamming and breakage. Digital signage proved a welcome innovation. First, split-flap boards were replaced with CRT displays, and later, these burnout-prone screens were swapped again with efficient LED arrays.

As for true digital signage, with multiple networked screens, one of the early large installations occurred in 1999. Over 100 plasma screens went up in a casino at Mandalay Bay in Las Vegas[^10].

These screens were shockingly modern in their use. Not only did they advertise, they engaged gamblers (their target audience) with constantly updating messaging designed to encourage more gambling.

The screens specified which machines had large jackpots on the line, among other things.

Again, early digital signage still wasn’t widespread. There were relatively few providers, and relatively few verticals interested in investing.

Overall, the theme of early digital signage was providing information. Ads, departure times, jackpot values… The information was simply there, on display, but without much customization or targeting.

At the time, that was revolutionary enough, but as time passed, consumers began to expect more.

**Modern Uses**

Though, as we’ve seen, digital signage has deep roots, the industry didn’t really take off until much more recently. Perhaps only in the last six years[^14].

By “take off” we mean market penetration. Of course the technology has been around longer than six years, but the market penetration wasn’t keeping up with the digital signage industry’s appetite to innovate.

Innovation was faster than customer adoption.

The digital signage industry reached a tipping point in 2010 or 2011. DisplaySearch is a company that tracks various sectors of the display or screen market. Since ‘screens’ is such a broad term that includes cell phones, TV’s, computer screens: desktop, laptop, etc… the digital signage screen opportunity always looked like such a small opportunity when compared to other displays.

And it wasn’t until the commercial digital signage adoption was around 5 percent in the display market that the OEMs took notice.

Then major hardware manufacturers sensed that digital signage could be a valuable source of revenue and began making their own CMS to ignite further growth within the industry.

Other contributing factors were price and internet access.

With the prices of LCD and plasma technology coming down, it’s safe to say that yet another chapter in the history of digital signage is being written. Historically, the barrier to entry was pretty big for a lot of industries. The digital signage technology advanced beyond market penetration in the early to mid 2000’s, so the majority of companies using it were considered early adopters.

But now, prices for hardware and software have lowered drastically, making it an option for many companies.

Since its early days, there’s been a huge expansion in the types of places you might discover digital signage.

Outdoor signage is bigger than ever. Now with outdoor-grade screens for better viewing, vandal-proof glass, and waterproof options for large screens, we’re seeing more and more digital pop up outside in LED and OLED. Sometimes with billboards, other times at stadiums, amusement parks, and public places.

[^10]: http://example.com
[^24]: http://example.com
Nonetheless, it’s there. The possibilities are endless. Small businesses use digital signage in their brick and mortar establishments to share promotions and sales. Some go above and beyond and take advantage of the Internet to broadcast their sales in various stores.

Quick serve restaurants use digital signage to up sell products and make ordering easier. By using digital menus that show video of a refreshing drink or sizzling burger, restaurateurs can sway a thirsty or hungry customer to buy more.

They also make ordering easier with self-service kiosks at tables or that stand alone.

As that last example indicates, digital signage has spread beyond simply offering information. Today, the focus is increasingly on interactivity and engagement. Since about 2013, there has also been a focus on interoperability of devices and integration of content platforms; that is, what’s been termed as the Omnichannel: having multiple types of screens, from tablets to video walls to cell phones, work together to tell a unified “story.”

Think about the example we offered at the beginning of the article about the digital denim kiosk.

It’s all about empowering the customer with the information they want to see. It’s about building a relationship between the customer and the brand—because digital signage is a truly powerful branding tool.

Remember that Canadian supermarket we mentioned earlier? Today, Loblaw is still experimenting in forward-thinking digital signage with the Concierge smart cart system. It’s both a service and an experience, and it’s enabled by digital signage.

Here’s how it works.

Shoppers can prep shopping lists and make deli orders in advance on the retailer’s website. When the shopper arrives at the store, he grabs a cart and swipes his card next to the built-in screen. Up pops his shopping list—along with GPS-style directions to find each item.

It’ll notify him when he reaches each item, and when he walks past a sale.

Because the system has access to his loyalty card data, it can automatically offer him deals based on items he frequently purchases. There are also kiosks in various areas of the store that offer detailed product information and suggest recipes, which you can send to your phone or save to your account.

The system is fully integrated with existing programs, interactive, comprehensive (including multiple screens: on the cart, on the kiosks, and on the customer’s phone), and highly personalized. And that’s the direction digital signage is moving today.

None of these options would have come to fruition without the movers and the shakers we talked about. All of it adds to the rich history of one of the most profound technological advancements we’ve seen to date.

So what’s next?

With the onset of born-in-the-cloud software development and increasing IoT integration with digital signage means limitless possibilities.
Chapter 1: History of Digital Signage

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5 EXAMPLES OF HOW
The Biggest Brands
Use Digital Signage
in Awesome Ways

1. **Rebecca Minkoff**
   How tech in Rebecca Minkoff’s fitting rooms tripled expected clothing sales. 
   Read the full story here.

2. **Burberry**
   For their London-based Regent street store, Burberry created their most technologically advanced store yet with 100 digital displays, 500 speakers, and the world’s tallest retail indoor screen. Read the full story here.

3. **Nike**
   Nike created a unique experience for their London shoppers with what they call Fuel Station. The completely interactive store is like nothing else, and engages shopper in creative ways. Read the full story here.

4. **Audi**
   Although Audi isn’t in the retail industry as most of these examples are, one of their stores is very similar to a retailer. They only have one car at the dealership. You read that right. One car. The rest of the experience is an entirely digital experience. Read the full story here.

5. **Tesco**
   The retailer tapped into the multi-channel buying habits of their target demographics by installing "magic mirrors” to try on clothing with interactive kiosks. Read the full story here.
Digital Signage Guide

10 Digital Signage Topics You Need to Know Before Buying

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Digital Signage Benefits

When I was a kid, I always hoped I would see one of those billboard guys rolling a new sign onto a billboard as we whizzed down the highway. It fascinated me, the way two or three men rolled a brightly colored advertisement into place for all the world to see.

As I drive down the highway today, I still see those billboards, only they don’t require those men with the tools to unroll and glue them.

One by one, digital billboards are replacing static boards.

And that’s not the only place paper advertising is being replaced by digital signage.

Thousands of brick and mortar stores are ditching their posters and POS banners for the new technology.

It sounds cool, but does it actually make sense for your business?

Before you decide, you want to see exactly how digital signage can benefit your business, and if it’s actually better than traditional signage.

You want to be sure there’s a way to quantify digital signage’s results, so you can measure whether or not it’s a good investment.

Those concerns are valid.

We’re going to answer those questions, and then some. We want you to have the scoop so you can make the right decisions and invest in products that work best for you and your company.

In this chapter, we’ll show you how to measure the benefits of digital vs. traditional print signage and the ROI of digital signage.

I put together a framework for how to track your digital signage ROI. The PDF outlines — step-by-step — exactly what key performance indicators matter to track your ROI... you can bookmark, print out, or keep it in a folder for reference. Get your PDF here.

Print Signage Vs. Digital Signage

It’s the digital age.

Some companies realize that and are on the frontline of technological innovation. Other companies don’t want to transition until it’s a proven method that brings them more business.

I’m going to use retail as an example here. Many of the benefits are also applicable to other industries, so keep an open mind.

Here are five reasons why retailers should switch from print to digital.

1. Increase Customer Engagement

Human psychology says that we have six human needs we must fulfill in order to feel whole.

One of those needs is variety: the need for the unknown.

We crave change and unique experiences. We need new stimuli, and we need it regularly.
For many, digital signage is new stimuli. If you can engage and stimulate your audience with something powerful, you’re on to something.

Digital signage makes an impression\textsuperscript{[28]}. Of the 70 percent of Americans who recall seeing a digital video display in the past month, 47 percent specifically recall the ad that they saw.

That’s really high, especially since it’s over the last 30 days!

People are more likely to pay attention to colorful, moving images rather than static images.

While pretty posters are nice, moving images that elicit emotion are even better. When you can elicit an emotional response that connects with your customer, you engage with them. (Keep in mind that your digital signage goals might be various things like: educate, inform, entertain, engage, convert, or sell).

2. Make Good—and Numerous—Impressions

One study used anonymous video analytics to log the number of people who noticed both static and digital signs at multiple locations.

The number of impressions (people who walked by / looked at it) logged by the static sign peaked when it was first put up on its first day. After that, the impressions dropped off and remained low for the remaining weeks of the study.

But the digital signs received consistently high numbers of impressions throughout the study—receiving almost as many every day\textsuperscript{[28]} as the static sign received the first day.

This suggests that while it’s easy to look past a sign that just sits there after the first time you’ve seen it.

It’s hard to ignore even a familiar digital sign.

No surprise there: Digital signs allows for constant change in the environment with audio, video, live news and social media streams, and more.

There’s no reason to leave the same content up for too long.

Users can update content remotely and their store, even 1,000 miles away, will see the updates within seconds.

Retailers consider this a huge benefit that saves time, hours, and employee manpower.

By updating pricing, promotions, and adding specials to create an upsell feature, fast casual chains can adjust to customer demand without deploying employees or having new signs printed. It also makes dayparting menus super simple.

3. Digital Signage Can Grow Sales by 12 percent

“You must spend money to make money.”\textsuperscript{[28]}

Roman playwright Plautus\textsuperscript{[29]} said that during his writing career before he died in 184 B.C.

Centuries later, his words are infamous on the lips of business coaches and fiduciaries\textsuperscript{[30]}. Without financial risk, there is no reward.

This philosophy, coupled with the testaments of financial gain by businesses and organizations everywhere, proves that the leap to digital signage is only a danger to those who fear genuine growth in the digital age.

Let’s take an example from the food service industry: Taco John’s. In 2014, they made the decision to deploy digital menu boards.

Seven months into the deployment, they saw a 12 percent increase in sales.

Based on these results, they decided to add menu boards to 100 more locations. They were such a hit that Taco John’s made the decision to upgrade the rest of their restaurants through 2016.

What’s behind that success? Here are several real, relevant stats.
Chapter 2: Digital Signage Benefits & ROI

a) Digital signage drives impulse buys.
Have you ever caught sight of an advertisement and suddenly realized that you had, for example, been craving a KitKat bar all day?

Then you've joined the 19 percent of consumers who claim to have made unplanned purchases[28] of products they've seen advertised digitally.

And that's only consumers who admit they've been swayed. We all know the real numbers are much, much higher -- probably closer to 5 in 6 Americans make impulse purchases[42].

b) It's a great way to promote specific items.
One study advertised certain food items at different locations where those items were sold, some of which had static signage and some digital.

The items advertised with digital signs experienced, on average, a 49 percent increase in sales versus a control period where there was no advertising.

Those advertised with static signs only had a 15 percent increase in sales.

In other words, in this case, digital signs were 34 percent more effective[28] in promoting specific items than traditional signs were!

c) Digital signage motivates customers to action.
In the study mentioned above, static signs and digital ads were posted that prompted customers to go to the help desk and receive a free tote bag. One location received static signs; two had digital. Each location received similar numbers foot traffic to advertise to.

During the entire experiment, only 6 people took up the offer in the location with the static sign.

But a combined total of 610 people grabbed totes in the locations with digital signs.

4. Leverage Targeted Advertisement
Your signs don't all have to display the same content.

You can change the ad depending on the time of day or location of the screen.

For example, let's say that a library has recently installed digital signage. There are five different screens: at the entrance, the children's section, the main check-out desk, the computer area, and the coffee shop in the basement.

Some ads might go on all the screens, like if there's a holiday coming up and the library will be closed.

But some ads will only go on a few screens. The screen in the children's department might advertise kids' programs while the screen in the coffee shop might share about an upcoming music night.

With digital signage, your information can go directly to its intended audience for maximum impact.

5. Gain Long-Term Savings
The reason so many of us resist buying a big ticket item is, well, because it's a big ticket item. We fear it costs more than we're prepared to spend.

Many of us don't realize that the upfront cost of digital signage is often the same as what we spend on paper and poster marketing all year long!

For example, consider what it costs annually to:

- have campaigns printed and distributed.
- employ staff to design, create, and distribute those signs.
- employ the same staff to redesign, recreate, and redistribute those new, updated signs.

What's more, digital signage campaigns have a higher Return on Investment (ROI) than traditional campaigns.

We've seen time and time again that sales increase when digital signage is at the forefront of a sales funnel, especially when creative video plays a role.
When we can stare at a statistic that tells us anywhere from 65–85 percent of consumers are more likely to buy after watching a product video, investing in a digital signage campaign sounds pretty tempting.

The digital marketing format yields long-term savings, brings interest to your retail store, and gives you an ROI that makes moving into the Digital Age a really comfortable ride.

**What’s Digital Signage Worth to You: ROI and ROO**

You just finished reading some of the stats on how digital signage can benefit your business. They sure sound tempting! Let’s throw in one more for good measure.

One study found that 83 percent of small business owners who had invested in LED signs believed that their sales increased afterwards, and 86 percent said they thought the signs brought in new customers.

However, that same study cautions that dollars spent in advertising may take weeks or months to pay off (or not), and that many factors may be at play.

How, then, do you measure whether or not the digital signage you’ve installed is actually benefiting you and your business?

Can you get hard numbers instead of just a gut feeling?

Yes, you can.

By using Return on Investment (ROI) or Return on Objective (ROO).

**What’s the Difference?**

ROI is common. But I’ll define it anyways.

It’s what’s known as a “profitability ratio,” or a way of calculating how profitable an investment you’ve made is. It measures the results (usually monetary, like increased sales) of an investment (such as installing digital signage) as a percentage of the original investment.

ROO is, essentially, a broader version of ROI.

This term has gained popularity with digital signage professionals, because as we’ll discuss later, it can be difficult to directly measure the ROI of digital signage.

ROO involves setting a goal for what you want to get from an investment and then measuring how well those goals are met. The goals could be anything from increasing brand visibility to enhancing order accuracy at your restaurant.

Before we get into the nitty-gritty of how ROO and ROI work, perhaps you’d like a couple of examples.

The QSR industry is rich with examples of successful digital signage implementation—and it shows how different corporations can have different definitions of “success.”

**Digital Menu Boards**

If you’ve grabbed a bite at Wendy’s, McDonald’s, Taco John’s, or a number of others recently, you may have noticed a digital menu board (DMB) behind the counter.

Seeing footage of shredded cheese showering a taco or a toasted bun falling into place always makes me a little hungrier.

What could ROO and ROI look like in the context of DMBs?

**ROO**

**Readability:** Often, ROO focuses on customer satisfaction.

Seventy-four percent of customers say that an easy-to-read menu is a top priority. A bright, colorful, well-designed menu is highly readable, and by cycling through multiple screens it can display its information at a larger font size.

You could evaluate your objective of increasing readability by orally surveying customers about how easy to read your menu was before and after installing DMBs.

**Regulation conformity:** Sometimes, your objective is to meet federal requirements.
Recent laws require restaurants with more than 20 locations to display calorie information next to each item. Many restaurants also choose to list potential allergens such as gluten or nuts, and whether the items are vegan and/or vegetarian friendly.

Traditional menu boards just don’t have room to list all that information at readable size—but a digital menu does. Digital menu boards can cycle through multiple screens and switch information out easily.

If that’s your objective, your return would simply be seeing that your DMBs could fit the required information more easily than your old traditional menus.

**ROI**

**Sales:** ROI usually focuses on sales.

It can be difficult to assess whether installing a digital sign has a direct effect on your sales. However, it’s still possible to evaluate, as we’ll explain below.

Studies show that installing a digital menu board can boost overall sales by 3 to 5 percent and much higher on specific promoted items.

Digital signage is great for prompting unplanned purchases, and that holds true for DMBs.

Thirty percent of customers report that digital signage menus influence which product they purchase.

Also, digital menus give restaurants the ability to create promotions and offer upsells that rotate regularly, giving the establishment opportunity to generate more money at specific times.

**Foot traffic:** DMBs also drive foot traffic, particularly at locations like malls and airports where they can catch eyes of passers-by: 15 percent of restaurants report an increase in number of customers after installing a digital menu. And this, in turn, increases sales.

This is something you could track yourself, if you compared the average number of customers you received in an hour or day before and after your DMB’s installation.

**A Simple Method for Finding ROO**

Measuring ROO has become the industry standard in digital signage, because often the goals people have when they install digital signage aren’t purely or primarily monetary.

Is it possible to do without commissioning a study?

In fact, yes! Below, you’ll find a three-step process for designing a method of tracking ROO, along with a handful of specific strategies to get you started.

**Step 1: Decide what constitutes ROO for you**

Before you invest in a digital signage system, you should have a clear picture of your goals.

Do you want to increase customer satisfaction by introducing queue management techniques via digital signs, in hopes of shortening their perceived wait time?

Are you hoping to promote specific sales or special offers?

Maybe you’re planning on integrating digital signage with beacon technology, so that the approach of a customer with the right app installed on their phone would trigger a targeted message on-screen, increasing customer engagement.

Whatever the case, your goals will determine what aspect of ROO you’ll want to focus on.

After all, ROO doesn’t have to be monetary. It can be more abstract (though still quantifiable) as well.

If happier customers are your goal, then you wouldn’t look for an increase in sales—you’d, perhaps measure how long customers wait in line, and lessen decision fatigue by using a digital promotion board.

When everyone makes up their mind faster, no one has to wait as long.

This would actually kill two birds. If you cut down on wait time, there would be less people leaving for a place across the street.
Or you could be focusing on increasing your visibility. If that was the case, perhaps you’d be more interested in looking at whether your social media presence increased after installing the system.

Here’s what comes next.

Whatever metric you decide on, set a numerical goal: for example, a 30 percent decrease in perceived wait time within the first month of installing your screens at the checkout line.

You want a concrete way of determining if the digital signage system is worth it.

Step 2: Get tracking!

After you determine your goals, you can develop a strategy for determining ROI. Here’s five strategies to give you some ideas.

1. Social media
   As mentioned above, if your goal is increased visibility and generating conversations, one great way to track that is by using social media. There are many, many tools for pulling statistics from platforms such as Twitter and Facebook.

   Likewise, there’s many ways you could use a digital signage system to enhance your visibility on social media.

   Perhaps your store has its own hashtag, which your customers can use on Twitter. After installing your digital signage system, you can watch for an increase in use of that hashtag.

You could program the screens to display a message prompting customers to Tweet about a certain topic, showing some of their responses on the screens in-store. You can have a drawing to send a coupon or a prize to someone if they use your hashtag.

   Customers love the chance to interact and be heard, and you get a publicity boost in the process.

2. Track customer impressions through prompted actions
   If you’re hoping to measure ROI in terms of customer impressions, you’ll need a way to track that.

   While you could simply look at foot traffic through your store, that doesn’t reveal whether or not customers noticed the signs, and more importantly whether the signs prompted them to action.

   The above-mentioned social media prompts could be one way to measure that, but not everyone is willing to use their personal feed to promote a business.

   Instead, consider promoting a giveaway and measuring impressions based on the number of customers taking advantage.

   You don’t need to break the bank.

   An example is using a digital sign to instruct users how to digital download a coupon or enter a drawing, making them more likely to spend while in your store.

   Track the number of coupons taken to determine how many meaningful impressions you’re making.

3. Feedback (from customers and employees)
   Feedback falls into the more abstract category of ROI, but it’s still valuable—especially when the numbers are proving difficult to interpret.

   Do your customers find the signs flashy and distracting, rather than eye-catching and appealing?

   Do they remember what they read on the signs?

   Do they habitually check the displays for today’s promotions and deals?

   And what do your employees think? Have they noticed customers looking at the signs? Do they feel they enhance the store’s ambiance?

   You won’t know until you ask.

   While conducting surveys can be time-consuming, the data yielded is invaluable. It can be a chance to collect demographics information as well.

   Perhaps you’ll find millennials like the signs most, or that middle-aged women remember to check for deals most often. This information will help you tweak the signs’ content.
Step 3: Tweak content to maximize ROO

Once you’re armed with the demographic information and feedback you’ve collected in the process of determining ROO, you can use that information to maximize your ROO.

If you’re finding that millennials are paying the most attention to your signs, you can target content towards them.

If your older shoppers think the words are too small to read, you can increase font size.

It turns into a feedback loop: **determining ROO enhances your ability to increase ROO.**

Can You Calculate Your ROI?

That sums up ROO. Those of you who prefer to measure success in terms of hard dollars may be wondering, what about ROI? Like I’ve said, it can be hard to calculate the ROI of digital signage.

Here’s why:

- Businesses rarely track the ROI of traditional paper signage. That means you won’t have any way to compare your data to after installing your digital signage. Studies have shown that much of traditional paper-based signage never gets installed or isn’t installed during the proposed promotional period.

- Many factors may be at play besides the introduction of your menu board. How will you control for changes in the economy and seasonal highs and lows?

Is it possible to do?

Yes, it is.

Here’s a few commonly used key metrics for finding ROI (and you can download this matrix as a PDF to reference later).

**Key Performance Indicators for ROI**

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Chapter 2: Digital Signage Benefits & ROI

However, to get the best possible picture, you’ll need to do a side-by-side test, using historical sales data. How it works:

Choose three to five of your chain’s stores. If they’re similar in terms of annual profit and foot traffic, that will be one less thing to control for. You should have sales data from former years on hand.

After installing digital signage in some (but not all) of those stores, continue tracking sales data.

For each store, compare year over year sales\(^{36}\) (to mitigate the data-skewing effect of seasonality). For the stores that installed digital signage, compare before-and-after data.

Then compare the stores to each other, taking into account as many outside factors as you can: the economy, the stores’ locations, other changes at the store like remodelling...

Whew! Sounds like a lot of work, right? We have some advice to help you along.

When you’re carrying out these comparisons, you’ll also need to be able to measure both the investment and the returns of your digital signage. (Depending on if you are paying for the initial hardware investment out of CapX (and depreciation) or OpX you will need to adjust your ROI model to compare apples to apples.)

You’ll need to consider three things\(^{37}\):

- **Total Revenue:** Cash generated.
- **Gross Profit:** Revenue minus cost.
- **Net Profit:** Gross minus expenses.

To measure these three elements, you’ve got to ask yourself some key questions.

Here’s why. They’ll not only help you determine your ROI in the first months as a digital signage owner, but will also continue to lead you in the right direction as things change in your industry.

Let’s dig into those key questions so that by the time you’re done reading, you feel more confident with your direction.

3 Questions to Ask About ROI

1. **What Do You Need?**
   After deciding what purpose you want your digital signage to serve (which should be your first step, before you even think about investing), your next step in finding your ROI should be determining what software and hardware you need for your digital signage campaign.

   For example, many restaurants now use digital menus or self-service kiosks. The kiosks can replace paid workers\(^{33}\), reducing payroll and insurance costs.

   Schools or other institutions often use digital signage for wayfinding purposes. Interactive maps can minimize costs related to the printing of traditional maps and signs.

   This alone can reduce employee time\(^{38}\) dedicated to creating those products, as well as the time spent providing direction assistance.

   In remote conference rooms, they replace workers who would otherwise spend hours training new employees on basic policies or new concepts.

2. **Does Total Cost of Ownership Play a Role?**
   The estimation of expenses associated with purchasing, launching, and using the signage should be taken into account. This is called **Total Cost Ownership** (TCO), and it can vary, based on your needs.

   Consider how you would use digital signage to enhance revenue, engage customers, and overall improve the movement of your business.

   By determining what you need, you can then determine the best digital signage campaign for your business.

For the most part, digital signage should be looked at as a long-term investment, which is why TCO is important to consider when measuring ROI.
This is most often a point of resistance for potential sign owners, as they want an immediate return on investment. Nonetheless, a new digital sign owner should track how long the technology has been owned before it has paid for itself. New sign owners must also consider the number of man hours spared without an employee or two writing, printing, and sending out updated posters and other disposable signage.

When looking at TCO on digital signage be sure to look at all costs. Freeware is very common right now but usually comes with limited functionality and/or fee-based cloud storage and services, and traditional on-premise signage comes with higher scaling costs to maintain and expand network servers.

With a digital signage network, sales, price changes, and specials can be updated with real-time information, saving thousands of dollars on printing costs and plenty of manpower hours each month.

3. Will ROI Improve my Brand Perception?
Lastly, but certainly not least, enhancing your brand perception can help generate a broader sense of who you are, ultimately bringing more people to you.

Digital signage can provide a platform for your business to help you achieve this. When more people become aware of who you are and what you do, more people will buy.

How’s that for simple analytics?

Because the signs can be changed at the drop of a dime, your brand content can be customized to suit a target demographic.

By doing this, your brand can reach different people at different times, churning sales that may not have been able to happen before with standard, traditional poster advertising.

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# Key Performance Indicators for ROI

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10 Biggest Digital Signage Challenges

Digital signage has the potential to produce some undeniably cool customer experiences.

And while it’s entirely possible to get good results on a budget, looking at what companies with apparently limitless budgets can do is often what fires people up.

For example, take a peek at Under Armour’s gorgeous Chicago Brand House[^2], which is a true testament to how bold and futuristic digital signage can make a space look.

They installed no less than five distinct digital signage elements, from interactive kiosks to beacon-integrated stations, to wraparound video walls.

Perhaps one of the most visually arresting elements is the massive five-sided LED cube suspended from the ceiling. Its edges are nearly seamless, and it has 706 square feet of space to play Under Armour’s ads.

And then there’s the kiosks that use light sensors to measure how high customers jump, and then email them their record—which meshes super well with Under Armour’s fitness-centric brand.

Feeling inspired yet?

Many business owners are in a similar situation.

After reading about the many benefits of digital signage and seeing some of the statistics about how it increases sales, businesses are eager to take advantage of the technology.

That’s good, but using digital signage in retail isn’t something you should rush into, especially if your budget isn’t limitless. (I’ll be using retail as an example in this chapter, just know that much of this is transferrable to other industries as well).

Rushing leads to more mistakes.

And mistakes make for higher costs and bad results.

Plus, barriers can come up that make it difficult to get the most out of your digital signage as a powerful communication tool. Digital signage successes like Under Armour’s Brand House can only exist because of meticulous, clearheaded planning. They couldn’t just hope for the best.

Under Armour had to anticipate and dodge many possible pitfalls.

When you’re implementing digital signage, you should do the same.

While it would be impossible to list every potential challenge, because they depend on your business, industry, goals, and many other factors, I’d like to give somewhere to start.

Consider this as a framework for considering the challenges that might arise with your own digital signage project, so you can create a plan of action to dodge them.

I boiled down this section into action-oriented steps you can take to address these 10 challenges.

The PDF walks through exactly how to approach each challenge. You can print it out or download it and keep it as a reference. Get your PDF here.
Take the Big 10 Digital Signage Challenge — And Learn How to Conquer Your Technology Fears

The first few challenges are centered around planning. They’re ones you’re likely to encounter while designing and installing your digital signage system.

1. An Unclear Vision

Digital signage is already a billion dollar industry, and is projected to continue growing at a rate of 11.2 percent YOY targeting $3.23 billion in 2020, and a 2014–20 CAGR of 13.2 percent.

Industry analysts still predict Retail will lead the charge with upwards of 50 percent of all digital displays going into this massive catch-all vertical.

Perhaps numbers can be ignored, but when your competitor right down the street installs a digital signage system, you might get scared they now has a competitive advantage over you.

Maybe you’ve seen a statistic like 42 percent of shoppers would prefer to shop at a store with video displays. The temptation is to rush and get a digital signage system installed as quickly as possible.

Hold up!

You see, much like any business strategy, it’s best to take the time and plan.

One of the first things you should ask yourself when considering a digital signage network is “Why do we need one?”

“To increase sales” is a decent start, but it’s not specific enough.

Imagine you’re a running equipment shop and installing your first digital signage.

If one project leader is focusing on enhancing brand identity and is pushing for content that is thematic, rather than advertising-focused (footage of local track meets), while another is focused solely on pushing product (all ads, all the time), you’ll have conflict.

Solve it!

Clarify what your vision for the project is first.

Your vision will help you choose everything from hardware, to software, to the content itself.

This will also help you determine how to measure ROO for your digital signage. Different goals lend themselves to different ROO-measuring strategies.

For example, if your goal is to increase your store’s exposure, you could track social media mentions.

Read Chapter 2 for tons of information about setting goals and calculating ROI and ROO for your digital signage efforts.

2. Fear of Spending

The cliché holds true: Sometimes you need to spend money to make money.

It can be a scary prospect, especially with technology and strategies as relatively new as using digital signage in the retail industry.

In fact, the temptation is to cut your costs as far as possible—in the hopes that if something goes wrong, if your plan fails to deliver, you’ll also cut your losses.

And of course, “spend money to make money” isn’t a justification for being fiscally irresponsible.

Solve it!

Perform a cost–benefit analysis to see if digital signage would be worth it for your business, and see what benefits it could bring to your company.

Make sure you only spend money where you need to. That is to say, while spending is necessary, overspending certainly isn’t.

Having a clear vision and plan for your digital signage will help you decide which features are needed and which are merely desirable.
For example, let’s look at digital wayfinding.

Advanced wayfinding systems can come with a laundry-list of special features, including…

◊ 2D and 3D maps of indoor and outdoor locations

◊ Dynamic route updates (Meaning if a class at a school changes places, or a sidewalk is being repaired, or—you get the idea—the routes suggested will change to compensate for those conditions)

◊ Ability to text directions to your smartphone

It’s hard to look at a place like Aventura Mall in Miami and not get a little envious. They recently deployed seven interactive digital directories. The 70-inch touch displays show an image of where you are now and where you want to be, plus detailed directions to help you get where you need to go.

Given the mall is 2.7 million square feet, it’s safe to say the wayfinding kiosks and directories were a good idea.

But in most cases, the goal of digital wayfinding is just to help someone get from Point A to Point B. That’s it: no bells and whistles required.

While it’s an added convenience for your customers, only the most dedicated of digital signage nerds would actually start shopping someplace just because they have really nice wayfinding kiosks.

If all your customers really need—or all you can afford—is a moderately sized touchscreen with a searchable directory and the ability to visually plot a route, that’s okay. There’s no need to break the bank!

Weigh the risk against the reward, the must-haves against the might-wants, and make a wise choice.

But sometimes, you need to be bold. Instead of looking solely at ROI or ROO, you should, when the time is right[^45], follow Under Armour’s lead and focus on creating an experience.

Take a risk. (And offset the risk with good planning!)

3. Poor Integration

These days, retailers expect their digital signage to be more than just digital versions of static signage[^46].

They need integration with multiple systems to be able to truly leverage all the customer data they gather (buying trends, weather, inventory, POS systems, loyalty programs, etc…)

They want to be able to use the screens for training and corporate communications after hours.

And for digital signage to be connected with the inventory system, so that specials can be offered based on what’s selling and what isn’t.

They also want the content to be coordinated with other marketing efforts online and on mobile.

Solve It!

Creating an omnichannel experience requires a lot of forethought and planning—we offer some advice here.

Make the Most of It

If you’re going to put the effort into fully integrating your digital signage, you’ll have a powerful tool in your hands. Don’t let it go to waste—come up with creative ways to maximize its utility, both for you and your customers.

Want an example?

If you plan on integrating your inventory system, don’t just use that to create promotions. Put that information in the hands of the customer, too. (Then cross sell and upsell your customer.)

When we shop for something we want and we find something we really like, it can be disheartening to discover our size is not available.

When this happens, we leave the store and seek what we want elsewhere.

Kohl’s[^47] has dodged this bullet by installing in-store kiosks that allow buyers to search inventory on the spot.

To make up for the fact that they might not have what you need on hand, they sweeten the deal by offering free shipping right to your door. This keeps the customer happy and makes them feel like they’re getting something extra.
Keep Your Customers’ Habits In Mind

Let's say you decide to tie together your loyalty program and your digital signage.

Kiosks located in the store could encourage customers to sign up for your loyalty programs in order to receive special discounts and news about sales.

Then, you could integrate beacon technology to deliver those deals directly to the customer's phone as they stroll around the store, or email them coupons or a newsletter to be used during online browsing.

You'd leave the choice up to the customer, so you could engage them using whatever channel with which they feel most comfortable.

Here’s the challenge, though: Kiosks can be expensive equipment depending on their complexity and enclosure, and beacons, while individually cheap, still take time and resources to set up properly.

You need a lot of customer participation to make the system pay for itself.

You’d need to convince customers to sign up for the loyalty program, and then download an app so they can receive alerts.

Think about it. While this project could be highly successful—after all, 81% of customers who receive a phone alert open it—it could also be an expensive flop.

It all depends on your customers’ willingness to participate, which you can evaluate in advance by considering their demographics and surveying them to assess their eagerness to buy in.

4. Not Enough Bandwidth

According to a recent study of major banks using digital signage (typically in retail banking), 16 percent had difficulties providing sufficient bandwidth for their systems.

In K-12, although internet is being added into many school districts, the bandwidth is less than that of an average home, but has as many as 200 students trying to connect simultaneously.

If you’re using the Internet or local VPN to stream your content, you may run into issues with your ISP, who often limit the amount of bandwidth each customer can use.

You might suddenly find your screens going blank because your ISP (Internet Service Provider) has cut you off.

That’s a problem you want to prevent in advance by knowing whether your current setup can provide for your needs, or whether you’ll need to make changes.

Solve it!

Larger files require more bandwidth to stream.

Standard resolution video takes about 40 MB/minute, whereas high resolution footage (1080i) requires a whopping 140 MB/minute.

You may wish to invest in a private leased line connection, which will allow you to monitor data flow and allocate bandwidth as necessary to high-demand links. This may also increase your data transfer rate, meaning smoother streaming.

Good news! If you’re using local playback, bandwidth will be less of an issue.

Local playback means that instead of the media player receiving a constant stream of content, the content is received only once and then cached on the media player for playback.

Depending on your CMS, you may be able to schedule these content downloads for off-hours when the demand for bandwidth is low. Most enterprise-level CMS will have this option.

5. Too Many Hardware Options

Here’s a fact: not all digital signage systems are made equal.

Different types of commercial displays play to particular strengths but might be weak in other ways.

Figure out your required bandwidth in advance, and get in contact with your ISP to see if your current plan can handle it.
If you make a poor decision, you may find that your customers can’t read the sign because it’s too small and too glare-prone. Or perhaps you purchased a consumer grade display and the screen you placed vertically as a menu board begins to deteriorate the image in the lower portion of the screen because it wasn’t meant to be used in that orientation.

**Solve it!**
Before installing digital signage, it’s imperative to research which of the many options are most suited to your needs and budget. Otherwise, you’ll be limiting yourself when it comes to using your network, or having to spend more money later to upgrade.

Also, make sure that the hardware and software you choose are complimentary and compatible with each other.

We’ll take an in-depth look at hardware in Chapter 5.

To get you started, here are some issues to consider for hardware, summed up from this article.

- **Size of screen:** Depending on where you want to put it, and what sort of content you wish to display, you might find a larger or smaller screen more suitable. You also have options in building out tiled walls or video walls from like sized or different sized displays.

- There are simple formulas[^50] for calculating what distance from the screen an image of a certain size will be legible at. Size will, of course, affect price, becoming a limiting factor in choosing what type of screen will work best.

- **Type of screen:** There are many options, ranging classic options like LCD and projection to fancy newcomers like OLED, ePaper, and indoor LED.

- Each has advantages and limitations in terms of size, price, what it’s best at displaying, and in what environment it’s most legible and eye-catching. It is important to know if the display is indoor, semi-outdoor (or near a window), or outdoor when selecting screen type. Make sure you have an idea of the possibilities available to you, because it may turn out that the best solution for you is an unconventional one.

- **Mounting:** Floor, wall, or ceiling-mounted? Your answer will vary depending on the space you’re in and whether you want the screens to be interactive. Take into considerations ADA requirements when installing touch screens, and consider antibacterial plastics for enclosures in public spaces, schools, and hospitals.

### 6. Confusing Content Management Software (CMS)

Difficulty in using CMS is among the top three complaints of digital signage users[^51].

Some CMSs are a confusing mess of endless menus, unintuitive commands, and jumbled windows.

Many of the people accessing your CMS (the content creators, the schedulers, and so on) aren’t necessarily tech-savvy. Their strength lies elsewhere. Your CMS should allow them to do their job without confusion.

**Solve it!**
Remember: The functions your CMS has should be defined by your vision for the digital signage.

These are the four questions you should ask yourself when choosing a CMS:

1. With whom do you want to communicate?
2. What message do you want to deliver? (And what action do you want your audience to take?)
3. Who is responsible for delivering this message, and what does success mean for them?
4. Where does the content/message reside today?

Practically speaking, the answers to these questions should point you toward a CMS that:
Has the features you need
If you want to display social media feeds, for example, ask your vendor if there’s a built-in widget for doing that or if that’s something you’ll have to develop yourself.

It should also support all the file types you intend to use.

Supports your workflow
You should be able to approve and update content easily and instantly. (See #9 for more on workflow.)

Is easy to use
Alright, this is a pretty obvious one. But do you know what a user-friendly CMS looks like?

The interface should be intuitive to navigate, even for employees who aren’t tech savvy.

Depending on the company you go with, most interfaces are template-based, making it easy to drag and drop images, choose fonts, and create powerful content in no time. Access from other devices should be simple. CMS providers often tout their software as usable from tablets and cellphones—which is great for updating content on the go. On the other hand, sometimes these mobile versions are lacking.

Make sure you see it in use before buying.

Built-in analytics should be accessible. If your CMS gathers data on your campaign’s effectiveness, you should be able to view and understand the basic stats without being a statistician yourself.

There should be options for viewing it in different kinds of charts and graphs.

Hang in there—we’ll be talking even more about what to look for in CMSs in the next chapter.

7. Not Enough Content
One of the greatest advantages over traditional signage is that digital signage isn’t static. Even with the content playing on a loop, the image on the screen changes frequently.

This means that even if a customer has seen a particular piece of content before, they’re likely to give it a second glance—paper signage might as well be wallpaper.

Don’t forget that to maintain digital signage’s effectiveness, it’s important to add new content frequently.

Many users of digital signage networks report only updating their content every other month, or even less frequently—and that’s probably not often enough. If it’s always the same, eventually people will stop looking.

And never changing it up means you’re missing out on chances to promote daily deals and take advantage of local happenings.

Solve it!
How often you update may depend on how large your company is, how frequently you offer sales and other promutable deals, and other factors.

Determine how often you want to add new content in advance.

You also need to have a plan in place for producing content when you need it. Don’t wait until it’s too late to start planning.

If you find yourself in a pinch, remember that you don’t need completely new content—it just has to feel fresh.

Keep a stockpile of relevant stock photos that you can easily swap out in your CMS. Sometime, a few new pictures, a different color scheme, and changing the wording of a header are all it takes to give the illusion of new content.

We have a few more tips for keeping your content fresh and localized in #8.

Also worth mentioning: budgeting for content production.

How much are you willing to spend?
Determine this, and decide who is responsible for producing that content. This is especially important for smaller companies that might not have graphic designers on staff.

Contracting graphic designers or other skilled individuals to produce content may produce visually appealing results, but can you afford to do it all the time?

Perhaps you’re willing to pay a graphic designer to produce advertisements for major sales events.

However, you decide it would be more cost-efficient to leave minor localized messaging up to that one guy who took a design class in college and kinda knows how to use Photoshop. Fair enough.

8. Trouble Localizing Content

The ability to provide localized content among multiple locations is cited in the top three reasons to adopt digital signage.

Why? Well, like we talked about, producing enough content can be challenging on its own.

But messaging is only effective if it’s relevant. As we talked about in the first chapter, modern digital signage is focused on providing information that’s important to the viewer.

One great way of doing that: providing localized content.

That is, content that’s relevant to a specific geographical area, reflecting the needs and interests of the demographics that live there. And even content created for a specific store—talk about hyper-local!

Here’s the issue.

Half of the banks in the previously mentioned study express difficulties in localizing content among their branches, and the numbers actually localizing content have decreased over recent years.

It’s a problem when one of your main reasons for implementing a signage solution becomes one of your main barriers towards using it effectively.

Solve it!

This is a problem where the best solutions involve planning in advance, but you can also start fixing it now.

Even if you have a system in place.

If you’re still in the planning stage, start considering solutions for making your content locally applicable.

One popular option is making each location responsible for some of its own content.

There’s a downside here.

This produces uneven results based on the time and personnel resources of each location. You could do the same thing on the regional level, which might allow for more oversight.

Giving access to local managers while reserving approvals for HQ, you can have localized content and brand consistency pretty easily.

Or, you can take advantage of modern-day data analyzing capabilities and produce some highly targeted messaging.

For example, your messages could vary based on the estimated wait time in a queue, or by local demographics such as languages spoken.

Also worth noting: if your signage is integrated with the Internet of Things and tied into your inventory system, this essentially solves both your content production and content localization woes.

Here’s why:

By having your CMS automatically promote items that are overstocked, or appropriate to the weather, or whatever other factors you select, you guarantee that your digital signage’s content will be always be relevant and timely.

The catch is that if your system is already up and running, that sort of solution might be more complicated to implement.

Additionally, an advanced system like that won’t be right for every business or organization.

Some may have a slim budget, or a lack of advanced technical knowhow.

If all you want is a way to display nice looking ads and pictures, that’s absolutely fine! It’s all about what’s right for you, and everyone has to start somewhere.

On the simpler side, you can set up your digital signs to display the local branch’s social media feeds, or even the local weather.

CMS will usually include built-in widgets for doing exactly that. It’s a small way to make the experience more personal for the customer.
9. Workflow Difficulties

Speaking of content, what’s your strategy for evaluating and approving new content?

Referring back to the bank study, over 15 percent of respondents reported workflow issues in getting new content approved.

Your new network won’t run itself!

And while something like running your Facebook page could be fobbed off on the nearest Millennial, maintaining your digital signage is a much more significant responsibility.

You have to decide:

◊ Who creates content?
◊ Who approves content?
◊ Who schedules the content?
◊ Who’s responsible for maintenance?

Often, the system is too complicated, or the people responsible for approving the content are too slow to respond. This might lead to missed marketing opportunities, especially on the local level, among other frustrations.

Solve it!

Have a clear and consistent system in place for approving new content, plus readily available guidelines as to what sort of content is appropriate and likely to be approved.

That makes everyone’s job less stressful!

Your CMS should also allow you to set different permissions for each user. Whoever is tasked with scheduling content shouldn’t need the ability to add more users or edit the content, for example.

Setting permissions that correspond with each person’s responsibilities will help you avoid confusion and redundancies.

Don’t stop there!

A cloud-based solution is a good way to centralize the approval process and keep people from having to play email tag.

The ability to create content in outside platforms (Adobe, Google Apps, Microsoft, etc.) and easily upload it to the CMS is essential, too.

It’s much easier to collaborate on and approve content that way, rather than wait for the approver to log into another system to see the updated content. This makes for more nimble responses.

Fast updates can help your bottom line!

If a product is in high demand, a slight price increase can beef up your bottom line fairly quickly.

On the other end of the spectrum, if a product has worn out it’s welcome, the price can just as easily be reduced for quick sales.

Buy One Get One promotions can help achieve this.

Boloco, a fast casual restaurant based in Boston, operates 22 locations in the Northeast. They use digital menus in eight of these locations, because they value snappy updates.

Alexandra Dunk, Boloco’s director of marketing, said, “The ability to change content at a moment’s notice, as well as potentially minimizing future costs by not having to replace menu boards on an on-going basis, were both factors in our decision. We have the ability to not only change our permanent menu itself, but to also feature content about our limited-time offers or other Boloco happenings.”

10. Workload Division

Even with the best digital communication strategy in place, a well-designed digital signage network won’t maintain itself.

Creating and approving content, troubleshooting technical issues, even wiping dust off the screens (if you don’t have dust-resistant commercial displays)—all of this takes time.

17 percent of surveyed banks mentioned problems with providing enough labor to keep their digital signage network running smoothly, with 30 percent requiring three or more FTEs.
Solve it!
Recognize that while installing a digital signage network can bring benefits, it, like traditional Point of Purchase signage, requires support in the strategy, design, deployment, maintenance and so on. If you don’t have enough manpower resources to allocate you’ll end up with stressed employees and subpar content.

Providing sufficient training for those involved in the project and investing in user-friendly CMS will cut down on the difficulties in this area.

You may wish to allocate part of your budget for paying an experienced person to manage your digital signage.

Depending on the size of your network this may be a Content Champion/Manager, a graphic designer, and an IT support member if running an on-premise network. Staffing models will vary by size of network, content requirements, and number of screens.

If it saves untrained and overworked employees from spending frustrating and fruitless hours troubleshooting simple problems, it may be worth it.

Or maybe your story looks more like this.

You have a very simple purpose in mind for your digital signage and want the least troublesome solution possible.

If that’s you, many digital signage companies offer packages that are essentially “plug and play.”

Don’t fall into the trap of getting a more complex system than you need.

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Here are 10 common problems for you to identify—and avoid!

1. An Unclear Vision
   Your vision will help you determine how to measure ROO (return on objective) for your digital signage. Different goals lend themselves to different ROO-measuring strategies.

   You must decide your goals and vision for digital signage before you launch a campaign.

2. Fear of Spending
   Make sure you only spend money where you need to. That’s to say, while spending is necessary, overspending certainly isn’t.

   Having a clear vision and plan will help you decide which features are needed and which are merely desirable.

3. Poor Integration
   Creating an omnichannel experience requires a lot of forethought and planning—we offer some advice here if you’re interested.

   ◦ Make the most of the data you already have for creative integrations (weather reports tied to purchasing trends for example)

   ◦ Keep your customer’s behavior in mind so you can capitalize on what they’re already looking for.

4. Not Enough Bandwidth
   If you’re using the Internet or local VPN to stream your content, you may run into issues with your ISP, who often limit the amount of bandwidth each customer can use.

   Figure out your required bandwidth in advance, and get in contact with your ISP to see if your current plan can handle it.

   Good news! If you’re using local playback, bandwidth will be less of an issue.
5. Too Many Hardware Options
Hardware is usually specific to your industry, use case, and goals. Since there are so many options, it’s not worth wading through it unless you know the digital signage hardware landscape well.

Talk to your digital signage partner or OEM for their recommendation.

6. Confusing Content Management Software (CMS)
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These are the four questions you should ask yourself when choosing a CMS.

1. With whom do you want to communicate?
2. What message do you want to deliver? (And what action do you want your audience to take?)
3. Who is responsible for delivering this message, and what does success mean for them?
4. Where does the content/message reside today?

The answer to those questions should point you to a solution that:

◊ Has the features you need
◊ Supports your workflow
◊ Is easy to use

7. Not Enough Content
To maintain effective digital signage, it’s important to add new content frequently.

◊ Determine your content schedule beforehand
◊ Store relevant royalty-free photos
◊ Budget for content production

8. Localizing Content
Localized content is content that’s relevant to a specific geographical area, reflecting the needs and interests of the demographics that live there. And even content created for a specific store—talk about hyper-local!

Get a digital signage CMS that can grant access to local managers while reserving approvals for HQ. This gives you the ability to have localized content and brand consistency.

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Digital Signage Software: What to Look for
What to Look For in Digital Signage Software (CMS)

Digital signage CMS (or content management system) is the software that lets users set up what content gets displayed on which screen, and when.

There are CMSs that require you to create and customize content within the CMS, and others that allow you to create content within the wide variety of creative software applications available on the market and then import them into the CMS in a variety of content formats.

There are many CMS options. Many of them are for niche uses, or specific requirements.

Some are free with many paid add-ons; some have a subscription-based model. Some are web-based, with content stored on the cloud; some take the form of a downloadable program.

At best, they can enable you to put out gorgeous content and streamline your workflow.

At worst, they can be a labyrinth to use, fail to offer key features, have limited scalability and quickly become outdated.

With so many options, it can be hard to narrow down what makes a CMS a good option, and which CMS is right for you — because let’s face it, there are no one size fits all.

In this chapter, I’ll give you some advice about choosing a CMS.

We’ll start with different features to look for: the ones that every good CMS should offer, vertical-specific features that will make your CMS more useful to you, and features that might matter to you, specifically.

And then we’ll wrap up with how to talk with CMS providers to figure out if their product is right for you.

I put together 7 questions you should ask when evaluating digital signage software. It offers a framework to work from no matter what industry you’re in.

This PDF takes you step by step through what you should consider. Print it out or download it for reference when the time is right. Download your PDF here.

Three Things You Want in Your Digital Signage CMS

1. The Basics

There are some features that any good CMS should have.

Usability

Let’s be honest: today’s CMSs are much easier to use than early ones. The instruction manuals used to be inches thick, and could take weeks to train users.

Now we’re beginning to see CMS with more intuitive user interfaces.

Still, as you may remember from the previous chapter, difficulty in using CMS is among the top three complaints of digital signage users. Some poorly designed interfaces make it look like you’re writing code.
The interface you use to interact with the CMS (whether on the web, as with a cloud-based CMS, or downloaded to your server, as with a locally-hosted CMS) should be sleek and easy to navigate. The end users, including your content creators and the persons responsible for scheduling that content, should be able to understand it with minimal training.

This is especially essential for small-medium businesses (SMB) which may have fewer personnel resources, unlike at the enterprise level.

**Content Creation Methodology**

Technology integration improvements now allow you to create your content in the creative tools you already know and love and then place them into your CMS.

If the CMS you are looking at requires creation to be performed within the CMS, the content creation tool should be intuitive to use and support all the common file types.

Unless you are a highly tech-savvy company and want a high degree of customizability, a tool that allows you to drag and drop content to zones would be ideal.

It should be simple to import content from outside programs, such as Google Drive, Microsoft, and Adobe products.

Again, this feature is extra important for both SMB and Enterprise. Smaller businesses may also want access to pre-made templates and a library of high-quality stock images that are free to use in their signage.

See Chapter 8 for tips on how to create compelling digital signage content.

**User Controls**

The larger your company and the more screens you have, the more people will be involved in managing your digital signage system.

Clearly defining each person's role and access level will alleviate confusion and redundancies. You should be able to assign different users different permissions regarding which functions of the CMS they can access and alter.

Your content creators don’t need to be able to schedule that content, if that’s not one of their responsibilities.

A quick note:

Some software might have limits on the numbers of unique users that can be added.

Know how many you expect to have on the system and ask potential CMS providers how many their software can support.

**Content Scheduling**

One of the most basic and yet most useful features of a CMS is the ability to set certain content to go live on specific screens at a specific time.

You should be able to specify exact times.

In select use cases, businesses may be scheduling their content weeks or even months in advance.

There should be a calendar or scheduling feature that makes it easy for you to see what will be on display on a given date.

If your media player caches content (rather than receiving it in a constant stream), you should be able to schedule when your CMS pushes new content to the devices.

That way, you can pick times of low bandwidth demand and avoid internet slowdowns. Best practice is to update devices around 3am local time.

**Security**

Especially with cloud-hosted content, it’s important that the CMS offers high-end data security in transit and at rest. This includes encryption and regular security patches to fix previous vulnerabilities.

Of course, you also want to prevent unauthorized users from gaining access to your screens.

Last year, the owners of a digital billboard in Atlanta learned that the hard way. Hackers gained control of the screen over the internet and changed the image to a man's posterior [56].
As embarrassing as that is, it could have been worse. Security is extra important if your digital signage is integrated with other store systems.

Customers want to know that your data is secure. If your security is breached, their trust in you is breached as well.

**Scalability**

The service should be able to “grow” with you and accommodate more screens.

If you decide to expand your amount of digital signage or expand your footprint into other countries, it would be pretty frustrating to have to toss the software you already know and understand, and learn another one from the bottom up.

You should also be confident that the CMS provider will continue to support the product over time as your digital signage needs evolve.

**Remote Access**

You should be able to log into the CMS at any time, from any device. Cloud-based CMS will definitely include this capability, and some on-premise solutions may as well.

The world has gone mobile and having the ability to drive, edit and program content through your phone, tablet or PC is becoming commonplace.

Being able to update or approve content remotely could prove useful in any number of situations.

Perhaps your advertising team sees an opportunity for a limited-time promotion, but the person tasked with approving new content already went home. Thanks to remote access, she could hop onto any device and make the approval in seconds.

Whether they’re on the road or standing in front of the commercial screen they want to change, they should be able to control the content from anywhere.

**Customer Support**

Once you purchase the CMS, you shouldn’t be left to your own devices (pun intended).

Especially with the Software as a Service (SaaS) model, there should be some basic aids in place to keep your digital signage software running smoothly. The software should be able to update itself in the background without needing your interference. The CMS provider themselves should be hosting regular updates to the software.

Even better: these updates should not disrupt your signs’ functioning.

Your CMS provider should have a help hotline, or some other straightforward way to contact them for answers and assistance if you encounter difficulties or bugs.

2. **Industry-Specific Digital Signage CMS Features**

Don’t forget:

Depending on what vertical you’re in, you may prioritize some features over others.

It’s wise to look at case studies from your own vertical, so you can understand how your competitors are using their own commercial displays. Staying on top of trends will help you stand out.

Here are examples of important features from three verticals.

**Education**

While still a relatively small market for digital signage, education is poised to grow by leaps and bounds in upcoming years.

In the United States, the government has big initiatives to close the gap between the haves and have-nots when it comes to digital learning. Technology funding is in place to drive improved learning outcomes and to prepare students for their next phase of life.

Today’s kids are “digital natives”. They’ve grown up around computers and smartphones. They expect information, attractively embedded in media, to flow quickly and easily to them.

**Here’s why.**

Staying on top of trends will help you stand out.
Both at the K–12 and higher education levels, educators are realizing that digital signage is a great way to teach both individuals and whole classes, work collaboratively, and to keep students engaged and get information to them in a way they’ll appreciate. Digital signage in education can serve many purposes.

Here are a few.

**Safety and Security**
As of 2013, one in three parents of K–12 students feared for their child’s safety[59] in school.

If you’re a parent, you can probably rattle off a laundry list of potential hazards: severe weather, abductions, intruders, and on and on.

With the help of the right hardware and software, digital signage can help ease parents’ fears and protect children.

Let’s be clear: Emergency Alert capabilities can be pushed manually or linked to emergency notification services, which may require third-party software (rather than being built into the CMS). Check that this software and your CMS are compatible and can work together. Also, determine the cost of adding the feature into your network.

One of the points of vulnerability is during pick-up. Parents and administration alike worry about a child getting into the wrong car. Today, some schools may use license plate and facial-recognition software that works with their CMS to confirm children make it to the right car.

Or they may choose a system like the one recently installed at North Springs Elementary School[60] in Columbia, S.C.

Picture this.

Each child’s guardian receives an RFID-equipped card with their contact information and photo ID.

Upon arrival at the pick-up area, staff scan the card. Then the information is displayed on signs inside, along with instructions for the student to proceed to the pick-up area. It also appears on staff’s tablets, ensuring they conduct each child to the right card.

Aside from pick-ups, in education, digital signage often doubles as an emergency alert system.

**In the Classroom**
While children at school should be kept safe, they’re there to learn. Digital signage has an important place in the classroom, too.

Studies show that overall, regularly displaying PowerPoint during lecture has no negative impact[62] on students’ final grade outcomes. It may even have a positive effect.

In fact, students prefer lectures that have visual aids. Students who are hard of hearing will appreciate it as well.

Leveraging technology in the classroom as a tool to better educate students is mission critical. It is more than just displaying visuals in a one-to-many format, but rather the key to relevant, up-to-date content by grade in touch or non-touch formats.

It gives access to animated maps, videos, and learning tools that engage students in a collaborative manner. Providing gamification in education and providing both a teaching and learning environment will improve test scores and overall results.

Digital signage can also be used to display announcements, reminders about upcoming assignments, test scores, and more.
If you plan on using digital signage in the classroom, you’ll want CMS features such as

- **User Controls:** Historically the teacher, onsite administration, the district, and the networks IT management have control over the various classroom displays. If not in entirety sometimes by zone. Understanding the CMS user control options and number of user seats available may be important to you when selecting your software partners.

- **Importing Content:** Most teachers will already have lecture visual aids that should be easy to import into the CMS. And at the K-12 level, there’s a lot of content available online that teachers may wish to use. Your CMS should make it easy for them to import this content as well.

- **Content Scheduling:** Eliminate outdated PA system morning announcements. Announcements can be recorded at any time and paired with visuals, then set to be played at a certain time in the morning.

**Wayfinding**

New schools are scary.

But today, they’re a little less so.

**Mobile wayfinding options** are creeping into schools. Now newbies can refer to one of the digital touchscreen kiosks placed strategically around campus or their mobile phones to find their way to the art or music room.

Navigating unknown campus hallways for the first time can be intimidating.

But as mobile technology continues to become a huge part of our society, so do mobile solutions.

*For such a system to work, you’d need to be able to build GPS based interactive maps in your CMS.*

If you plan on including a mobile wayfinding system, your CMS would also need to be compatible with the app you chose and able to send directions to it either in real-time, or as a PDF.

**Retail**

Retail is the **largest market for digital signage**, and the potential uses are diverse.

For just one example, take Ford’s “The Truth About Trucks” kiosks.

They wanted to give customers a deeper, more interactive look at the F-150’s capabilities and options, so they built a kiosk that would allow customers to build their own ideal trucks, compare with competitor’s trucks, and more.

The CMS also tracked how often customers visited particular pages so that developers could focus on developing better content for those pages, or redirecting flow so less-seen pages are visited.

But remember, most kiosk or interactive solutions are not out of the box with a CMS.

They are custom-development, so expect to pay a fee for both the development and content to get going and remember to budget upgrades annually.

Here’s some other uses, and the CMS features that enable them.

**Loss Prevention**

In 2014, more than $32 billion worth of products[^63] and money vanished into the pockets and purses of unscrupulous customers and employees.

![Security Camera](image)

That’s a lot of shrinkage.

If you’re in the retail vertical, you already know how important loss prevention is. But did you realize that digital signage can help?

Yes it can! Many stores show security camera footage on screens to remind shoppers and employees alike that they’re being watched. Why not have these screens contribute to your digital signage network by adding messaging[^64]?

Short messages welcoming shoppers to the store can catch their eye and remind them that the security cameras are there (while making it harder for them to pinpoint blind spots by interrupting the stream).
Messaging can also encourage shoppers to watch their own belongings and report suspicious behavior to staff. They’ll also help the security footage look less inhospitable. And if you play advertisements as well, it may help boost sales and offset your shrinkage.

In back-of-house uses, messaging can discourage internal theft and remind employees of the potentially dire consequences of committing crimes.

In order to make this work, your CMS would need to be able to play live video feeds in the format your security cameras record in, and intersperse the feed with preselected messaging.

**Backend Database Integration**

Today, stores are realizing they can leverage the data they gather from the Internet of Things and their Enterprise Resource Planning software into sales... And that digital signage can help.

We mentioned this in the last chapter, but in case you need a refresher, here’s how it works.

Software “watches” your inventory, tracking the rates at which items sell. Then, it uses algorithms to figure out which items to promote and adjusts prices accordingly. Items that are in high demand may increase in price slightly, and items that are overstocked may go on sale.

These price changes are put into the system automatically. If you use digital price tags, those update themselves, and screens around the store can add automatically generated ads to their content.

Usually, it’s not the CMS that does this, but another piece of software that works with your CMS. Hadoop, by Intel, is an example of a system that can store, analyze, and use vast quantities of data in real time.

The flexible software has been used to target individual shoppers with advertisements, and also to analyze POS data to forecast future demand.

**Content Localization**

Remember, the ability to localize content is one of the top three reasons cited for installing digital signage.

The reason is clear.

Localizing content means you’ll be able to target customers with messaging that’s more relevant to them. More personal. And thus, more effective.

Entire stores can be built on the principles of localization.

For example, what if your store was in an area with high numbers of retirees?

Here’s how one grocery chain answered.

They decided that their stores in those areas would be designed to serve retirees specifically. They widened their aisles to make them accessible for those needing mobility aids, and stocked many health items and single-serving, easy to prep meals.

*In just two years, revenue at one of the remodelled stores doubled.*

Localizing the content on your digital signage helps you get some of the same benefits, for much less cost than remodelling your whole store.

Today, digital signage software exists that automatically detects and records the demographic information of people approaching, guessing their age, gender, and race.

This third-party software can then work with your CMS to present content that’s likely to appeal based on those factors.

Or, you can take that data and use it to create more effective content.

Aside from that specialized software, here’s some other CMS features that will help you localize your content.

◊ **User controls:** By assigning
different permissions for certain users, you can put each region or location of a store in charge of part of their own content. This allows them to take advantage of local events or factors that the central corporate office wouldn’t even know about. For quality control purposes, HQ can retain the ability to approve or reject content.

- **Widgets**: CMSs often come with widgets, such as the local weather or social media feeds, that can be dragged and dropped into the content. If a location controls its own social media, that would be a very simple way to present some localized content.

**Ad Network Model**

As we’ve been hinting at, one of the biggest digital signage uses in retail is advertising.

Studies show it’s far more effective at drawing eyes and motivating action in consumers than traditional signage.

If you plan on using digital signage as your advertising network, what sort of features will you need and want in your CMS?

- **Granular scheduling** down to store, region, or designated market area (DMA). This will allow you to localize your advertising per region or per store to show local or regionally-relevant content.

- **Ability to add users**, so you can share content to outside advertisers. They can maintain their content while you retain publishing and audit rights.

- **Remote control ability**. You want the ability to turn screens on and off, and adjust volume and brightness levels, without having to fiddle with the device itself. (Bonus: This will keep the controls safe from, say, mischievous teenagers.)

- **Built-in analytics**, such as ad counts and interaction counts.

- **Proof of Play**, to document and report for invoicing purposes.

**Quick Serve Restaurants**

QSRs have many potential uses for digital signage—in fact, they go, together like buns on a burger.

**Digital Menus**

Quick Service Restaurants that utilize indoor and outdoor digital signage see a 5 to 8 percent increase in revenue.

The increase, in part, can be attributed to easy-to-read menus with more food options.

If a digital sign’s being used as a menu board, the most important features are the ability to display high-quality images and schedule content—especially if you have different breakfast and lunch/dinner menus.

Another essential: **redundancy**.

Perhaps the only advantage of a traditional menu over a digital is that it’ll never go blank on you.

No problem! Your CMS can help mitigate that risk.

Say you have a grouping of three screens that act as a menu. If one screen experiences issues, the CMS should be able to distribute its content between the other two.

The CMS should also cache content on your media player so if the Internet goes down and it loses its connection to the cloud, your content will continue to play.

**Beacons and Digital Signage**

When I say beacon, I mean a digital transmitter (or tracking device) that communicates with a shopper’s smartphone in an effort to improve their shopping experience.

Placed anywhere you deem suitable in your restaurant, the transmitter communicates with a smartphone’s Bluetooth and transmits information directly to anyone that has installed the store’s app.

Beacons placed near digital menu boards can alert restaurant employees when a loyalty customer has come in.
Specials can come up on those boards that appeal to that customer, giving the establishment the opportunity to personally cater to the customer without saying a word.

**Ordering Kiosks**

Do you love the convenience of a touchscreen ordering kiosk? Many customers do.

Aside from increased sales, many canny restaurateurs have noticed that buying and maintaining a kiosk costs less than paying the salary of a cashier.

In other words, kiosks are here to stay. If it’s functioning as an ordering kiosk, the CMS should support touch-screen interactivity.

**Back of House Uses**

Interactivity might be important for back-of-house digital signage being used to train employees as well. Or how about a nightly close shutdown checklist or digital time cards?

You may also want the ability to integrate with management systems and show metrics like drive-through efficiency[^60].

If that’s your hope, you’ll need the CMS to be able to work with whatever other software you’re using. Ask your CMS providers to make sure it will.

**Advertising**

For an example of how QSRs are using digital signage, let’s take a peek at Tim Hortons.

This Canadian chain famed for its coffee and donuts not only has digital menus, but their own TV channel, TimsTV. Playing on screens in the dining area, this channel plays news, entertainment, and ads tailored entirely to the Tim Hortons brand.

Even if your own advertising plans are less elaborate, you can see how using digital signage to advertise can seriously boost your brand.

For advertising, **your CMS needs the ability to support multiple users with different, assigned permissions.**

Many QSRs assign digital signage promotions to their ad agency or management services.

Fact: Being able to allow the ad agency direct access to the relevant parts of your CMS can be a huge time-saver.

**3. A Good Fit for You**

**Ultimately, the best content management system is the one that fits your needs the best.**

If you have a specific vision for your digital signage (and you should, definitely have one) then by all means seek out a CMS that can deliver on that vision.

This probably means looking for specific features.

Do you need support for specific file types?

Do you want built-in widgets for displaying social media and weather reports?

Here’s the catch.

While it’s easy to pile up long lists of features you want in your ideal piece of software, eventually you do have to face reality.

Limited budgets mean that some of the most advanced solutions may be out of your reach. Make sure to sort your desired features by “must-have” and “would be nice.”

Also consider the human side of that equation.

How much time do employees have to devote to creating content? Can you spend hours training them in the new system? Can your IT department spare time to troubleshoot a complicated system?

You may have to sacrifice some features or degrees of customizability in favor of streamlined simplicity.

**Finding Your CMS**

By this point, you’ve developed a thorough profile of what you want from a content management system.

You know what features are important to you—both what you need to have, and what would be nice to have.

Lastly, you also know your limitations—your budget, how much time your IT department has to dedicate to troubleshooting the system, how tech savvy the end-users are, and so on.

It’s time to start assembling a list of questions to ask software providers and officially begin the search for your CMS.
You should ask about:

- Any features not listed on the software provider’s website—especially ones you identified as important during your earlier brainstorming. I.e. scalability, security and speed.
- References—you’ll want to talk to some of the provider’s other clients to get an idea of how the system has been working for them, and whether the provider was easy to work with. (Keep an eye out for reviews online as well!)
- Pricing information, such as model (purchase, lease, or software as a service) and discounts for large deployments
- Support, such as remote software updates, a help hotline, and training for the system’s users
- Compatibility with other hardware and software that you hope to use
- Ability to display and create certain types of content, such as ads, interactive content, social media feeds, and specific file types
- And any other relevant questions you can think of

If your provider overestimates their ability to meet your needs, or the software is lacking in a key feature, you’ll lose money and face the headache of trying to salvage your content and switch to a new CMS.

As you’ve been researching features, you’ve probably run across several pieces of software that appeal to you. That’s a good place to start.

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Ultimately, the best content management system is the one that fits your needs.

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Do you need support for specific file types?

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While it’s easy to pile up long lists of features you want in your ideal piece of software, eventually you do have to face reality.

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How much time do employees have to devote to creating content? Can you spend hours training them in the new system? Can your IT department spare time to troubleshoot a complicated system?

You may have to sacrifice some features or degrees of customizability in favor of streamlined simplicity.
Questions to Ask:

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You know what features are important to you—both what you need to have, and what would be nice to have.

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It’s time to start assembling a list of questions to ask software providers and officially begin the search for your CMS.

This is what you should ask about when searching for a digital signage CMS:

1. Any features not listed on the software provider’s website—especially ones you identified as important during your earlier brainstorming. Ie. scalability, security and speed.

2. References—you’ll want to talk to some of the provider’s other clients to get an idea of how the system has been working for them, and whether the provider was easy to work with. (Keep an eye out for reviews online as well!)

3. Pricing information, such as model (purchase, lease, or software as a service) and discounts for large deployments

4. Support, such as remote software updates, a help hotline, and training for the system’s users

5. Compatibility with other hardware and software that you hope to use

6. Ability to display and create certain types of content, such as ads, interactive content, social media feeds, and specific file types

7. And any other relevant questions you can think of

It’s important to be as thorough as possible when talking to a prospective software provider. After all, there are endless hundreds of options out there—but you’re only picking one, which you will hopefully use for years to come.
Digital Signage Hardware: What to Look for

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Digital Signage Hardware: What to Look For

Digital signage hardware forms a crucial part of the holistic solution, but customers sometimes shop brand or price only unless the project is of significant size. And in today’s market there is much confusion around the difference between using a consumer TV versus a commercial display.

Selecting the right hardware is just as important as selecting the right CMS software can be, and should be just as carefully chosen to suit a particular use.

It’s easy to focus on software or on content since those can be a little more “sexy.”

The truth is, you need to focus on all parts of the digital signage rollout in order to get not only a cohesive solution, but a scalable, secure network.

Each digital signage system needs three major hardware components:

- **Media Player:** The media player is the “brains” of your digital signage. The media player is what pushes your content to the screen (one media player per screen unless a splitter is used to drive multiple screens from one player).
- **TV or Display:** You definitely know this one. It’s where your content shows up. Sometimes, the media player and the screen are integrated, with the player hidden inside the screen’s casing. Small business may get away with a consumer grade TVs for their display, but consumer displays are meant for approx 6 hours of play per day, typically have a one year warranty, have limited functionality, and are meant for landscape use. Commercial grade displays come in three basic types: LCD, LED or OLED.

1. **LCD** – LCD displays are generally less expensive, wider in depth and weigh more than LED displays. LCD displays have been the most widely used type of display for signage until recently.

2. **LED** – Increasingly more popular, due to performance and economies of LED panels that are back-lit, edge-lit and direct-lit. LED types use either a matrix of LEDs behind the screen or an array of side-mounted LEDs to replace the cold cathode fluorescent light lamps of LCD. Although the concept is generally the same as back-lighting, LED displays offer a sharper, clearer image and offer brighter colors and better contrast over LCD. LEDs also offer lower operating costs by using up to 50 percent less power consumption than...
**CCFLs.** LEDs offer a slimmer profile, with some commercial displays being less than a few millimeters in depth versus up to 5 inches with CCFL displays.

3. **OLED –** organic light-emitting diode (OLED) OLED technology is emerging as an advanced flat-panel display option. These flexible, bright, ultra-thin, highly energy efficient displays are similar to a regular LED, except that they are made up of organic semiconductor material sandwiched between two electrodes that produce light when a current is made to flow through its volume.

- **Mounting:** Your screen needs something to hold it up, and that’s where mounting comes in. There’s many types, from simple wall and ceiling mounts to floor stands. I’m also going to include stands and kiosks in this category.

Once you understand your options, and a framework for how to approach this, you’ll find it much easier to select hardware that’s right for your project.

I made a free guide for you that will help you put these strategies into action when you’re evaluating digital signage hardware.

The PDF outlines — step-by-step — exactly what questions to ask and how to approach hardware using the concepts I talk about in this post... you can bookmark it, print out, or keep it in a folder for reference. [Get your PDF here.](#)

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**Understanding Your Media Player Options**

When designing digital signage, people tend to go for the things that look good from a user interface perspective, like the Content Management System (CMS).

And it’s vital to have a good CMS.

But the best CMS in the world is worthless if the players fail to deliver your message to the targeted audience. In the end, selection of a digital signage solution is a balance across all components with respect to the solution requirements.

**The Industry**

The digital media player industry is still young, and still evolving. You may remember from Chapter 1 that digital signage itself was born alongside media players.

Since those early days, the industry has boomed. Most major electronics manufacturers offer media player options, as do several large digital signage companies.

Even Google’s getting in on the digital signage game, with partnerships with a number of different OEMs to build Chromeboxes, Chromebits, and Chromebases based on Chrome OS (discussed lightly below and in more depth in Chapter 7).

There’s an option for every use case and budget, for SMBs to enterprises.

Distinguishing the players from each other are factors like size, processing power, manageability, commercial setting–friendly components, memory, storage, price, and more.

**The Categories**

Media players can be loosely grouped into a few categories.

Since there’s such a glut of options on the market, knowing what general category you’re interested can be your first step in narrowing down your choices.

Each category will contain some options that are designed for use with digital signage, and some options that aren’t specifically created for digital signage but can work to power it anyway.

We’ll run through each, giving use cases and examples along the way.

There’s another grouping that overlaps with these categories, so I’ll address it separately here.

Proprietary media players are ones designed by and/or built for a particular digital signage company.
Hypothetically, they could show up in any of the below categories.

Their main advantage is that they’re optimized to work within a digital signage environment created by that brand—no worries about compatibility whatsoever.

**Boxes**

Box-type media players are, in essence, small form-factor computers—usually about 5x7". They were the first type of digital media player built for digital signage. They run on a variety of operating systems: Chrome, Mac, and Windows, primarily. Some are designed specifically for digital signage, and some are meant as home computers but repurposed for digital signage.

Worth highlighting here as an example are Chromeboxes. Born in 2012 they’re small form-factor computer boxes that run on Chrome’s OS.

The idea is that you can set the box on your desk, plug in a monitor, mouse, and keyboard, and set up your own little desktop computer... or skip the mouse and keyboard and have a digital sign.

With a low price point and the ability to enroll in Google’s powerful Chrome Management Console, they’re an increasingly popular option. Chrome itself doesn’t make these devices; rather, there are numerous models on offer from OEM’s like HP, Asus, Acer, and more. They’re differentiated by their size, materials, processors, RAM, and other factors. AOPEN offers Chromeboxes specifically meant for signage. (Skip to Chapter 7 to learn a lot more about Chromeboxes.)

Box-type media players offer some advantages. For one thing, they’re super flexible in terms of how they can be set up and networked with other devices and accessories. And there are many, many options on the market for many needs.

On the downside, boxes range from about $150 for some Chromeboxes to well over $800 apiece. Those heavily optimized for commercial settings and high-end performance will be more expensive, of course, and you’ll need to buy the screen separately.

Also, you’ll have to hide the box somehow.

Use cases include... Well, just about any digital signage application imaginable. But for just a few, think about giant, tiled video walls; wayfinding systems; POS advertising and self-checkout systems; front desk information hubs at schools; interactive changing rooms at department stores (check out Chapter 10 for other futuristic ideas); and much much more.

**Sticks**

Stick media players are similar to the box type, but shrunk down even smaller and plugged directly into the screen.

They typically have fewer peripheral ports and less-powerful processors than box players do.

It can be a little confusing looking at stick media players, because there’s some very similar devices that might also be marketed as digital signage tools, but aren’t truly media players.

To exemplify the difference, let’s look at two devices from Google: the Chromebit and the Chromecast.

**Streaming Devices vs. Media Players**

**Chromecast**, born in 2013, is a media-streaming device that plugs into the HDMI port of a screen, allowing the user to stream content. The device is small and is shaped like a mini hockey puck.

After you plug it into your HDMI port and connect to a Wi-Fi network. It acts as a portal for the content on your computer or smartphone to be played on your display. It also includes apps such as Netflix which let you stream content to the display.

The Chromecast, as its name implies, is intended to “cast” content from one location such as a computer, tablet or smartphone, onto a display. You’d need a dedicated laptop or computer for each and every Chromecast.

**The Chromecast is not a media player. It depends on another device to act as the media player and simply acts as a link between that device and the screen. It cannot be managed with CMS.**
Now contrast that to the Chromebit, which is a true stick-type media player.

Chromebit, born in 2015, is a small device that runs on Google’s Chrome OS operating system. The stick-like device closely resembles a thumb drive.

Chromebit, when plugged into the HDMI port of a monitor, acts like a tiny personal computer, with access to the Internet and Google’s browser-based apps.

The Chromebit is seemingly similar to the Chromecast, but in fact, it is in a completely different class of machines—it is a general purpose computing tool.

The Chromebit is functionally equivalent to a Chromebook, without the display.

So you can think of it as a $85 computer on a stick. The Chromebit is more functionality aligned with a Google Chromebox, with the same performance capabilities, but without the ethernet port or multiple peripheral ports. It allows the user to add a Bluetooth keyboard or mouse.

Vitally: It also allows the device’s settings to be managed with Chrome Management Console, and its content to be managed with a CMS.

Because of this, the Chromebit provides more functional capabilities, complexity and flexibility than the Chromecast.

More About Stick Media Players

Stick media players often run on lightweight operating systems like Chrome OS or Android. Lightweight isn’t necessarily a negative: most also have less powerful processors (think a 1.8GHz Rockchip) than box media players have, and an OS that isn’t resource-intensive will run much more speedily.

They should be able to play anything up to HD video with ease, though they may struggle with 4K video or zoned video.

One attractive factor is the price point. Chromebits are a mere $85 per unit, which is about half the price of a very basic Chromebox.

Also appealing are the tiny size and low power demands.

However, stick media players are generally not considered enterprise grade solutions. Most are primarily made of plastic and don’t have long warranty options. They won’t be as durable in a commercial environment as an optimized box player.

Many won’t be able to handle more obscure file types or complex applications.

Use cases include classroom signage; lobby signage; safety training and enforcement in QSR and other settings; and advertising-centered signage at businesses, especially at SMBs.

All-In-One

All-in-one media players are a newcomer even in this young industry, and they excite many people who appreciate convenience and streamlined systems.

With all-in-one media players, the media player is integrated with the screen.

There’s a couple different ways to do that.

A small box-type media player can be mounted behind or within the casing of the screen. This can lead to bulkiness, or cause the screen to stick out far beyond its mounting.

As an example: In Chapter 7, we briefly talk about Lenovo’s Tiny-in-One solution, which allows you to take one of their ThinkCentre Chromebox Tiny devices and install it in a screen’s casing.

Or, the display can make use of System-on-Chip technology. That’s right: the media player is condensed down to a chip and built into the screen. This allows the screens to be much slimmer.

All-in-One players are appealing due to the price point and convenience. You (typically) don’t have to buy the screen and player separately. Plus, setup couldn’t be easier. Just plug it in and connect to WiFi or Ethernet.

The downside: Decreased flexibility. There aren’t as many options in terms of size and screen type as when you’re mixing and matching media players and screens separately.
Chapter 5: Digital Signage Hardware: What to Look for

You’ll have a difficult time upgrading memory or storage, or even troubleshooting issues, with the media player hidden away in the screen. And with a SoC, if either the screen or the media player dies, the whole thing will need replacing.

Plus, there’s just not as much you can do with them—you’ll have a tough time setting up a complicated video wall or touch-based payment system with a SoC or other all-in-one player, especially one not optimized for commercial settings.

It can be done, though: pop over to Chapter 7 to see how a fish restaurant gave the franchise a facelift using Chromebases.

Use cases include wayfinding at malls, schools, and medical facilities; sign-up kiosks at businesses; POS systems; teleconference-enabled conference room signage; and more.

Which One is Best: A Quick Comparison

Especially at the enterprise level, there are many players on the market for digital signage.

We wanted to review some of the more popular devices within the most common categories: Chrome-based, PC-based (Mac/Windows), embedded within a display, and proprietary.

And here’s what we picked to represent those categories:

Blackbox iCompel and Cisco Edge (proprietary), LG 55LX (embedded within a TV/Display), Mac Mini and Dell Precision (Mac and Windows PC, respectively), and Asus’ Chromebox and Chromebit (Chrome-based).

The review focuses on the device attributes needed for an effective, secure, scalable solution.

How’d they measure up? Read on to find out!

Comparisons

Natively Secure Operating System

Is the operating system inherently or “natively” secure?

This goes to the design methodology and approach to how the operating system is maintained and updated.

Chrome OS wins hands down in terms of known issues (absolutely none!), rapidity and approach to patching and updating (all automatically controlled by Google).

Google designed the commercial version of Chrome OS to be enterprise-grade by providing the capabilities needed by large organizations in terms of security, scalability and maintainability.

Security

The above “Natively Secure” category is more about the mindset of how the operating system is developed and maintained, but also drives this Security Category.

Chrome and the Chrome Device Management (CDM) Console win again, for the reasons mentioned under Chromebox Pros above.

Operating System Support for Kiosk Mode

By “Kiosk Mode,” we mean:

Can the device be configured from an administrative perspective to boot into the digital signage application—and only the digital signage application—protecting it from misuse for other applications?

Chrome OS wins from a general purpose computing device perspective over Windows/Mac. As for the proprietary units, they come in a three-way tie for first as they are dedicated digital signage devices.

Resolution

Display resolution (and screen size) will always get better.

1080p is today’s norm and 4k is already making inroads.

It’s important that the player be able to play in a resolution appropriate for general purpose digital signage applications across the wide variety of available displays, and right now that means 1080p.

The Mac wins here as it already natively supports both 1080p and 4k in the base unit.
CPU / Processing Capability
All of the players implement CPU/GPU combinations enabling them to successfully support complex content requirements — full motion video and animation, crisp and clear.

Included Connectivity
The Chromebox and Mac Mini tie for the win here as they both provide WiFi, Bluetooth and Ethernet connectivity in their base unit.

The Chromebit is hindered by its small size and therefore does not provide an ethernet port but it does also include Bluetooth where the remaining devices do not. On the downside there is no clock, which can cause problems if the sign loses internet connection and can’t reboot it’s playlist schedule correctly.

In other words, it’s what keeps your digital signage from becoming a massive headache.

This is another category where Chrome devices win across the board.

The Chrome Management Console provided by Google means that you can remotely manage one device through policy management and those policies can automatically be pushed to thousands of devices.

There’s not a limit to how many you can include.

Statistics on player operation, remote reset, remote screenshots, it’s all there.

Cisco is a close second because of its robust network management lineage.

Green Tech
Do the reviewed devices represent an opportunity to reduce power utilization as a result of how they are built?

Just measuring the size of the included power supplies makes it easy to assess. Cisco, the Black Box, and the Chrome devices are the most green.

Form Factor
How easy is it to physically hide the player/device?

Form factor helps to determine and can limit the aesthetics of your sign.

Ever see a really high-end digital sign on an expensive, impressive stand with a large tower computer standing next to it? It kind of ruins the brand impression.

Smaller is better and from that perspective the Chromebit cannot be beaten as it can fit easily in a pocket.

Next best are the Mac Mini and the Chromebox.

Price Point
There is a 10:1 difference between the least and most expensive devices reviewed.

However, price shouldn’t be your sole deciding factor. In fact, it can be like comparing apples to oranges.

A SMB-friendly solution like a Chromebit will naturally be far less expensive than a top-of-the-line commercial media player box meant for enterprise use.

Understand what features are important to your use case first, and then look at the price of options that offer those features.

Chrome represents the least expensive of the reviewed solutions and leads at that price point from a feature/function comparison too.

What’s Your Goal?
All of these reviewed devices are effective digital signage media players.

Some have been around awhile, others are new to the market. Some are dedicated to digital signage, others are general purpose computing devices cast into application-specific roles.

Evaluate your solution from the perspective of your unique application requirements, and your organization’s ability to support the player devices themselves.

Here are some questions to consider when making your purchase:
Chapter 5: Digital Signage Hardware: What to Look for

- Are you deploying one or hundreds/thousands of devices?
- Where do you spend most of the time managing the player/device itself? Is it the operating system of the player (patching, etc.) or more digital signage application-focused?
- How easily and well does this player management process integrate with the digital signage application?
- How does the player management process integrate with your existing support infrastructure?
- Can you control the display (e.g. input) remotely through the player or do you have to be physically at the display with a remote control?
- Can the player use standard off-the-shelf components to enhance its capabilities or are they proprietary?
- How powerful a processor will you need, based on what type of content you'll be playing? Players with more powerful processors frequently cost more, so choose appropriately.
  - 1.8GHz Rockchip: A lightweight processor of the sort found in Chromebits. Good for simple content.
  - Intel Celeron: Good for standard digital signage content, and WiFi and Wired networking.
  - Intel Core i3/i7: The heavy hitter, which can play 4k video, streaming video, multi-zoned video, and more.

If you're deploying 1,500 digital signs, you don't want 1,500 IT problems.

Which device works best for your digital signage deployment? Can you do better for the given cost?

Chrome-based devices, given their price point, operating cost and remote management/support capabilities, are very hard to beat as general purpose digital signage players, be it a one-unit deployment or a network of thousands of digital signs.

Displays

When it comes to screens, there's a surprising number of options available, each with its own strengths and weaknesses. Here's a quick breakdown.

LCD

LCD screens are a digital signage workhorse.

More affordable than LED screens, lighter than plasma screens, and available in sizes up to 95” and with resolutions up to 4K, they're versatile.

If you’re going to have a digital sign where viewers will be up close and personal, you probably want to go with an LCD screen.

However, they are limited in their brightness output, contrast, and viewing angles.

Bear in mind, too, that the protective glass layer on the LCD screen is quite reflective and can create a mirror effect. This can be an issue in certain lighting conditions, making the content hard to read.

It is important to note that if you use fluorescent lights, most companies use specific cases for their screens to counteract light, dust, and vandalism.

LED

Light-emitting diode (LED) screens are a popular option for numerous applications.

Where these incredibly bright signs were primarily used outdoors at large sporting events or other venues, the screens are now popping up indoors as a big trend.
There are a variety of reasons for that.

- Because LED is flexible, it can adhere to any screen ratio or size, flexing around pillars or other unusual shapes. For very large screens, it's a great option.

- There are some advantages to using a high-resolution LED display compared to a projection or liquid crystal display (LCD) in large video wall-type applications. LED can display superior images without bezel distraction or ambient light adjustment.

- Because LED's don't wash out colors like fluorescent lights do, this makes the LED option perfect for indoor displays and retail applications. This is good news for retailers, especially now that LED offers incredibly rich colors.

- Contrast levels have improved too, thanks to the ability to dim individual LEDs to lower light output levels. Having said all of this, LED may not always match the precise Pantone of your artwork, so is probably not the best use for food service.

**OLED**

OLED stands for Organic light-emitting diode. These contain thin flexible sheets of an organic electroluminescent material, and are used for visual displays.

This fancy newcomer offers infinite contrast (since individual pixels can be turned on and off), potentially very high resolutions, low weight, and high energy efficiency.

Because they don’t require a backlight, they’re incredibly thin.

However, for now, they’re relatively expensive—as the technology develops, costs will go down.

**Projection**

A projected display is appealing for many reasons.

A single projector will be much less expensive than a very large screen or video wall. (Not to mention seamless!) They also have a high brightness output: up to 50K lumens. High resolution options exist.

The main drawbacks: Limited interactivity and the need for a flat, white projection surface.

Plus, they need to adjust to ambient light to produce a perfect image.

And, in fact, type of screen is far from the only factor at play. Below are some others to consider.

**A quick note:**

Many OEMs focus on different verticals, making screens specialized for particular environments.

For example, one meant to be used at an outdoor bus stop would have sturdy gorilla glass to prevent vandalism, high heat tolerance, and extra brightness to counteract the ambient light.

Because there are hundreds of options out there, it may be best to simply ask a trusted partner to recommend one to you.

The questions we discuss below will help you define your needs more accurately to that partner.

**Indoor, Semi-Outdoor, or Outdoor?**

As we mentioned in Chapter 1, indoor, semi-outdoor, and outdoor screens are very different from one another, each with special technology specific to its intended environment.

Indoor screens might have dust-repellent encasing, a scratch-proof screen, and a robust cooling system. However, the screen wouldn’t need to be quite as sturdy and robust as an outdoor screen.

**Which Is Right For Me?**

While I’d say LCD is probably the best all-around choice, there’s no one-size-fits-all solution.

It’s all about what works best for you.
A semi-outdoor screen is indoors, but still exposed to direct/indirect sunlight. The LED semi-outdoor screens usually produce less light because there’s natural light in the room.

It’ll also have sensors that will tell the screen to adjust its brightness as lighting conditions change through the day.

Outdoor screens are common in the retail and QSR verticals.

Need an example? Drive-through menus and have special casing and specifications on how much light is omitted so you can still read it in direct sunlight. They have powerful cooling systems, and can continue working in extreme heat, cold, wind, and so on.

The more extreme the conditions, the more specialized and thus expensive your outdoor sign will need to be. There’s a lot more environmental stress in Alaska or Arizona than in Indiana.

**Commercial or Consumer Display?**

A screen that’s left on for long periods of time is prone to the aforementioned burn-in, not to mention overheating. And in retail and QSRs, screens are often left on 24 hours a day.

A typical consumer screen—one you’d just pick up at a Big Box store—might not last long in a commercial setting, because they’re meant to be used only for a few hours at a time.

And even in your home, they’re not expected to last more than a few years.

They’re made with less expensive and hardy components. Plus, using a consumer display commercially might void its warranty. Finally, they aren’t designed to work in portrait orientation, which is commonly used in menu boards at QSRs, for example.

Commercial screens may appear to be more expensive if looking just at MSRP, but when taking into account Total Cost of Ownership a different story is told.

**TOTAL COST OF OWNERSHIP**

(4 to 8 year of expected operation of the panels)

When comparing consumer TV pricing to Commercial Display pricing be sure to look at:

- Difference is scalability and functionality (consumer TVs have limitations)
- Look at Power Consumption Costs.
- Replacement cost of Hardware in Consumer vs. Commercial Displays.
- Difference in Warranty,
- Difference in hours per day usage. 6 hours for a TV, 12 to 24/7 for commercial displays
- Understand that: All flat-panel display models are not created equal

A single replacement of a consumer quality display panel can increase its cost over the commercial grade panel, and operational economies may be sacrificed since commercial-use features are typically not included in home-use TVs.

**CONSUMER TVs:**

1. Consumer (in-home) TVs are produced for a two- to four-year life operating four to six hours per day (depending on the brand),

2. Warranties reflecting this ruggedness are typically for one year on the consumer TV

3. Consumer TVs are not designed to operate in portrait mode and they usually lack the inputs and display controls that maximize the return on the digital-signage investment.

Consumer quality TVs are not suitable in dirty, hot or humid environments and are a false economy over using commercial-grade flat panel displays.

**COMMERCIAL DISPLAYS:**

1. Commercial-grade flat panels are engineered for 60,000+ duty hours, (18 hours of operation for 365 days equals 6,570 hours of operation per year).

2. Commercial grade warranties are three to five years on the digital-signage display.
3. Display OEMs typically use commercial-grade components that are designed to prolong the life of the display where heat, dust and humidity are elements of the display environment.

Conformal coating is a thin protective chemical coating or polymer film that is topically applied to circuit boards to protect electronic circuits from harsh environments. When applied, this breathing coating “conforms” to the circuit assembly, filtering water vapor and solid debris.

LED lighting and commercial-grade components can be effectively cooled using convection, typically negating the need for supplemental fan cooling.

Fanless flat panel operations reduce noise and energy requirements while pulling less contaminated air into the workings of the display device.

But don’t stop reading there!

They’re designed to disperse heat properly (whether oriented vertically or horizontally). They also have built-in anti-burn-in measures, though many consumer displays do as well.

Thanks to features like anti-glare glass and ambient light sensors that adjust brightness automatically, they should also be more readable.

They also have other features, such as control locking, ability to recognize more resolutions and refresh rates, better contrast, and more connector options.

Not every application requires a commercial-quality display, but between the longer lifespan and the warranty, plus the added utility, it may pay for itself.

How Should the Picture Look?

Your beautiful content will be even more eye-catching on a screen that’s optimized to display it.

And different types of content and uses have different screen property requirements that’ll help them look their best.

There’s some key terms you need to know.

◊ **Pixel pitch**: Pixel pitch refers to the distance between pixels. A small number indicates a high density of pixels, and thus the ability to produce a sharper image.[78]

◊ **Display resolution**: Resolution refers to the total pixels in the screen, and is expressed in terms of horizontal pixels x vertical pixels. For example, 1920 × 1080, which is sometimes referred to just as 1080. Or 4K, which is shorthand for a horizontal resolution of about 4000 pixels. While it doesn’t tell you pixel density, it lets you know how many pixels they are and how they’re arranged. Content that matches the display’s native resolution will look best. So, while 4K is trendy, unless your content matches that high resolution, it won’t do you much good.[79]

◊ **Aspect ratio**: Aspect ratio is tied to display resolution. It refers to the ratio between a screen’s width and height. A 1920 × 1080 screen would have an aspect ratio of 16:9. If the aspect ratios of your screen and content don’t match, the image may end up squished, stretched, or surrounded by black gaps.

◊ **Brightness**: Brightness just refers to the light output of a screen. In digital signage, it’s measured in nits.

◊ **Contrast rating**: A high brightness contrast between white and black regions on the screen lends depth to images. In general, a contrast rating of at least 20:1, even in full light, is desirable.

◊ **Frame rate**: Frame rate refers to how often your screen can display consecutive images, or frames, and is typically measured in frames per second (FPS).[80]. The higher the frame rate, the smoother on-screen motion looks. The screen can update the image one pixel row at a time so that the entire screen gets refreshed at once (progressive scanning) or by updating first even rows and then odd so that the entire screen gets refreshed every two frames (interlaced scanning).[81].
Color gamut: This term refers to the range of colors the screen can show. While it sounds like a higher gamut would be better, it all depends on your content. The color gamut of the screen should match the standard color gamut of the content, called sRGB. Any higher and you get unrealistic, oversaturated colors. Related: the ambient light affects how the colors on the screen look, and some displays are optimized to look best under, say, fluorescent light.

Your needs for all of these will be determined by your use case: the lighting conditions, size of the screen, viewing distance, and type of content, among others. For example, envision a vehicle showroom (surrounded by windows) with kiosks that let customers learn more about the products.

The screens would need a high resolution and refresh rate so that videos of the cars can play without blur and highlight all those design subtleties. Plus, the images would need to look good in bright, natural light.

If you can spell your use case out for the OEM or the digital signage partner you’re working with, they should be able to direct you to the right screen.

How Should the Screen Look?
Depending on your vertical and use, the aesthetics of the screen itself might be important.

Size
Screen size will be closely related to and limited by your choice of screen type. Flat panels (that is, non-projection options) rapidly become more expensive above 55”. This might indicate that a projector might be a wise choice.

The screen should be large enough to display the necessary information in a way that will be legible at the distance your viewers will be positioned at.

With an LCD screen, use the 4/6/8 rule.

That means that viewers can be four times the image height away in order to process complex information, six times to view simple information, and eight times for casual perusal.

With LED, take the pixel pitch and multiply by 1000 to find the minimum viewing distance—that is, the distance at which the image stops looking good. Think about a pointillist paintings: what looks like a pleasant riverside scene from a distance looks more like a mess of dots up close. For maximum viewing distance, the 4/6/8 rule applies.

No analytical method yet exists for finding the minimum viewing distance for a projected image, but it looks like one’s on the way.

Bezel
The bezel is the plastic or metal rim around the screen.

You may wish to have an unobtrusive bezel for aesthetic reasons.

If there are many displays next to each other, such as with a video wall in a retail setting, you want a thin bezel so it doesn’t cut words in half if content is stretched across multiple screens.

Mounts
Choosing a mount is all about finding one that fits your budget and positions your screen the way you want. It’s much more straightforward than picking a screen or media player.

Here are the most common options.

Basic Mounts

- **Flush:** The simplest type of mount. These position your screen on the wall so its back is parallel to the wall. You might find these in hallways or behind a welcome desk.

- **Tilt:** This type mounts your screen at an angle. It might be useful if your screen is located above eye level, such as with a digital menu board.

- **Articulating:** Articulating mounts place a screen at the end of an arm so the angle and direction it’s facing can be changed.
◊ **Ceiling:** Rather than hanging from the wall, some screens dangle from above thanks to ceiling mounts. I’ve encountered them at airports—at the gates, there are often ceiling-mounted TVs playing the news.

◊ **Pedestal:** Pedestal mounts rise from the floor. In a large space with walls that are far away, and especially with interactive screens, these can be practical.

**Kiosks and Other Specialty Mounts**

Kiosks enclose screens within a casing for aesthetic appeal, to protect from vandalism and other environmental factors, or to make them easier to interact with.

They often cost more than basic mounts and may be built out of premium materials to provide visual appeal and greater protection for the hardware inside.

They’re as diverse in forms and sizes as basic mounts, and tend to be designed for specific purposes.

Often, the screen and the enclosure come as a “package deal,” but sometimes they can be purchased separately.

There are other types of specialized mounts.

Some kiosks may have additional components built in, such as a camera, card reader, or infrared sensor.

Others may be built with specialty materials to fit the setting they’ll be placed in—for example, antibacterial plastic at a hospital.

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BUYER’S GUIDE
Digital Signage
Hardware

Each digital signage system needs three major hardware components:

◊ Media Player
◊ Screen
◊ Mount

Media Player
Here are some questions to consider when making your media player purchase, because if you’re deploying 1,500 digital signs, you don’t want 1,500 IT problems:

◊ Are you deploying one or hundreds/thousands of devices?
◊ Where do you spend most of the time managing the player/device itself? Is it the operating system of the player (patching, etc.) or more digital signage application-focused?
◊ How easily and well does this player management process integrate with the digital signage application?
◊ How does the player management process integrate with your existing support infrastructure?
◊ Can you control the display (e.g. input) remotely through the player or do you have to be physically at the display with a remote control?
◊ Can the player use standard off-the-shelf components to enhance its capabilities or are they proprietary?
Screen

Short answer is that your digital signage partner or the OEM will be able to recommend a great screen for your specific requirements, especially since there are so many variables to take into consideration.

But, before you talk with them, here are a few terms you might want to know:

- **Pixel pitch**: Pixel pitch refers to the distance between pixels. A small number indicates a high density of pixels, and thus the ability to produce a sharper image.

- **Display resolution**: Resolution refers to the total pixels in the screen, and is expressed in terms of horizontal pixels x vertical pixels. For example, 1920 × 1080, which is sometimes referred to just as 1080. Or 4K, which is shorthand for a horizontal resolution of about 4000 pixels. While it doesn’t tell you pixel density, it lets you know how many pixels they are and how they’re arranged. **Content that matches the display’s native resolution will look best.** So, while 4K is trendy, unless your content matches that high resolution, it won’t do you much good.

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- **Pedestal**: Pedestal mounts rise from the floor. In a large space with walls that are far away, and especially with interactive screens, these can be practical.

For specialized mounts (like kiosks, interactive displays, etc…) talk to your digital signage partner or OEM about your customizable options and what you need for your specific use case.
Cloud-Based Digital Signage
Cloud-Based Digital Signage

We all know that the cloud is tremendously valuable in our everyday lives. Most of us have smartphones that automatically back up our photos in a cloud, and many make use of services such as Dropbox or Google Drive.

If I ever have my phone swiped by an overly curious seal at an aquarium, I can rest assured that the picture I’d just taken of said seal balancing a ball on its snout is safely in the cloud.

And it’s not just consumers who love the cloud. In fact, as of 2016, 95 percent of IT companies make use of cloud services[84].

At the enterprise level, more and more companies are coming to depend on public clouds to handle their computing workload, with 17 percent running over 1000 virtual machines in the cloud (up 4 percent since 2015).

But did you realize that the cloud also has tremendous implications for digital signage?

Digital signage has been around for a long time. The cloud didn’t exist when digital signage began, so these companies relied on local area networks, hosted on on-site servers.

The issue within this concept is that every time technology would change, businesses had to invest in new hardware and software. That is, until cloud-based digital signage came along, promising a radical new model of device and content management and collaboration.

Keep in mind... not all clouds are created equally. It is important that end-users investigate security, scalability and speed.

Even today, some cling to on-premise software claim that it’s more secure, can update content faster, and is cheaper than the cloud-based digital signage Software as a Service model [84].

In this chapter, we’ll explore whether those claims hold water, explain exactly what cloud-based and on-premise digital signage mean, and ask whether the cloud is right for you. Get you PDF here.

Understanding Cloud-Based Digital Signage

Note: We’re focusing on public cloud services, rather than private cloud solutions. Private clouds are on-premise solutions.

Cloud-based digital signage software is an “invisible” solution. Someone else takes care of the behind-the-scenes work for you.

Want to see how it works?

A cloud service provider owns a large server farm.

You may be provided with a predetermined amount of storage space such as 30GB (for example) for
Chapter 6: Cloud-Based Digital Signage

no charge from your CMS provider, or pay a monthly or yearly subscription fee for space on those servers, the software necessary to stream your content to your digital signage, and so on.

Having to pay a monthly or annual fee for use of software is known as the Software as a Service (SaaS) model—you don’t own the software outright.

Depending on your provider and which options they offer, you might purchase hardware that’s preloaded with the necessary software to create and stream your content, or you might just pay to license software and load it onto your own hardware, or a combination of the two where a nugget is on the device and it calls home for setup.

Your digital signage network’s content is hosted on and streamed via the Internet from that offsite server farm.

Pros
We’ll take a deeper dive into the pros in the “Top 8 Reasons Why Cloud-Based Digital Signage Is Right for You” section below. Trust me, there’s a lot of them! This section is just a quick comparison to on-prem solutions.

The System Isn’t Dependent on One Computer
Because it is a cloud-based solution, the user doesn’t need to rely on a computer (or system of servers) in the back room for their digital signage campaign to function.

This is ideal for most companies because cloud-based solutions perform automatic software updates, support, and ensures the IT team doesn’t have maintenance issues.

Enterprises and SMBs love this convenience and peace of mind, and of course not worrying about internal IT resources. 24 percent of SMBs surveyed running all of their cloud computing on public clouds (versus on-premise)\(^{94}\).

A Back-Up System Keeps You in Business
Most cloud-based software is designed to cache the content on the media player\(^{85}\).

Caching means that new content is downloaded to and stored on your media player at regular intervals, ready for playback. This means if there is an interruption in the Internet connection, the cached playlist will load and play a back of the content seamlessly.

It also means that the content isn’t continuously streamed from the Internet, meaning you save bandwidth.

Cons
Content Doesn’t Update During an Internet Outage
If there is an outage, the currently scheduled content will continue playing.

Here’s the catch.

Any content that has been updated via the cloud won’t update on related kiosks or commercial grade screens until the Internet comes back up.

As soon as the Internet comes back, any new content will appear.

Regardless, the lag time of missing “new” content is an issue for some. If so, these end-users may choose to manually push content via USB if the internet is going to be down for any period of time.

Take Caution of On-Prem Scams
True end-to-end cloud-based digital signage has some great advantages.

But are you sure that’s what you’re paying for? Or have you been taken in by cloud-washing?

Cloud-washing is when vendors take a solution meant to run on-premise and hand it over to a local value-added reseller (VAR), who runs it on their servers. I.e. a Private Server, not well-known public servers such as Google or Amazon Web Services (AWS).

The vendor doesn’t host or maintain the solution. When you subscribe to it, it’s more like you’re just tapping into an on-premise solution hosted by someone else.

But the vendor still calls it a cloud-based solution—tricking you into an inferior cloud service.

Trust me, it’s a real problem:

83 percent of surveyed companies expressed frustration with having to wade through the fine print on cloud solutions to find out whether they’re even actually cloud solutions\(^{86}\).

\(^{94}\)Chapter 6: Cloud-Based Digital Signage

\(^{96}\)Chapter 6: Cloud-Based Digital Signage
Why Does It Matter?
Here’s just a few reasons.

◊ **Decreased security:** Does the local VAR have properly robust security measures in place? Probably not—most are stretched thin on resources already.

◊ **Painful updates:** Because the VAR is a middle-man between you and the vendor, software updates may take months to reach you (if they even reach you at all!) Frequently VARs allow server updates to become far out of date in favor of “if it ain’t broke don’t fix it.” This leaves gaping security holes in the solution (not exactly what you want in the system controlling what content is displaying on your signs!) Since all customers aren’t hosted in the same place, they’ll have to be issued updates one at a time. You may even be charged for updates and upgrades, and have to wrestle with compatibility issues on your own or pay for a consultant to come in.

◊ **Lowered product quality:** This is the big one. Falling for cloud-washing means wrestling with compatibility problems, struggling to customize your use, and potential server down-time.

◊ **Increased costs:** Instead of subscribing to both the software and the hosting from one source, you’re basically paying for them separately. Bringing in a middle-man means higher costs for you. Not only that, but instead of the service being scalable and you only paying for what you need, you’ll have to buy extra software licenses in case your needed capacity increases. What a waste!

How Do You Spot It?
Unfortunately, unless you’re going with a true giant of cloud computing, it can be tricky to spot a fake cloud at first glance.

But with a closer look, and a few strategic questions, you can find out the truth. Here’s what to ask.

**Do they meet the definition of cloud service?** According to the US National Institute of Standards and Technology (NIST), at the simplest, cloud services should be on-demand and self-service, and scalable/elastic[^87].

**What security measures do they offer?** For many companies, their content needs to be secure because the information being shared is for “eyes-only” (e.g. employee engagement, KPIs, and other internal numbers). Ensure the CMS transmits your information in an encrypted format when you load into the CMS, it’s stored in an encrypted format, if moved between data centers then it’s encrypted in transit. If security is a concern for you, then make sure that when your content is cached on the media player, it’s encrypted.

**What’s their stance on multi-tenancy?** Multi-tenancy is an essential component of cloud computing. It means that all companies using the provider’s product are served from the same cloud.

This saves costs, because it allows maintenance to occur all at once, and assures that all customers access the same product[^88].

Some cloud washers try to claim that multi-tenancy weakens the product, but in the end, that’s an excuse, and simply not true. If multi-tenancy is good enough for Google, it’s good enough for you.

**Can you customize the service?** On your end, you should be able to develop custom applications without paying for expensive consultations. You should also be able to integrate the cloud solution with other applications and web-services[^89].

Of businesses surveyed, 13 percent ran apps on one of Google’s cloud services, but with the company’s support for digital signage apps and its kiosk mode (which we’ll talk more about in chapter 7), it’s looking like an even more attractive option for those wishing to use the cloud for digital signage.
Furthermore, you should have the guarantee that when the software updates, it won’t stop working with the other solutions you’ve integrated it with.

**Who Uses It?**

There are very few situations when cloud digital signage isn’t a viable solution.

Think very simple, single location digital signage that has limited updates or changes, where it would be more cost effective to just update content by hand or to use freeware rather than paying a monthly subscription fee.

Of course, in that situation, an on-premise solution complete with servers would be too expensive as well. And what if someday you decided to expand your digital signage? You’d long for the scalability the cloud provides.

Think about how the cloud could work for you, too.

**Use-Case: Automotive Broadcasting Network**

The Automotive Broadcasting Network (ABN) is a company that provides auto dealerships with targeted, customized TV programming designed to engage customers and show off car products.

In 2015, they decided to expand beyond the waiting room and start offering content for other areas of the dealership—for example, digital menu boards at the parts counter (with parts lists, prices, and details), or displays showing cars in action in the showrooms.

Because they provide custom content to dealerships across the United States, on-premise signage just wouldn’t cut it.

The cloud allows them to deliver that content seamlessly to more than 1,200 displays across 42 states.

Multiple customers reported that their new digital signage led to marked increases in sales.

**Understanding On-Premise Digital Signage**

A hosted digital signage content management system also delivers content to players (like kiosks or touchscreens), only it’s delivered from an on-site server that is hosted and maintained by your company.

Content may be delivered via the Internet, or, more likely, by your own network.

This delivery isn’t able to stream your content to several remote players, unless they are fairly close to your on-site server.

Are you spotting some limitations already?

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**Pros**

**You Don’t Need an Internet Connection**

On-premise software is operated locally.

That’s right. You don’t have to rely on an internet connection to keep your content moving.

If the Internet signal is somehow disrupted, your content will still show up because you’re not using the Internet to begin with.

**With cloud-based signage, an Internet signal is needed to download new content onto media players.**

If your digital signage relies on real-time data and instant updates, or if you live in an area where your Internet connection is unreliable, on-premise might be your best pick... or at least having a cloud-based solution that caches content to the media player.

**Potentially Increased Security**

As we’ll talk about in #6 below, cloud-based signage has more-than-sufficient security protocols for most purposes.

The companies who host your data and run your software will use encryption to protect your content, plus offer regular security patches and bug fixes as vulnerabilities come to light.
Furthermore: It’s highly unlikely that your network is more secure than the public cloud giants.

However, if your digital signage system isn’t connected to the Internet at all, but is instead entirely hosted locally and streamed through cables, on-premise digital signage could be more secure. Someone would actually have to physically come into your location and intercept the signal to steal your data.

While this kind of setup would have disadvantages of its own, since you yourself would have to be physically present to make changes in content or scheduling, in situations requiring extreme security it could be worth it.

You Own It
Cloud-based digital signage typically relies on a Software as a Service model.

That means that rather than owning the software, you subscribe to it, often on a monthly basis. Depending on your provider and your own needs, you may also rent some of your hardware from them.

That’s not the case with on-premise digital signage.

Once you purchase your hardware and software, it’s yours. No monthly fees.

Do you like the sound of that? You might hope that after your up-front investment, with time, you may have net savings over what you’d pay for cloud-based signage.

But... Notice that I don’t say there are no expenses. Read on to find out what they are.

Cons
Different Recurring Expenses
While you aren’t paying a monthly subscription, that also means you aren’t getting some of the subscription benefits.

Your software won’t update automatically. You’ll have to download and install updates yourself. And if a new version comes out, you’ll have to buy it—or continue using old software, which may develop security vulnerabilities.

As your servers age, you’ll have to maintain and ultimately replace them. You can weigh those costs on your own, and for some people, completely owning their digital signage system is worth it anyway.

There is No Technical Support
Are you certifiably “tech-savvy?” If not, this one could be a real trouble spot.

Unlike subscribing to a cloud-based system, there’s no tech support with on-premise.

If your software needs updating or your hardware starts acting wacky, you could be at a loss.

Unless you have a robust IT team, this could be a factor that makes or breaks your decision to host on-site.

You may be able to turn to the company from whom you purchased your software or hardware for help, but given that intense support will be needed, there will likely be a cost associated.

More Up-Front Costs
Hosting your own digital signage content incurs more upfront costs.

If you were to go the old-school route (locally hosted), you’d have to pay for any hardware up front, and that could put an unexpected dent in your wallet.

Not to mention ongoing software updates on every device across your organization. That means paying for more man-hours of maintenance.

If your company isn’t already experienced at maintaining its own servers, you may need to hire an additional FTE IT support member who does have that expertise.

And that’s in addition to the Content Champion/Manager and graphic designer you may also be hiring for your digital signage content needs.

If a business prefers to capitalize expenses, that may move this out of the Cons category and into the Pros category.

Limited Growth
As we’ve mentioned, once you purchase the necessary components, they’re yours.

Here’s the problem. That can be limiting.

Let’s look at an example.
Your digital signage is a hit and you want to expand from ten signs to fifty. Can your servers support that number of signs?

It’s up to you to find out... and then purchase, install, and troubleshoot additional servers if necessary.

Is your software only licensed for a certain number of screens or locations? If so, you may have to purchase additional copies, which may end up being different versions than the one you’ve been using, depending on how long it’s been since the original purchase.

And you can pretty much forget expanding your network to more than one location.

Unlike a cloud-based network, where content is managed centrally from the CMS, there’s no easy way to share content between locations, or share some content and localize other elements.

Who Uses It?

On-premise digital signage is most often used for highly customized, highly integrated applications; in situations when extremely high levels of security is desirable; or in situations when a single location has only a few signs.

Use-Case: Elizabeth Forward School District

For our example, let’s turn to a small six-school district located near Pittsburgh.

The district wanted to share important announcements and showcase student projects in a vivid, dynamic way. They turned to digital signage to replace their outdated system of connecting laptops up to LCD players.

After their IT department spoke with several companies, they settled on a simple on-premise solution involving media players and Apple laptops that connect to a local area network (LAN) at each school.

The digital signage company also collaborated with the school district to create usable and attractive templates for content creation.

It took six months to implement the digital signage at the trial school.

The district said it’s pleased with the solution and that parents love seeing their children’s projects on display.

1. The size of your business.
2. The type of campaign you want to launch.
3. The message you’re trying to convey.

For agencies like the NSA, or a company that legally requires security in-house without a public cloud ever touching the data, an on-premise solution with specialized internal security measures would be the best option.

However, if it’s content for customers and it includes some sort of customer interaction, or is corporate communications meant to be sent to many locations, cloud-based is almost always the best fit.

Coming up next are eight more reasons why cloud-based digital signage could be your new best friend.

Cost and Return on Investment are often key drivers when users make a final decision. If up-front costs for on-premise aren’t available, a cloud-based solution might be the best option.

And make sure you ask enough questions of your software provider so that you have a full understanding of the product you’re investing in.

Which Triumphs?

Like all other aspects of digital signage, this question comes down to which one’s right for you.

These are the three big factors you need to look at when you’re deciding on a solution.
Chapter 6: Cloud-Based Digital Signage

The Top 8 Reasons Why Cloud-Based Digital Signage Is Right for You

1. Rapid Delivery of Content

When it comes to distributing content across locations—whether it’s two locations or two hundred—cloud-hosted content gets there fast.

Any user who has access can change or add content at any time, which will be nearly instantly sent out to all locations.

That means you have a way to quickly correct errors, such as a typo, pricing error, or listing of an item that is no longer in stock.

With traditional printed signage, these problems would have to be corrected by fixing price labels by hand, reprinting posters, and other laborious and expensive means.

Even with other methods of doing digital signage, getting updated information out to multiple locations might be complicated or take longer than... well, mere moments.

This also means you have incentive and opportunity to innovate. By lowering the costs associated with a flopped ad or other minor piece of content, you can afford to take risks.

Producing more content more quickly means you’ll fail more often—and also learn more quickly from those mistakes, and ultimately succeed more often.

2. Cost Efficiency

Cloud-based digital signage really starts to distinguish itself over on-premise digital signage in the area of cost efficiency.

37 percent of respondents said the cloud saved them money over their previous solution.

With on-premise digital signage, you’ll be facing some nasty surprise expenses.

If you want to host your own digital signage network, you’ll need to purchase and set up your own server system, complete with meters upon meters of cabling, along with the necessary heating and cooling equipment to keep it running.

You’ll need to pay your IT people to run and maintain the servers.

Any time you want to update or upgrade your servers, or update the software you’re using to stream your content, you’ll need to do it manually and at your own expense.

On-premise signage is a major up-front money and time commitment that many SMBs, in particular, might not be prepared to take on.

With cloud-based digital signage, the upfront cost is relatively low. In fact, some providers will provide you a free short term trial period so you can decide whether to commit to the service.

Service is the key word there. As mentioned, you’re paying a single subscription fee to use the provider’s servers, have them stream your content to you, rent hardware (if applicable), access 24/7 help lines, and license the requisite software.

Furthermore, your own IT department isn’t responsible for keeping the servers running: your service provider is.

Still, some (26 percent of respondents) are concerned about cloud operating cost management.

Luckily, there are simple measures for minimizing cloud costs, like monitoring your usage and using that information to rightszie the instances you pay for. Only 45 percent of enterprises and SMBs take that step, though it’s an opportunity for big savings.

Also consider shutting down workloads during times they aren’t needed, a savings measure 33 percent of enterprises use.

And, bonus, if your service fees are charged on a metered basis, you are only charged for what you use.

3. Scalability

Start small... and dream big.

Cloud-based digital signage can support you whether you want to have simple slideshows running on a single screen, or stream full HD video to a thousand screens.
In fact, budget allowing, there's no reason you can’t start with the first and eventually transition to the second.

Your provider will allow you to pay for additional bandwidth and storage space as your needs grow.

Scalability is one of the biggest advantages the cloud has to offer, with 58 percent of survey respondents saying the cloud has given them greater scalability compared to previous solutions\(^{[94]}\).

And unlike onsite options, expanding your network won’t mean sending the IT crew into a panic as they update and install more servers.

Whether you have one screen in one location, or 500 spread all across the United States, you’ll be able to manage it all from your CMS. (See Chapter 4 for more information about that.)

Reputable cloud service providers also handle auto-scaling and load balancing of bandwidth so that as you add more screens and content, you won’t experience crashes or data bottlenecks.

4. Easy Implementation

Time is money, and cloud digital signage is a deal.

You already learned how it saves you money (\#2). Here’s how it saves you time.

Getting your system running might be as simple as installing a screen preloaded with the required software and hardware, connecting to the Internet, creating your content, and letting streaming begin.

52 percent of survey respondents were psyched about the cloud’s fast time to market compared to other options\(^{[94]}\).

Depending on the company you go with, most interfaces are template-based, making it easy to drag and drop images, choose fonts, and create powerful content in no time.

Other interfaces allow you to continue using the platform you build in now. Those interfaces simply import what you’ve created and fire it off to your monitors and kiosks.

This means you can continue to use PowerPoint, Adobe Illustrator or any other program you’re comfortable with.

There is no special training to learn how to use the software, nor do users drown in technical terms as they create.

Pretty neat, huh?

And with the right team, plus the good support mentioned in \#5, questions can be answered and concerns addressed by experts who know what they’re doing.

Even with larger systems, it won’t be as complicated a task as setting up your own servers.

This will free your employees to spend time focusing on your company’s core competencies, rather than struggling with a system they have a difficult time understanding, increasing your efficiency.

5. Good Support

If you have a good service provider, they’ll be dedicated to helping your experience go smoothly.

They’ll provide free software updates whenever those become available, which should download automatically to your digital signage network.

You can even set up your account so downloads of content and updates occur at times of least demand for your network, so as not to overload your bandwidth.

They’ll be available for you to call or email any time an issue or question arises, and will work with you to resolve it quickly—because they’re providing you with a service, and it’s in their best interest to have happy customers.

They’ll also help allay some common fears. For example, what if the Internet connection goes down?

Well, we actually that one for you, under “Pros” up above.

If you have any similar questions, you can ask your provider!

What’s left for IT to do? When asked what the role of IT is when using cloud services, respondents mentioned choosing which apps to run on the cloud, advising which cloud service to choose, and setting policies for cloud use\(^{[34]}\).

6. Security

This is a somewhat debated point.
Some fear that by putting your data in the hands of a third party and streaming it over the Internet, you’re leaving it vulnerable to attack\textsuperscript{[84]}. In fact, 29 percent of survey respondents cited security worries as a challenge in cloud adoption\textsuperscript{[94]}.

Don’t worry yet!

Even here, cloud-based digital signage has certain advantages.

For one thing, your provider may, in fact, be able to provide higher levels of security than your company’s network can, especially if you’re a relatively small company\textsuperscript{[91]}.

They should stream using HTTPS, encrypting both the uplink and the downlink. Stored data will be encrypted and protected with firewalls as well.

For another, locating all of your digital signage-related data in one “place,” rather than spread out across multiple machines and locations, may help you reduce opportunities for leaks\textsuperscript{[82]}.

It’s not quite like storing all your information in a single vault, though: some advanced cloud storage companies use “cloud files”\textsuperscript{[85]} to keep different types of information separate—so a breach wouldn’t give hackers access to all of your data at once.

You’ll also have to do less security testing across sites.

Backup playlists are put in place so that any disruption in a connection can be thwarted.

\textbf{The cloud uses the same protocol as the World Wide Web—that very big space where millions of bank transactions are made securely and successfully every day}\textsuperscript{[85]}.

For example, a branch manager might be able to add content of his or her own, but not alter certain files that every location uses.

Or, one team member at the local level can be in charge of scheduling and downloading content.

\textbf{8. Data Collection}

Digital displays can do more than just show content.

With the Internet of Things showing up loud and proud, digital sign campaigns can also collect much-needed data. This collected data can be the catalyst that helps improve the ROI, all of which is stored in the cloud.

\textbf{Case in point:}

When big box stores prepare to order product, they need to know how much to order and when peak selling times are. Sometimes these peak selling times are affected by the weather and the seasons.

If the weather breaks and it is suddenly colder than usual, coats and space heaters may fly off the shelves faster than normal.

This trend is tracked and stored in the cloud, enabling retailers to be prepared for the same possibility the following year.
On the other end of the spectrum, if sales are slow and retailers end up with too much inventory, managers can review trends and create promotions to help move inventory.

By changing advertising to automatically sync with current inventory levels, retailers can avoid losing money on unused stock while offering different options and specials to customers.

To Sum Up...

Despite sounding like a wispy concept, cloud-based digital signage is actually a solid choice for many reasons. It even offers advantages over on-premise networks.

It’s a low-cost solution, especially at its basic tiers, compared to the difficulty and cost of purchasing, installing, and maintaining your own servers.

It’s easy to get started with and, thanks to good cloud service providers, easy to maintain, leaving your employees free to focus on other tasks.

It’s scalable—it can grow with you.

It’s secure. The provider encrypts your data, both while it’s stored and while it’s streaming; and you have total control over who can access the files and what kind of changes they can make.

In other words, rather than dampening your performance, pairing the cloud with your digital signage is sure to brighten your day.

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Which Digital Signage is Right for Your Business

Here are 5 attributes you need to consider before using a digital signage vendor. Use this PDF to ask questions as you evaluate and compare digital signage CMSs to find the one that fits best with your company and your goals.

1. Software Performance
   There are two things to consider when looking at the performance of a software:
   a. Can it meet the increasing demands of your customer?
   b. Will it successfully deliver reliable video, images and other media to your screen?

2. Network Performance and Delivery
   They say performance is everything and in the digital signage industry, this is certainly true.

   Why?
   Because if you have great software but a lousy network to carry it, you’ve essentially got nothing.

3. Advanced Performance
   If you want to incorporate live social news feeds, interactive media, or touchscreen capabilities, you need advanced performance software. The software’s ability to integrate with third-party data providers is key.

4. Customer Service Based
   When determining which digital software you plan on going with, consider a company where customer service is a priority. You’re likely to have a lot of questions that require thorough answers and explanation.

5. Cloud-Based or On-Premise
   It’s difficult to find a company that shouldn’t go with a cloud-based solution.

   Companies want software that updates automatically, requires no maintenance, offers support, and doesn’t need server racks in their back room. Most companies also look for digital signage software that has little to no learning curve, drag-and-drop capabilities, and offers different templates to work from.

   This also means they want to lessen the IT load, which would make the cloud-based software the best option for them.
Google Chrome for Digital Signage
Google Chrome for Digital Signage

Google has been making waves in the digital signage market for about two years. They’ve made it clear that Chrome is here.

The Google ecosystem has compelling hardware / media players available to run your digital signs. Chrome provides a platform for innovation.

Chrome-based digital signage solutions are by far the most secure, easy to manage, scalable, and easy to implement.

Here’s why: Digital signage through Chrome is a truly end-to-end cloud-based solution. Chrome takes care of it all.

Remember what I talked about in Chapter 6 about the dangers of the “fake cloud” and not updating new versions and security patches?

Chrome bypasses all those concerns that are very real for other platforms.

You can choose Chrome OS for your media players, manage those devices from the Chrome Management Console (CMC), and control your content using a CMS from one of Google’s partners.

All your software runs in the Cloud. All your data is stored there safely. Plus, you get to harness the cloud for collaboration.

And among their many product options, there’s solutions for everyone from SMBs to enterprises. In this chapter, I’m going to walk you through each of Google’s media players and give you a leg-up in deciding which is right for you. Get your PDF here.

The Hardware

The hardware required to complete a digital signage solution is typically a commercial-grade screen and a media player. There are lots of options out there for displays, which we explored in Chapter 5, but now it’s time to look at the media players.

There are also lots of options out there for media players, and for Google, that includes the Chromebit, Chromebase, and Chromebox. We’ll also enlighten you about Chromecast, but Chromecast is not recommended as a commercial-grade digital signage tool.

It can be confusing to determine which device you need if you’re considering Chrome for digital displays.

What’s the difference between the three? What are the pros and cons of each?

We’re about to end any confusion you might have regarding these three options, giving you clear definitions on what each does, how the hardware options can best serve you, and what the pros and cons are of each.
Chapter 7: Google Chrome for Digital Signage

Chromebox

You probably remember the Chromebox from Chapter 5, but we’re going to take another look and see how it measures up to other Chrome solutions.

The Chromebox, born in 2012, is a small form-factor computer box that runs on Chrome’s OS.

The idea is that you can set the box on your desk, plug in a screen, mouse, and keyboard, and set up your own little desktop computer... or skip the mouse and keyboard, plug it into a commercial-grade screen, and use Chrome’s kiosk mode to lock-down functionality and now you have a fully functioning digital sign.

How it Works

Chromeboxes primarily support a single application at a time.

They rely heavily on an Internet connection for software functionality and data storage. That connection, via a local area network, can be wireless or through an Ethernet port.

The user hooks up their Chromebox to the display via HDMI and connects to the Internet.

If the user subscribes to the Chrome Management Console, he or she can take a few seconds to enroll the device to allow it to be configured remotely.

After that, if working with a digital signage CMS (one of Google’s partners might be able to provide an attractive solution) once the player is connected to the network, the visual display shows the content.

The Chromebox syncs and locally caches the content (so it can still run if the connection is choppy).

Instead of tasking someone to code an application, it’s just a matter of using CMC and your preferred CMS to push the desired content to the appropriate devices.

Cost and Models

$159 – $675 (depending on model)

There’s not just one sort of Chromebox—in fact, there’s one to suit the needs of just about anyone.

That makes it a little tricky to sum up the Chromebox’s stats, since there are many models made by different companies.

Standard features include a 16 GB SSD, Wi-Fi, and Bluetooth 4.0, at least 4 USB ports, Ethernet, DisplayPort, HDMI, and an SD card reader.

Below, you’ll find a rundown of the offerings from a number of major original equipment manufacturers (OEMs).

Asus

Asus is known for consumer media players, but they perform well and are commonly found in commercial settings. Part of this is due to the small form factor, a compact 4.88 x 4.88 x 1.65”.

You can choose between several different processors: Intel® Celeron 2955U ($179 MSRP), i3-4010U ($369 MSRP) [96]. The i3 model comes with a keyboard and mouse.

Acer

Acer’s Chromebox CXI models are also aimed at the consumer market, with all-plastic casing and a noisy fan. They’re still solid products.

At 1.3 x 5.1 x 6.5”, it’s compact, though not the smallest. There’s options with processors and memory [97]. The CXI has a 1.4GHz Intel Celeron 2957U processor and a choice between 2GB ($179) and 4GB ($219) RAM.

There’s options with an Intel i3 processor, able to play up to 4K video. The first, Acer CXI-i34GKM, has 4GB RAM ($349); the second (CXI-i38GKM) has 8GB RAM for $399.

Worth noting: If you’re hoping to upgrade the memory or hard drive yourself, you’re out of luck—the case is hard to open without damage and parts difficult to extract [98].

AOPEN

AOPEN offers a robust (if pricey) commercial Chromebox option [99].

In fact, it’s currently the only commercial Chromebox designed for digital signage use.

With three and five year warranty options, a wide temperature operating tolerance range, metal casing, a solid state drive, and fanless construction, the Chromebox Commercial is built to withstand stressful environments that might cause consumer-grade Chromeboxes (with their fans and plastic construction) to fail prematurely.
And while the device isn’t pretty, at only 25 mm thick it’s easy to hide.

On the technical side, it boasts a Intel® Quad Core N2930 processor with 4GB memory, plus dual screen support.

The price may be a barrier, though: with an MSRP of $429 a pop, you’re definitely paying for that commercial quality.

**Lenovo**

Lenovo was a Chromebox latecomer, but brought its own twist with the ThinkCentre Chromebox Tiny[^100], which is small compared to a desktop computer, though not quite tiny for a Chromebox, at 7 x 7.2 x 1.4”.

Built of aluminum with a plastic front panel, the Tiny has some great security features, like data encryption and a way to disable USB ports to prevent unauthorized access.

Technical specs include an Intel Core i3-5005U Dual-Core processor with 2GB memory ($240 on Amazon), or a Intel 3205U processor with 2 or 4GB memory (both about $150 on Amazon).

**Lenovo also offers the ThinkCentre Tiny-In-One**, which is a tool-free way to convert the Tiny into a 23” All-In-One display.

**HP**

The HP offerings match Asus in terms of tiny size: 4.88 x 4.96 x 1.54”.

HP aims its models at enterprise buyers, offering rack mounts and other accessories.

Here’s the choices[^103]:

- Intel Celeron (2955U 1.4 GHz) with 2GB of RAM, $179 MSRP
- Intel Haswell (4600U) Core i7 processor with 4GB or 8GB RAM, starting at $629

The last option has the same specs as Asus’s Core i7 offering, but it’s available on its own, rather than in a bundle[^102].

It’s often described as blazingly fast.

And this is just the tip of the iceberg. Samsung also offers a Chromebox, and that’s not even to mention Chromebases. (Don’t worry, we’ll get to them.) Plus, there may be models we’ve missed.

You’ll have to do some comparison-shopping of your own, but this should be a good start.

But none of the options are terrible. Like every other aspect of signage, it’s about which one’s right with you.

**Pros:**

- Central Management
- Kiosk Mode
- Upgradable RAM
- Automatic software upgrades
- Various models to choose from that support different requirements like 4k
- Security and virus protection
- Low power demands

**Cons:**

- Requires an internet connection to receive updates

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**Who uses Chromeboxes for Digital Signage?**

Because of the Chrome Management Console, it’s easy to use Chromeboxes to control many screens on a large scale. It’s a true enterprise-grade solution.

You’ll find Chromeboxes behind digital signage everywhere from retail stores to universities.

Here’s just one example.

Clothing retailer Chico’s had a massive project in mind: deploying up to 5,000 screens at some 1,500 locations[^103].

They envisioned personalized content down to the store level, and control over each individual screen. They settled on HP Chromeboxes, because, according to CIO Eric Singleton,

“Since they’re cost-effective, we can afford to outfit more of our stores with more displays. Since they’re small, they don’t take up valuable space in stores and they are unobtrusive. With more screens, we have more places where we can tailor content that resonates with each store’s customers.”
Chapter 7: Google Chrome for Digital Signage

As a trial run, they outfitted one store with 10 screens, and quickly began to see the benefits.

Their previous promotional strategy, traditional printed signs, had a lead time of about ten days.

With digital signage, they can showcase new items and sales within minutes, a huge advantage in the ever-changing retail vertical.

Eventually, they hope to almost completely replace printed signage with Chromebox-driven digital displays.

What is a Chromebit?

How it works
Chromebit, born in 2015, is a small device that runs on Google’s Chrome OS operating system. The stick-like device closely resembles a thumb drive.

*The Chromebit, when plugged into the HDMI port of a monitor, acts like a tiny personal computer,* with access to the Internet and Google’s browser-based apps.

It’s seemingly similar to the Chromecast, but in fact, it is in a completely different class of machines—it is a general purpose computing tool.

It’s functionally equivalent to a Chromebook, without the display or keyboard.

So you can think of it as a $85 computer on a stick. The Chromebit is more functionality aligned with a Google Chromebox, with the same performance capabilities, but without the ethernet port or multiple peripheral ports. It allows the user to add a Bluetooth keyboard or mouse.

Because of this, the Chromebit provides more functional capabilities, complexity and flexibility than the Chromecast.

Cost
The average cost of a Chromebit is $89.

Pros
◊ Swivels, fits into small places.
◊ Great option for mobile workers.
◊ Comes with 100GB of Google Drive space for documents, photos, and other files.
◊ Can be used as a portable kiosk.

Cons
◊ Not the best solution for video content
◊ Offers only 2GB RAM, 16GB internal storage.
◊ No internal clock. So if you’re using it for day-parted content and it reboots, it won’t know what to play because it doesn’t know what time it is.

Want some techie-friendly stats to go with your pro/con list? We’ve got your back.

If it’s too jargon-heavy for your tastes, though, feel free to skip down to “How would I use it in my digital signage campaign?” You’ve already got the jist of it.

Performance
The Chromebit has 16GB of storage and 2GB of RAM (same as most Chromeboxes). It’s powered by a 1.8GHz Rockchip, RK3288-C CPU with a separate ARM® Mali™-T624 GPU.

The Chromebit was tested side-by-side with the Asus M004U Chromebox with an Intel Celeron 2955U CPU and embedded Intel HD Graphics 4000/4400. While it wasn’t a true scientific performance analysis (just played the same content on the two media players side-by-side), the two devices running a digital signage application with the same content—still images, 1080p full motion video and stereo sound—performed identically in terms of playback.

The Chromebit warmed up more than the Chromebox, most likely due to a smaller heatsink in the Chromebit form factor. Any performance differences were imperceptible watching both devices side-by-side.

Networking and USB Connectivity
The Chromebit includes 802.11 a/b/g/n/ac WiFi.
Connectivity is rock-solid and there were no perceptible performance differences between the Chromebit and the M004U Chromebox unit.

Networking performance was also very good when running the Chromebit as a computing device, browsing the internet and/or working with Google Apps.

The Chromebit was also tested with a USB Ethernet connection, turning off the WiFi through Chrome management. This worked just fine, but the device may be more cumbersome to physically manage in this configuration.

A keyboard/mouse combo connected with a small RFI USB adapter worked very well, as did the Bluetooth connection (Bluetooth V4.0 included).

Enterprise-Enabled Chrome Management

The Chromebit truly stands apart from other stick-based PCs when it comes to enterprise management.

The Chromebit is a Chrome OS device, meaning it can be fully managed, remotely, in enterprise environments via Google’s Chrome Management Console and enterprise enrollment.

Power and Display Connectivity

The Chromebit plugs directly into a display’s HDMI port, or alternatively connects via included HDMI extension cable for tight connection locations.

The Chromebit includes a small separate 18W power supply that requires an AC power connection. A USB-powered device would be ideal, but the Chromebit requires a little more power than that to operate.

**How would I use it in my digital signage campaign?**

Thanks to the Chrome Management Console, you can manage thousands of devices and remotely control your content showing on each display.

The Chromebit makes for a perfect digital signage player where wireless networking is a requirement.

Schools can use this same kind of option to track library books. Larger schools, like colleges and universities, can use the stick devices as a portal to access the school’s learning management system.

**What is a Chromebase?**

The Chromebase, first unveiled in 2014, marks Google’s dive into integrated displays. Think a Chromebox built right into a screen.

**How it Works**

Thought of another way, a Chromebase is basically the desktop-sized equivalent of a Chromebook. It runs Chrome OS, and is thus heavily focused on web-based applications.

Just like a Chromebox, the Chromebase can be easily enrolled in CMC for remote management and configuration. It can also boot directly into kiosk mode. You can connect up a keyboard and mouse, if desired.

Basically, all you need to do is plug it in, connect it up to the Internet, and start pushing content to it from your CMS. Content can be stored on the Chromebase or streamed over the Internet (safely cached in case your connection crashes).

Several models offer additional features, such as a webcam and touchscreen capability for interaction, or the possibility to attach POS peripherals.
Cost and Models
$300–1,099

As with the Chromebox, there are several models on the market. Here’s a summary.

**LG**

LG’s 21.5”, full HD Chromebase is relatively affordable at $280 per unit, but not quite ideal for an enterprise setting[107].

With a 1.4 GHz Intel Celeron processor and 2GB of RAM, it’s similar to most Chromeboxes in terms of computing power. Storage-wise, it’s got a 16GB SSD and two years of access to 100GB on Google Drive.

It’s EnergyStar rated.

The LCD screen is not touch-sensitive.

Probably the biggest drawback to this device is its built-in stand[108]. With no good way of detaching it, you’re stuck using this Chromebase on a table or desk. You can’t wall mount it or build it into a kiosk.

Ultimately, it looks like something more suited to an office desk, and has only a 1-year limited warranty. It’s not quite an enterprise-grade Chromebase.

**Acer**

Acer currently offers 21.5” (touch and non-touch) and 24” (touch and non-touch) versions of the Chromebase. All are full HD, with LED-backlit LCD screens. The touchscreens have 10-point multitouch capability.

Right from the get-go, it looks more like a digital sign than the LG model, since it doesn’t have a stand—though the speakers built in to the bottom-edge bezel are obvious and a little bulky depending on what you’re going for.

The 21.5” model ($300 without touch capability, or $430 with) has a Tegra 2.1 GHz processor, 4GB RAM, and the same standard features as the Chromeboxes discussed earlier do[109].

The bezel is white, which might stand out in some settings.

The 24” models seem to be optimized for teleconferencing, with a built-in HD webcam and microphones. The bezel is a subtle black. Able to tilt between −5 and 30°, the stand is designed to work with VESA mounts for wall or arm mounting[110].

And then there’s the all-important security features, like a Kensington lock slot, built-in encryption, and Verified Boot, which checks files for tampering each time the screen boots up.

Since there are five different models (ranging in price from $430 for the touchless to $900 for the top-of-the-line touchscreen).

Differentiating factors include amount of RAM, 16 vs 32 GB SSD, and Intel Celeron vs. i5 vs. i7 processors[110].

**AOPEN**

AOPEN’s solutions are truly designed for commercial settings, with tempered glass, semi-waterproof fronts, a screen capable of staying on 24/7, and a mere 30 mm depth. You can choose between a 3 and 5 year warranty[111].

Unlike all the other models, it doesn’t have a fan, making it silent and dust-proof. Despite being fanless, it has a wide temperature operating range, up to 104°F.

It’s right at home in kiosk or POS applications. Like the Acer models, it has 10-point touch capability.

But beyond that, it’s got tons of powered peripheral ports meant to connect up to other gadgets, such as a card swipe. It’s meant to be tamperproof.

Under the hood, there’s an Intel Quad Core processor, 4GB RAM, and a 32GB SSD.

Currently it only comes in 22” size, with an MSRP of $1099, though a 19” screen is set to release eventually[111].

That price tag is the rub.

Add a $24/device/year single app CMC enrollment, or a $150/device perpetual enrollment to CMC, and you’ve got an investment that only an enterprise with a hefty budget could swallow.
Chapter 7: Google Chrome for Digital Signage

Pros
◊ All-in-one convenience
◊ Central Management
◊ Kiosk Mode
◊ Security and virus protection
◊ Automatic updates
◊ Touchscreen models available

Cons
◊ Fewer choices in screen sizes and types
◊ Obtrusive bezels on some models
◊ No signal-splitting
◊ Potentially high costs compared to Chromebox

How Would I Use it for Digital Signage?

Despite being a recently developed technology, Chromebase is already being successfully deployed in retail and QSR settings.

Here’s an example:

In early 2016, Australian seafood franchise Famous Fish decided to bring a fresh look alongside its fresh fish at a newly opened franchise[112].

That meant bringing in digital signage: dynamic menu boards and self-service order kiosks.

After hearing good things about Google’s security and reliability, Famous Fish settled on AOPEN’s Chromebases. They found that the screens blended into their clean seaside aesthetic seamlessly.

Plus, since their customers now had the the ability to explore and ponder options on their own, the average transaction value jumped to nearly 28 percent higher than other locations.

They now plan on rolling out Chromebase to other locations.

How Else Can I Use It?

Your use-cases are slightly limited by the size and durability of the screens. Most seem to be designed for indoor use only, and due to the width and shape of the bezels, none are suitable for tiling into a video wall.

Other than that, though, Chromebases should be suitable for many digital signage applications, from end-cap advertisement, to donor boards, to indoor wayfinding, to sign-up kiosks, to self-service check-out devices.

What is a Chromecast?

Let’s clear this up right away: the Chromecast was created as a consumer product, not for enterprises or for digital signage. Since it can display content to a screen, many people have the misconception that it’s a digital signage solution. That’s the only reason we’re including it here, is to clear up the misconceptions.

Short answer: the Chromecast is not a digital signage solution. It’s not even a true media player.

Long answer: you could hobble along if you really wanted to. More on that in just a second.

Chromecast, born in 2013, is a media-streaming device that plugs into the HDMI port of a screen, allowing the user to stream content. The device is small and is shaped like a mini hockey puck.

How it Works

The small, round device plugs into your HDMI port and connects to a Wi-Fi network. It acts as a portal for the content on your computer or smartphone to be played on your display.

The Chromecast, as its name implies, is intended to “cast” content from one location such as a computer, tablet or smartphone, onto a display.

The Chromecast includes apps such as Netflix that can cast content streamed from the internet onto the same display.
Cost
The average cost of Chromecast is $35.

Pros
◊ Because the content is streamed directly from the Internet, the battery on your phone or computer won’t drain quickly.
◊ Chromecast now supports 4K streaming

Cons
◊ Requires a dedicated device (computer, phone, or tablet) to stream content for every location, making it an expensive and complex solution if you try to scale
◊ No central way to manage content for multiple screens or locations—you don’t get access to the Chrome Management Console with the Chromecast
◊ Not compatible with Blackberry or Windows Devices.
◊ Requires a strong Wi-Fi connection.

How would I use it?
If you’re a small business with just one digital sign in your store, the Chromecast might work for you if you’re okay with having a dedicated computer or device to stream the content.

Likewise, if your digital signage objective is to learn about digital signage and maybe experiment with a single sign, then the Chromecast might be a good place to start.

Here’s the drawback:

Using Chromecast for more than one display makes it difficult to manage because there is no central management solution—they can’t be enrolled in the Chrome Management Console.

Because of this, it’s hard to scale support for this with content for multiple signs because you have to have another device at each and every location that’s pushing content to the Chromecast.

If you have 10 screens and need to update the content, you have to make 10 changes – going to each physical device to update.

The security for the Chromecast is light at best.

Change your WiFi security code or SSID and you’ll have have to do it all again, at every display.

What if some accidentally logs-in to one of your content source computers and starts browsing the web? There’s no kiosk mode, as with Chromebox.

What else can I use it for?
But just because it’s not meant for digital signage doesn’t mean it’s not a great tool for the office...

This little number is ideal for presentations.[113]

It can also be used to play games. There are about 100 games for Chromecast that can be found in Google Play.

Which Chrome Device Makes the Best Media Player for Digital Signage?
Every digital signage campaign needs a media player to support the content that will be used in the campaign. Depending on your company and what you’re trying to accomplish, the Chromebox, Chromebase, or the Chromebit could be your answer.

Chromebox is a great all-around solution, with many model types to accomplish different goals. While the Chromebox can alternatively accomplish a similar thing on a much smaller scale, the Chromebox packs more of a punch.

The Chromebox is the enterprise-grade digital signage player from Google.

Chromebase is a still-emerging Chrome OS technology. While options are currently limited, the all-in-one nature is incredibly convenient (provided the screen meets your needs). It can do everything a Chromebox can.

Aside from AOPEN’s model, though, none are optimized for a commercial setting.

86
**Chapter 7: Google Chrome for Digital Signage**

**Chromebit** is a solid digital signage player at a great price but cannot support 4k video and has limited power. Unlimited devices and displays can be controlled remotely with this option, thanks to the Chrome Management Console.

**Chrome Device Management (CDM) and Chrome Management Console (CMC)**

There will always be the 1-2 person donut shops that plug in a flash drive to a monitor and showcase a slideshow they made in the back office a few minutes ago with their specials.

And for them, that works.

But if you’re a 20-location donut empire, then you have multiple layers of complexity to navigate.

Some common ones I’ve seen are:

- Maintaining brand guidelines
- Ensuring all locations are showing the same promotions: it’s difficult to change a promotion last-minute when you’re dealing with so many locations. Relying on store managers to receive your email and download a presentation onto a flash drive is time-consuming and never has 100% success.
- Communicating with employees about events coming up and giving them a briefing over promotions
- Displaying company news

Many companies that operate with multiple locations use digital signage solutions to be able to do all of that at scale.

And that means finding the right device management system.

Since Google Chrome’s operating system, Chrome Management Console and Chrome Device Management (CDM), single app kiosk license, is perfect for digital signage, it’s a wonder that not all solutions use it.

This is perhaps the Chrome’s best feature.

After subscribing to the Chrome Management Console service ($50/device/year for full use, or Chrome Device Management $24 for a Single-App Kiosk license), all the administrator has to do is enroll each new device in the system, which takes just seconds to do[114].

And then, they can control every aspect of every screen, from anywhere they want to.

If you’re part of the education vertical, you’ll likely get a discount on the license fees.

**Side note:** You’re more likely to want the Single App license for your devices if you plan on using them exclusively for digital signage.

That will give you access to all the settings necessary to configure, deploy, and monitor a device running a single app in Kiosk mode. You won’t be able to use that device as a workstation, or manage and deploy policies at the user level[114].

1. **Managed**

The Chrome operating system and the corresponding Chrome hardware is a managed system.

Once the device is enrolled in a domain, the administrator has the ability to manage every aspect of the device.

In the realm of digital signage we have the ability to restrict the device to running the signage application only—that is, putting it in Kiosk Mode.

This means that the device cannot be repurposed without an administrator intervening.

Here’s why that’s important.

Let’s say you have a Chromebox running your digital signage in the employee break room.

A clever employee may think they could plug a keyboard and mouse into the device and be able to surf over lunch. Thanks to Chrome OS management, the device is restricted to digital signage display and support personnel only.
The entire Chrome OS management console is accessed through the web, which means that people with administrative access can manage your devices from anywhere (even your mobile device).

2. 0–60 Rollout
The managed capability also allows for fast and easy rollout, since the only step an administrator needs to take is to enroll the device into their domain.

At that point, all the necessary settings, policies, and configurations are automatically downloaded to the device. For a digital signage administrator, this means that in mere minutes you can have your entire signage fleet up and running, and you won’t need to install a thing!

This same benefit means that if you need to rollout an additional series of displays you won’t need to waste time installing software, setting up policies, or configuring apps.

A display administrator only needs a few seconds to enroll the device and it will automatically obtain all the necessary policies and applications for its purpose.

3. Secure
Chrome OS is built from the ground up with security in mind.

With features like verified boot and data encryption you can ensure that no malicious software can ever take over your system or data.

Unlike other operating systems, Chrome OS allows a digital signage administrator to automatically run their digital signs right when the machine turns on.

And, like I mentioned, it also prevents users from hijacking the device for other purposes.

Google’s security team is constantly seeking out vulnerabilities to patch and sending out automatic updates. It’s been hailed by many as the most secure operating system you can get.

4. Update automatically
Chrome OS is automatically updated seamlessly in the background.

This negates the need for additional patch management systems or manually updating your fleet of devices.

Gone are the days of administrators needing to worry about making sure their devices are updated, or making sure that latest security vulnerability was patched.

Chrome Management takes care of this and even gives the administrator control over timing and distribution of the patches, so you can automatically scan for updates every morning at 4 a.m. when there’s the lowest bandwidth usage.

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The Google ecosystem has compelling hardware / media players available to run your digital signs. Chrome provides a platform for innovation.

Chrome-based digital signage solutions are by far the most secure, easy to manage, scalable, and easy to implement. There are many digital signage media players to choose from. Here are the pros and cons to each Chrome-based media player.

**Chromebox**

**Pros**

- Central Management
- Kiosk Mode
- Upgradable RAM
- Automatic software upgrades
- Various models to choose from that support different requirements like 4k
- Security and virus protection
- Low power demands

**Cons**

- Requires an internet connection to receive updates
**Chromebit**

**Pros**
- Swivels, fits into small places.
- Great option for mobile workers.
- Comes with 100GB of Google Drive space for documents, photos, and other files.
- Can be used as a portable kiosk.

**Cons**
- Not the best solution for video content
- Offers only 2GB RAM, 16GB internal storage.
- No internal clock. So if you’re using it for day-parted content and it reboots, it won’t know what to play because it doesn’t know what time it is.

**Chromebase**

**Pros**
- All-in-one convenience
- Central Management
- Kiosk Mode
- Security and virus protection
- Automatic updates
- Touchscreen models available

**Cons**
- Fewer choices in screen sizes and types
- Obtrusive bezels on some models
- No signal-s劈ting
- Potentially high costs compared to Chromebox
**Chromecast**

**Pros**
- Because the content is streamed directly from the Internet, the battery on your phone or computer won’t drain quickly.
- 4K streaming

**Cons**
- Requires a dedicated device (computer, phone, or tablet) to stream content for every location, making it an expensive and complex solution if you try to scale
- No central way to manage content for multiple screens or locations—you don’t get access to the Chrome Management Console with the Chromecast
- Not compatible with Blackberry or Windows Devices.
- Requires a strong Wi-Fi connection.
- Built for consumers, not for the enterprise
What Content to Put on Your Displays
What Content to Put on Your Displays

If you hate the cliche “Content is King” raise your hand. You know why industry experts keep saying it, over and over? Because it’s still 100% true.

Content is what people look to your digital signage to see. Your customers don’t care about your well-chosen media player. They care about the information or entertainment your digital signage promises them.

And it’s easy to trip up on content.

I’ve heard about, but have yet to witness, a QSR accidentally advertising for its own competitor\[85\].

Surely you’ve never made such a grave mistake—but odds are you’re still making some common errors in your content. Maybe not that bad, but it might need some polishing. Ask yourself:

◊ Are you keeping the same content for weeks at a time? Months?
◊ Do you use bullet points? Long sentences?
◊ Does your content flash by on the screen too quickly to read, or too slow to hold attention?
◊ Is your content aligned with your brand identity?

A lot of careful consideration goes into making top-quality, eye-catching content specifically for digital signage. In this chapter, we’re revealing inside secrets about how to do exactly that. Get your PDF here.

Where’s the Sign Placed?

Is your digital sign located at a Point of Transit, Point of Sale, or Point of Wait?

The answer should help you determine the pacing and amount of information conveyed in your content.

Point of Transit

A Point of Transit sign is located where people are on the go. This includes things like wayfinding kiosks at airports and digital billboards along highways.

If your sign falls into this category, recognize that you have very little time to get the attention of passers-by.

Particularly with advertising, you must strive to be as concise and bold as possible, using some of the tricks we’ll be discussing later.

Why?

Because average dwell time for something like a digital billboard is around two seconds\[86\]. That’s not much time to make an impression.

If you have multiple segments of content on your loop, they should cycle through quickly enough to maximize chances of your audience seeing multiple messages.

Answering the Big Content Questions

Before you think about what picture’s perfect for a certain slide, there’s some big picture questions you need to answer. These will help guide the general tone and look of your content.
Point of Sale
If you have a Point of Sale network, there’s not quite as much of a hurry, but your audience is still there for a purpose.

Focus on providing immediately relevant content that focuses on opportunities available now—for example, a sale in a nearby aisle, or a giveaway that can be entered on the go.

Consider timing how long customers spend within visual range of your signs. This will help you determine how often to switch between segments. If the same information remains on-screen for the entire time your customer is within visual range, they’ll get bored and stop looking.

Make sure whatever information you put on the screen is readable within the time allotted!

Point of Wait
With Point of Wait signs, you have a captive audience. As customers queue or linger in a waiting room, they’ll be desperate for anything to distract them.

This means you can include longer messages and more words per segment.

However, in order to take advantage of that longer dwell time, you’ll have to compete with cell phones. Consider mixing in trivia questions or fun facts with advertising and other important information in order to keep customers’ attention.

Who’s Seeing It?
Not all potential target audiences react the same way to content.

Age is a big factor.

For example, if every Thursday is senior discount day at your store, the messaging playing that day shouldn’t focus on social media engagement.

Given that only 18 percent of people between ages 50 and 64 access social media on their mobile phones—that is, potentially while in your store—you’d have very little chance of fostering customer engagement that way.

However, if you had a vintage clothing store in Brooklyn, you could target your younger-skewing customers with social media-oriented content.

Demographics should inform design, information, and call-to-action choices as well. (We’ll talk more about design later—this is just to get you thinking.)

If your corporation is a professional environment full of no-nonsense businessmen, you’ll want sleek designs with simple color schemes.

How Are You Approaching the Campaign?
It makes sense that your content will change depending on the purpose of your signage.

All communication, including digital signage, fits one or more of six purposes. Your content will probably include a mix of at least a couple of them.

Here’s a simple breakdown.

1. Educate
Educational content has a number of uses.

A well-informed shopper can make the best choice for his or her needs.

Outward-facing educational content can include product demos, use cases and testimonials, and handy comparison charts to other products (or with your competitors’ products!).

Employees and associates can also benefit from watching training content during slow traffic periods or before/after store operating hours.

Whether providing information to customers or associates, your bottom line will feel the boost.
2. Inform
Where’s that conference room? When’s the office picnic coming up?
That type of question can be answered by informational content.

This includes company announcements (especially useful if you have a QSR and the employees don’t have company emails), calendar events, and wayfinding.

**Informational content should prioritize clear communication.**
Aesthetics are important, too, but ultimately secondary.

Keep your interfaces clear and simple for interactive informational content, and make sure the five W’s can be gleaned at a glance.

3. Entertain
Your audience will get sick of continual ads.

Sorry, but it’s true.

You have to break it up with engaging, attention-grabbing content of another sort.

There’s lots of options out there for entertaining content, so pick something relevant to your audience: sports, weather, news, a stock ticker...

This type of content is inexpensive and available in many forms, like live streaming, files, static images and RSS feeds, just to name a few.

In QSR, some franchises use infotainment—a custom blend of entertainment programming and advertising aimed squarely at keeping customers around long enough to buy more food. (And also at building their brand image, which we’ll talk about shortly.)

They know that **content doesn’t have to be pure advertising to help the bottom line.**

4. Convert
Often, your content’s purpose will be to get your audience to do something, such as sign up for a loyalty or reward program.

How do you craft a compelling call-to-action?

We give you the details under “Give Your Viewer a Job” below.

5. Promote
Promotions aren’t necessarily trying to sell anything. But they are a little flashier than the above-mentioned information content.

The idea is to *catch eyes and bring awareness about something your audience wasn’t aware of before.*

For example: You can promote upcoming events and opportunities, award programs, and your social media.

With social media, you can display the feeds right there on the signage using widgets that are included with most CMS, and pair with a call-to-action to encourage your audience to follow you.

We’ll talk more about social media and how it can help your branding efforts a little later.

6. Sell To
Remember: All ads, all the time will get your digital signage tuned out eventually.

Keep a mixture, and it’ll make your ads that much more effective.

Ads made for traditional forms of advertising can sometimes be repurposed for use in a digital signage network.

But, often ads need to be produced with the venue and dwell time in mind, as we mentioned under “Where’s it Placed?”

Also think about how often ads will show up in a given “loop” of content. People often suggest having a single ad make two impressions per loop, though that wouldn’t be the case for advertising banners or crawls.

Here’s a challenge: *if there’s no sound, you’ll have to rely on visual appeal. We’ve got some tips for that later in this chapter, but realistically, you may want to enlist the help of a professional.*

In the retail vertical, digital signage often includes merchandising that advertises specific items located physically near the sign. This type of “ad” varies in length and usually includes a call-to-action.

For retailers, presenting contextually relevant content can enhance shoppers’ experiences and help each sign’s ROI.
What Content has Worked for Your Competitors?

Managing expectations is an important aspect of creating digital signage content.

There are certain expectations for what content will look like in each vertical, in each business.

For example, if I say "sports equipment store," you probably think of high-def HDR images of dirty, sweating athletes; angular sans serif fonts that look like they’re about to zoom off the signage; and close-ups of shoes, high-performance sports drinks, and so on.

You’d be baffled if the signage featured news about the stock markets, instead of the latest big game.

How do you surprise and excite without confusing your customers or failing to meet expectations?

That’s a question you’ll have to answer for yourself, because the answer will be different for every business in every vertical.

But I can give you a starting point: You can’t break the rules until you know what they are.

So study your immediate competitors, along with the big names in your vertical. Know what kind of language they use, what sort of imagery they rely on. Know what kind of content is de rigeur.

If they have a marketing push that’s the talk of the town, take note. Don’t copy it, of course—but you can take the same basic idea and put your own spin on it.

Check out your vertical on a site like Digital Signage Today for glimpses of successful campaigns that push the envelope.

What’s Your Brand Identity?

A well-formed brand differentiates a company from its competitors.[8]

Using digital signage to create an emotional connection with consumers attaches your brand to their lives and in turn creates loyalty and builds equity in your brand.

As you’re striving to maintain brand consistency, make sure you don’t overlook your digital signage!

Not only is digital signage a chance to put your brand front-and-center from the moment customers walk in the door to the moment you leave, but having poorly designed and out-of-character content can damage your image.

That said, here are three ways for you to make sure your brand stays clear and central in your digital signage.

1. Keep a Consistent Look

It may be tempting, for simplicity’s sake, to use a theme you found online or that came with your content-creating software for your digital signage.

Three problems: that’s boring and lazy from the customer’s viewpoint, it’s a missed opportunity to brand content, and it can lead to incongruities between your overall brand and what’s on your screen.

For example, a vehicle parts supply store probably would wish to avoid delicate fonts, Instagram-style filters and shades of pink.

Nor do you want your visual style to vary from slide to slide.

A little customization goes a long way.

If your company already has a style guide, that’s your place to start to find guidelines for producing on-brand content.
Otherwise, it’s worth it to take the time and decide how you’re going to create a uniform look for all of your content.\[120\]

- **Color Scheme:** Your company probably already colors that they tend to use in their promotional material and décor. *Use a neutral tone for backgrounds, a color associated with your brand for contrast, and one other color that fits the brand and looks attractive as an accent.* To make sure you’re always using the same red, define it using a hexadecimal code. If you want to sample a color from your logo or website, there are Chrome extensions that’ll help.\[141\]

- **Preferred Fonts:** If the brand is already defined typographically, go with those fonts. Otherwise, choose a sans serif font to be used for most content, and one or two other fonts from different font families for emphasizing elements.\[121\] (No more than two fonts per slide!)

- **Template Slides:** Consider creating a collection of blank template slides into which content can be inserted in order to guarantee a uniform look. (You’ll want a variety so all of your content doesn’t look exactly the same.) Whatever program you’re creating content in may have some built-in options.

- **Imagery:** Decide what sort of pictures you want to include in your content. Would you prefer exclusively black-and-white images? Should they ever include people? Is clip art ever acceptable?

2. **Create a Content Guide**

*Provide guidelines to make sure your written content stays in the brand’s voice.*

- **Tone:** Are you sassy? Formal? Always positive?
- **Focus:** Is plain, simple information preferred, or can you have a little personality?
- **Word choice:** Are there certain words you prefer to avoid? Are there specific words associated with your brand?
- **Style guide:** Should content conform to a specific style guide, such as AP or Chicago?
- **Terminology:** Make sure commonly-used terms and phrases are always spelled, worded, and capitalized the same way.

3. **Make it All Readily Available**

Once you have all of these guidelines created, make sure they’re available to everybody who could conceivably create content for your digital signage. You could create print copies, but it’s easier and more cost-effective to share online. This document or set of documents should also contain necessary files such as logos, icons, and images.\[122\]

Consider posting them on Google Drive and sharing the link to your content creators.

Be open to feedback. Especially if you aren’t a marketer or designer, other members of your team may have useful suggestions for improvements.

As trends come and go, and your company tweaks its own brand, your guide should change as well. That’s another reason why cloud-based sharing is advantageous: it allows any changes to be distributed instantly to all who have access to the document.

5 Tips for Writing Compelling Content That Will Get Seen

Once you’ve set your vision for your content, you can fire up a content creation program and get going. Here’s some tips to help you along your way.

1. **Try Something New**

If you don’t refresh your content frequently, repeat visitors will eventually stop paying attention to your signs.\[123\]

However, you don’t have to start from scratch every time.

You can simply swap new stock images into your existing content. Or change the layout of an existing message. Or add a bit of motion where there hadn’t been any before. Or maybe just change the color scheme.
But beware! There’s a temptation to resort to “wallpaper”—cheap, generic, readily available material for your screen—in order to ensure there’s something fresh on-screen at all times. That type of content is not only easy to ignore and is useless in promoting your brand, but can in fact harm the effectiveness of your network.

Don’t wallpaper.

That’s a matter of simple math: if ten percent of your content is, say, generically pretty landscapes, ten percent of the time viewers will be seeing material that offers no useful information and doesn’t speak to your brand.

It also helps hold interest if you vary the length of your messaging. Most of your messages will be on-screen for about 10 seconds, but if you need to communicate more intricate information (say, with 17-second long slots), make sure to break it up with shorter and simpler slides too.

For other concerns about producing enough content, and creating data-driven and localized content, peep back at Chapter 3.

2. Design Properly

It’s time for a crash-course in the principles of digital signage design.

Your goal is maximizing visual appeal and ease of reading.

In an ideal world, you could hire graphic designers to do this for you, but given how frequently content cycles out, that’s not an economically feasible option for many companies.

Luckily, by focusing on a few key areas, you can do this in a few minutes for yourself.

Resolution and Aspect Ratio

Make sure these match your screen. Very little looks worse than content that’s stretched or squashed because its aspect ratio is wrong.

Font Choice

Hopefully you know better than to choose Comic Sans or Papyrus. There’s more to it than that, though.

Particularly on outdoor signs, you should avoid difficult-to-read script fonts. If you use it as an accent font, make sure it’s large and only used on one or two words.

Choose sans serif fonts (Helvetica’s the classic example) over serif fonts (such as Times New Roman)—the lack of serifs gives them a cleaner look.

Have no more than two fonts per slide or segment of content, and make sure they’re from different categories. Two novelty fonts in the same place is too visually busy.

Finally, consider tone. A heavy blackletter font would look out of place on an advertisement for a summer sale, but might fit an announcement about a book club.

Colors

With colors, contrast is the name of the game.

Pair dark text with light backgrounds. Be wary of using white text on a black background—if the letters are too small, they can be hard to read.

You also want your colors to be visually attractive together. Use the color wheel as your cheat sheet. Complimentary colors (opposite each other on the color wheel) pair nicely. So do colors that are next to each other on the wheel, called analogous colors.

Fewer colors is better—one color should dominate, another contrast and highlight, with maybe a third for accent (perhaps as part of the image).

Composition

When it comes to composition, it’s hard to go wrong with the rule of thirds. It’ll help you achieve asymmetrical balance. Asymmetry catches the eye and is more visually interesting than symmetry, but you have to execute it correctly.

First, mentally divide your screen into nine rectangles of equal size.

Second, place your elements. Content close to the intersection of the lines will stand out more. That’s where you want important elements to go.

Also consider filling one-third of the space with an image while putting a neutral background with text in the other two-thirds for a simple, clean look.
Motion

While it’s tempting to animate every square corner of the screen, don’t. Seriously, don’t.

Moving text is too difficult to read, and more than one moving element will vie for the viewer’s attention and distract from the actual message.

**Motion should be used sparingly, to grab the eye and attract attention to one key part of a slide without hurting readability.**

For visual interest, a slow pan over a static image, or a steady shot of something slightly moving (like waving grass, or a time lapse of a cityscape) are arresting without being distracting.

Of course, it’s a different story if your content includes video.

Readability

The above items do contribute to readability, but here’s a few final tips.

**Brevity**
*Deliver your whole message in as few words as possible.* The fewer words, the more impact each word will have.[130]

You don’t even need to use full sentences.

If you must include more words, make sure the message is on-screen long enough to read.

Distance

Double-check that the content is large enough to be read from wherever viewers will be standing when they see it. There’s some useful rules to help you do that.

With an **LCD screen**, use the **4/6/8 rule**[131]. That means that viewers can be four times the image height away in order to process complex information, six times to view simple information, and eight times for casual perusal.

With **LED**, take the **pixel pitch and multiply by 1000** to find the **minimum viewing distance**.

No analytical method yet exists for finding the minimum viewing distance for a projected image, though one’s on the way[132].

**Accessibility**

Consider accessibility, too.

Strong contrasts, avoiding white-on-black text (use the other way around), simple typefaces, and the largest font size possible will help people who have difficulty seeing or reading.

3. Check and Double Check

Because there are so few words per slide, any mistakes you make will jump out dramatically.

Read through all your content (and get someone else to look through it for you) to make sure there are no grammatical or spelling errors.

Someone will inevitably mock you on social media for a typo. Trust me, that’s not the kind of attention you want.

Also ensure that all information is accurate. If you direct customers to the wrong aisle for a deal, you could be missing out on sales opportunities. And heaven forbid you give the wrong date for an event.

4. Give Your Viewer a Job

Picture this: You’re the proprietor of a grocery store, and you’ve just installed your first digital signage system.

You’ve been careful to do everything right.

But a week passes, and then two, and you’re not seeing the kind of results you were expecting. What went wrong? You followed the whole checklist, right?

Well… maybe not.

Did you remember to include a **call-to-action**?

Forgetting a call-to-action, or including one that’s poorly worded, can render a digital signage system pretty much useless.

A call-to-action directs customers to give a certain response to the message on screen.

This can be anything from downloading an app, to picking up a coupon, to signing up for an event, to engaging with you on social media, to taking advantage of a deal.

**A call-to-action is a command for your customer to take a specific action.**
By tracking the level of response to calls to action, and which sorts of calls get the greatest response, owners of digital signage networks can determine how effective their signage is and how to make it even more effective.

In other words, they are absolutely essential. Below, you’ll find tips for creating compelling calls to action:

**Consider the Audience**
*Different demographics will find certain methods of action more appealing.*

Take QR code usage, for example. Across age groups, 64 percent of scanners are male. The disparity was greatest in the 55+ age group, with 71 percent of scanners being male. However, that age group makes up only 15 percent of all people using QR codes. People between the age of 25 and 44 were most likely to scan a QR code. Another example: paperless coupons, distributed by email or found on the Internet. Women are only slightly more likely to use them than men. They’re most popular among those aged 35–44, though people aged from 18 all the way up to 64 are all fairly likely to use them.

You should be able to find statistics for other common methods of action online, and **common sense is a valuable tool here as well.**

Vary your action based on what demographic you wish to target—or, with broad appeals, try to choose a method with the highest engagement rate across demographics.

**Enable and Incentivize Action**
*If your viewers don’t understand how to act, or if acting is difficult, they won’t act.*

That’s elementary, but worth pointing out.

**Make sure that the exact steps a viewer needs to follow to take action are clearly and thoroughly listed on the screen.**

If the screen is advertising a sale on a specific item, tell them where in the store the item is located. If the action is connecting on Instagram, give the exact username. If there’s a contest, either list the steps required to enter, or give the general idea and display a link where people can find further details.

Make it as easy for your viewers as possible.

One of the greatest advantages of digital signage is how it enables instant interaction, so take advantage of that by making the call-to-action something that can be done immediately, such as:

- tapping their phone to a tag to have content uploaded
- texting a keyword to a certain number, or
- watching an interactive presentation in order to receive a discount code.

Also, **make sure the benefit to following the call to advantage is obvious**—list it right there with the action to be taken. “Text (keyword) to (number) and get 20% off any item.”

**A Second Purpose**
*Your call-to-action doesn’t have to serve just one purpose—in fact, if you can have a secondary purpose, go for it.*

For example, perhaps your primary purpose is to get viewers to enter a contest by tweeting at the store’s Twitter account.

Your secondary purpose would be getting people to engage with your social media, in hopes that they’ll continue engaging there in the future.

Even if your primary message isn’t one that require a certain action, you can include one anyway. For example, if you’re announcing an event, you can direct viewers to an online calendar so they can view other upcoming events.

The main caveat here: **Don’t add too many steps.**

Everyone’s lazy at heart, and if people have to jump through three or four hoops to receive a certain benefit, they will probably decide it’s not worth it.

**Choose Your Words**

- **Action verbs:** Avoid passive language, such as “can be found” or “is available.” Instead, pick action verbs that convey your call-to-action forcefully. *Don’t suggest—command.* Act now! Find it here! Visit today!
Chapter 8: What Content to Put on Your Displays

◊ **Trigger words:** Certain words are more likely to catch eyes than others. You can find lists of powerful marketing words online\[136\], but here's a few to get you started: *You* (makes the customer feel directly engaged), *free* (speaks for itself), *save* (everyone loves savings), *easy* (customers are less likely to take action if it means work for them), and *new* (novelty is compelling).

◊ **Keep it short:** The same rules you’d follow for making a compelling slide presentation apply here: the fewer words you can use to convey your message, the better.

◊ **Keep it simple:** Prefer language that is clear and straightforward. Write like you’re scripting a comic book, with snappy, short, action-oriented words. Use a readability score tool to estimate the message’s reading level. As a general rule of thumb, most good business blogs try to communicate complex concepts using vocabulary under a 7th grade reading level. It’s faster to skim and digest.[137]

**Make it Visible**

If the call-to-action is the most important part of your slide, treat it as such.

Make it larger or a different color than other elements (aside from the headline).

You may wish to offset it with a border.

You can take this too far, of course. Don’t confuse contrasting with clashing: yellow and red, vivid green and purple, or a riot of neon will just hurt your customer’s eyes and be difficult to read. Flashing or animated elements are tacky and distract from your message.

*Don’t sacrifice good design in the name of catching eyes.*

If you include a QR code, make sure it's large enough to easily scan from wherever the viewer is standing. If you include a URL, make sure that is readable as well.

**Create Urgency**

**Limited-time offers are the most compelling**[138].

How many times have you been watching an infomercial, chuckling at the ridiculousness of the product on offer, and been a little tempted once they reached the “Call now and get all these extra things!” part?

Put that principle to work in your call-to-action.

Perhaps the first 50 customers to take advantage of an offer get a bonus item or extra 10 percent off. Maybe the special coupon is only available for the next 36 hours. The contest ends tomorrow.

You get the idea.

Don’t go overboard, though. *If every single deal is “Act now or you’ll never see it again!” customers will become annoyed with the manufactured scarcity.*

**5. Integrate your social media**

Need more in-voice and fresh content?

Try tapping a resource you probably already have: your social media accounts.

Your Twitter feed or Facebook page should be updated frequently, and should already have a particular voice that reflects your brand’s personality.

Not only that, but with modern digital signage software, displaying a live and/or curated feed on your screens is simple. Many social media networks have an API that developers can use to develop a custom module for your signage[139].

If you choose to display posts from followers, that reinforces your customers’ sense that your brand is personable and that they have a personal relationship with your company, fostering loyalty.

In fact, 55 percent of Americans state they’re more likely to stick with a brand they follow on social media[140].

And, bonus, by displaying your social media feeds, you’ll remind your visitors that they exist—which should translate into new followers and an expanded reach.
Make sure to show your username or handle, and consider displaying a QR code or shortened link so interested customers can follow you instantly.

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4 FREE TOOLS

Design Beautiful Digital Signage Content

Whether you’re a designer or don’t have a design bone in your body, these 4 free tools will help you make gorgeous content for your digital displays faster than ever. Use any or all of them in your future signage content.

Your content always needs to serve a purpose:

1. Educate
2. Inform
3. Entertain
4. Convert
5. Promote

Make sure you include a clear call-to-action! Forgetting a call-to-action, or including one that’s poorly worded, can render a digital signage system pretty much useless.

Typography
fonts.google.com
Download beautiful web safe fonts, for free! Find a nice variety of fonts to choose from to make your presentations more dynamic.

Free Icons
iconmonstr.com
Great place to download high quality icons for presentations and visuals. Download the .png file format and change the color of your icons before exporting.

Picking Colors
coolors.co
Generate beautiful color palettes easily so you know that every color will be complementary.

Free Photos and Videos
allthefreestock.com
The web’s free stock photos and videos directory. Browse through different websites to find the right assets for your content.
Installing & Rolling Out Digital Signage
Installing and Rolling Out Digital Signage

While the retail sector currently makes up the largest part of the digital signage industry, it’s widely adopted in food service, transportation, financial services and education.

You’ve also been seeing some promising statistics on the success of digital signage, and the fact that the industry has a CAGR of nearly 9% is encouraging as well.

You might be considering rolling out digital signage. After all, it seems to be bringing great results for others, and since prices for digital signage systems have been steadily dropping, it seems like the time is right and it’s an easy way to get a return on your investment.

However, you can’t just get any old screen, slap it up at random, and expect to rake in the dough. They aren’t a magical revenue-generating charm.

Even if your aim isn’t advertisement, you still have information you want to communicate.

If the screens aren’t doing the best job to communicate that information that they possibly can, they may not offer much advantage over traditional signage in getting your point across. That said, studies still show that up to 43% of traditional paper-based signage used in campaigns or for promotions is never installed, so at least the digital signage has a 100% compliance advantage when it comes to installation.

You must put serious thought into your strategy for installing digital signage in order to maximize its usefulness and accessibility to your audience.

A Purpose

Your purpose in installing digital signage will inform all of your other decisions about it. So it’s important to clearly define it, right from the start.

Case in point: You need to choose the right digital display to install based on the placement and environment in your store. A retail sign near a window may require a semi-outdoor display that will have higher brightness to counter the direct sun light?

Of course, the problems can start long before your digital signage is even fully installed. Without a fully planned strategy, costly trial and error can make your expenses quickly balloon above your budget.

In this chapter, we’ll walk you through the digital signage rollout planning process and give you an idea of what to expect along the way. Get you PDF here.

What Goes Into Creating a Rollout Strategy?

In order to form a smooth rollout strategy, you’ll need to take a big-picture look at your intentions for your digital signage, decide who you’re going to work with, and plan each aspect of your signage.

Then you can start working on figuring out how to get it into place.
**Who** is going to see the signs? Are they outward-facing and primarily intended for paying customers or students? Are they inward-facing and meant to communicate with employees?

**What** are the signs intended to communicate? Is the primary purpose advertisement? Is it something highly specific, like the aforementioned price tags? Are they a **wayfinding resource**? Will they be presenting data, displaying schedules, or sharing internal memos?

**Where** will they be located—inside or outside?

**How** do you define success? What does a healthy ROI look like for you, and how will you be evaluating it? (Turn back to Chapter 2 for help planning this.)

You should be able to sum up your purpose and goals for the signage in a few short sentences. This will help your partner determine the best placement of the signage during the site survey which will ultimately make installation a much easier process.

**A Partner (Or Partners)**

Don’t worry, you're not on your own. For all but the most basic digital signage, it’s wise to work with system integrator, VAR, or reseller to assist in defining the best possible rollout strategy based on your individual needs. Some digital signage companies may offer these services via a third party as part of a holistic solution.

Your partner should have experience with the type of signage you plan on deploying, and be able to answer your questions to your satisfaction. They should be able to connect you with past clients, to discuss their overall experience and talk about their deployment.

They should also have a robust network of expert partners, such as installation partners and OEMs, who can work together and with you to make the best decisions about your signage.

If you’re bringing in any additional partners of your own, for example, you may be working directly with a designer. Based on your deployment you may want the content creators to have conversation with the CMS provider directly and the system integrator to ensure everyone is on the same page.

Let’s have an example of how a healthy network of partners can contribute to a better digital signage experience for all.

When a tourism center in Montreal, Canada wanted to deploy a digital signage system that would bring an immersive, interactive, video-based experience to its visitors, they brought several partners on right from the beginning\[142\]. Displaying the video in a way that would maximize its impact was key. After the video producers had created the concept, they shared it with the integrator. Based on the nature of the content, and the angle and location the tourism central wanted to mount the screens at, the integrator was able to recommend the exact screen that would best show the content off.

**A Plan**

Haste makes waste! You’re not ready to deploy your digital signage until you’ve planned each aspect.

This planning will also help as you budget for the project.

Most of the items in this section are covered more comprehensively in other sections, so we’ll touch lightly on each. Think of it more as a checklist and a reminder of what to consider as you plan each.

**The Components**

Of course, you’ll have to select all the components of your digital signage system in advance.

Your partners may be able to recommend components that will fit your needs and budget.

**Media Player**

How do you intend to update the content on your screens?

Gone are the days when you had to plug in a VHS player. Now, you can **update content wirelessly and instantly**, using a device like a Chromebox to stream content from the Cloud.

Something like an electronic price tag is probably RF-equipped. There are wired options as well.

Also recall that there are all-in-one choices, which integrate a media player and a screen into a single device.

For deep looks at media player options, check out chapters 5 and 7.
Display Screen
For a professional installation at an enterprise, or even SMB, you will want commercial-grade display.

Advantages of a commercial display include
- A three to five year commercial warranty
- Serious durability, with 60,000+ duty hours and the ability to stay on all day long
- Commercial grade components, including conformal coated circuit boards, that can survive dust, heat, and humidity
- Convection cooling—no noisy, bulky fans
- Anti-glare glass and ambient light sensors for increased readability from any angle

And much more. When choosing a screen, make sure to consider the amount of ambient light in the room and what sort of environmental factors (high heat? rain?) it’ll have to endure.

Turn back to Chapter 5 for much more information about types of screens, and ask your partners for advice in choosing the screen (and to see if they can get you a good deal).

See “The Placement,” below, for more about locating a screen and how that affects screen choice.

Content Management System
As you know by now, content is everything. Your screens aren’t there to hang like empty picture frames, after all.

Your CMS is the software infrastructure that allows you to bring content to those display screens.

Choosing one with the features you need will save you endless headaches in the future and help you use your signage to its full potential.

We cover CMS in-depth in Chapter 4, including features that are important for specific verticals, but here’s a quick reminder of the elements you need in your CMS.

- Support of the content file types you intend to use.
- Compatibility with other software you plan on integrating with your digital signage, such as Enterprise Resource Planning (ERP) software.
- User accessibility from any device, and the ability to set granular permissions for different users.
- Strong security features, like firewalls and encryption.
- High scalability, so that when you’re ready to expand your digital signage system, you can do it without difficulty—even if you’re going from ten signs to a hundred.

- And of course, the features that have to do with the content itself. You should be able to create content in the CMS itself, or use familiar programs to create content and easily upload it to the CMS. You should be able to schedule content to appear at certain dates or certain times. You should also be able to choose which content appears on which screens. The CMS should make content localization simple.

- Built-in widgets for weather, news, or social media feeds. If those fit the purpose of your digital signage, it’s much easier to use a built-in widget rather than trying to code your own.

You’ll need to decide between a CMS that “lives” in the cloud or one that runs from your own servers.

We recommend a cloud-based CMS with offline capabilities for most purposes. Why?

First, it’s worry-free.

You aren’t responsible for the cost and trouble of maintaining the servers. Security and software updates are managed by the CMS provider and downloaded automatically. In fact, the provider’s security system is probably far more robust than any you could muster.

Second, it guarantees easy access.
Since it’s on the cloud, you don’t have to be at the site of the servers to add content or modify scheduling. Just like you can log into your Google Drive account from any computer, tablet, or smartphone, you can access cloud-based CMS from anywhere.

Third, it ensures scalability.

You may have to purchase additional server space and software licenses, but you won’t have to worry about physically buying and installing additional servers to accommodate increased resource needs when growing your system.

There are certain situations when hosting your content and managing your devices using on-site server banks might make sense.

For example, Healthcare. Although one can argue that a public cloud may be more secure than that of an On-Prem solution, select industries such as Healthcare have additional steps required of CMS providers working in the cloud to ensure data security.

Mounting

The mounting positions the screen at a location and angle where it can do its job best.

- **Wall:**
  - **Flush:** The simplest type of mount. These position your screen on the wall so its back is parallel to the wall. You might find these in hallways or behind a welcome desk.
  - **Tilt:** This type mounts your screen at an angle. It might be useful if your screen is located above eye level, such as with a **digital menu board**.
    - **Articulating:** Articulating mounts place a screen at the end of an arm so the angle and direction it’s facing can be changed.
    - **Ceiling:** Rather than hanging from the wall, some screens dangle from above thanks to ceiling mounts. I’ve encountered them at airports—at the gates, there are often ceiling-mounted TVs playing the news.

- **Floor Stands:**
  - **Pedestal:** Pedestal mounts rise from the floor. In a large space with walls that are far away, and especially with interactive screens, these can be practical.
  - **Kiosk:** A kiosk encloses your sign in a casing, for aesthetic purposes or to protect it from the elements. They often cost more than basic mounts and may be built out of premium materials to provide visual appeal and greater protection for the hardware inside. They’re often designed for specific purposes. The screen and the enclosure may come as a “package deal,” but sometimes they can be purchased separately.

- **Specialty mounts:** This isn’t a discrete category. Specialty mounts are can take the shape of other types of mounts, but they’re built with highly specific purposes and environments in mind. They may use specialized materials, like antimicrobial plastic for a kiosk in a hospital. Or, an articulating counter mount in a retail location.

The Infrastructure

You may be adding your digital signage to an existing wifi or you may be running new Cat6 cabling. The use case, connectivity quality, content type, etc... are all determining factors for mapping your infrastructure need for digital signage. If you aren’t streaming all your content over wifi, you’ll need a robust cabling infrastructure[^1].

Work closely with your vendors to design a cabling system that you won’t regret later when you want to add additional screens.
For example, in K12 education in the US, most schools have the bandwidth of an average house, but have up to 200 students online. In a scenario such as this, the system integrator would want to select a CMS that could download or code bundle content during offline hours and then store it on the player device for use later to avoid fighting for bandwidth during busy school hours.

The Placement

Indoor, Outdoor, or Semi-Outdoor?

Don’t forget:

Indoor, semi-outdoor, and outdoor screens are very different from one another, each with special technology specific to its intended environment.

Commercial indoor screens might have dust-repellent casing, scratch-proof screens, heavy duty components, ability to be on 24/7, a cooling system, and more.

A semi-outdoor screen is indoors, but still exposed to direct/indirect sunlight. The LED semi-outdoor screens usually produce less light because there’s natural light in the room. They’ll usually have many of the same other features as commercial indoor screens.

Outdoor screens have special casing and specifications on how much light is omitted so you can still read it in direct sunlight.

They can continue working in extreme heat, cold, wind, etc... though outdoor screens still have limits to their operational temperature ranges, so make sure to check how much heat and cold it’ll have to endure at your location.

They may have waterproof coatings on their components and extra-tough glass to stand up to vandals and environmental forces.

Height and Distance?

This is another obvious one, but you still need to think about it, of course: Where will you be putting your displays?

You want to position your screen somewhere it will be seen by the maximum number of people to whom it would be relevant, at a place where it will be relevant. This, of course, ties back to your purpose in installing the displays.

For example, if you had wayfinding kiosks, you wouldn’t bury them deep in the heart of your mall—you’d position one at each entrance, and perhaps a couple at intersections of wings of the mall and the food court.

Watch the paths people take through your building and where their eyes are already glancing to determine high-exposure locations. Avoid odd corners and dead ends where people rarely look or wander.

Be sure to take into consideration the ADA height recommendations when placing interactive kiosks within your environment.

Angle

Depending on type of screen and location, you may need to angle the screen. LCD screens become less legible when viewed at an angle, so if you have one mounted high on a wall you might want to tilt it downwards.

Angle can also be addressed by selecting the appropriate screen. If you are in a call center and the viewing angle is not height related but side-view, viewability can be addressed by installing a brighter sign with higher contrast levels.

Light Exposure

Consider the ambient light at the location the device(s) will be installed. As discussed, different types of displays have different maximum outputs. You should also consider possible sources of glare, like nearby windows or spot lighting.

What Questions Should You Ask?

How Big is the Rollout and What is the Footprint?

I know, it’s a pretty basic question, but your partners will want to know, and so should you.

Are you looking at three signs in a single location, or 900 signs at 100 locations scattered across the United States?
As you’d expect, rollout for a large number of signs and locations will be more involved than a smaller deployment. Pulling together a heat map by zip code will help to determine logistical planning and rollout partner selection.

Consider one small step: the actual, physical installation of the signs. Just the signs. You may be relying on local contractors to do that. If each of your hundred locations are in different cities, it would be recommended to work with an installation partner that has either staff or contract headcount that can service a project with sites in numerous cities.

Keep in mind that rollouts that cross borders into other countries may require procurement within the given countries to ensure that the hardware warranty is covered within the region. It will also cut down in shipping expense and exporting paperwork. The larger the rollout, the more structured your planning must be.

Rather than leaving it up to the IT department in each location (which will lead to slight differences between locations and overwhelmed departments), you’ll want project supervisors at the regional and national level, some kind of centralized planning team, and possibly more.

Plus, there needs to be a clear line of communication between the individual locations and the planning team. Floor plans and internet availability might vary between locations, for example.

What’s the Timeframe?
Develop a timeline for deploying your digital signage, based on your own needs, but also information gathered from your potential partners and others in your industry about the timeline of similar projects.

Make sure to factor in time needed to choose components, make a plan for maintaining content, and create the first batch of content. Get regular reports from the team or teams involved in deploying the signage to make sure the project is on track.

You know the adage about how, out of good, fast, and cheap, you can pick two?

That’s also true when installing digital signage.

While rushing through planning and installation is possible, it’s costly. Not just in money needed to pay those designing and installing your system, but in mistakes and oversights that will need to be corrected later.

Do I Have the Necessary Resources?

Electric
You need to be able to power your signs and players.

Will your locations require significant rewiring in order to accomplish that? Are you likely to overload your circuit breakers? What kind of surge protection is in place?

Internet
According to a recent study of major banks using digital signage (typically in retail banking), 16 percent had difficulties providing sufficient bandwidth for their systems.

If you’re using the Internet or local VPN to stream your content, you may run into issues with your ISP, who often limit the amount of bandwidth each customer can use.

Learn your required bandwidth in advance, and get in contact with your ISP to see if your current plan can handle it.

Larger files require more bandwidth to stream.

Standard resolution video takes about 40 MB/minute, whereas high resolution footage (1080i) requires a whopping 140 MB/minute. Your content type the media player selected is key to support the highest quality content for your audience. For example: a media player with 16 gigs will be able to hold the equivalent to about 4 full length movies.

You may wish to invest in a private leased line connection which will allow you to monitor data flow and allocate bandwidth as necessary to high-demand links. This may also increase your data transfer rate, meaning smoother streaming.

Good news! If you’re using local playback, bandwidth will be less of an issue.
Local playback means that instead of the media player receiving a constant stream of content, the content is received only once and then cached on the media player for playback.

Most enterprise-level CMS will be able to schedule these content downloads for off-hours when the demand for bandwidth is low.

**Manpower**

Unless you’re a true one-person show, you won’t be the only one responsible for your digital signage.

Get your team excited about the new opportunities digital signage provides. You’ll want total buy-in and participation at every level to ensure success.

And I really mean at every level.

If the person at the customer service desk in one location decides that your advertising is too obnoxious to put up with for a whole shift, they might covertly mute or turn off the screen. That's potentially ad revenue lost, or customer confusion generated.

Additionally, recognize that while installing a digital signage network can bring benefits, requires support in the strategy, design, deployment, maintenance and so on.

If you don’t have enough manpower resources to allocate you'll end up with stressed employees and subpar content.

Providing sufficient training for those involved in the project and investing in user-friendly CMS will cut down on the difficulties in this area.

You may wish to allocate part of your budget for paying an experienced person to manage your digital signage.

Depending on the size of your network this may be a Content Champion/Manager, a graphic designer, and an IT support member for each location if running an on-premise network. Staffing models will vary by size of network, content requirements, and number of screens.

If it saves untrained and overworked employees from spending frustrating and fruitless hours troubleshooting simple problems, it may be worth it.

**What are the Details?**

As you work out your plan, make sure to assemble all of the information in one place.

You should have a master list that includes:

- The exact location each of your signs will go
- The angle and direction it’ll be mounted to face
- The model of the mount itself
- The model of each screen (and its size and any other relevant details)
- The type of content each screen will play
- The type of media players you’ll be using and how they’ll connect to the screens (velcroed to the back, hidden in the ceiling, or cabled to a media room 25 ft. or more away)

Aside from that, you should also record the rollout schedule, an itemized budget, your plan for maintaining the signs, and your strategy for producing their content.

**Do I Want To Do a Trial Run?**

The answer is probably "it depends."

For large, multi-location deployments, it’s wise to do a trial run in a select number of locations. You should also pre-define what the definition of a successful pilot is. Once the trial period is over, how is success going to be measured? The number of smiles? Sales? No downtime? You decide, but know the answer prior to the test or it’s not worth doing the test.

Any flaws in your planning should show themselves quickly when the project goes from paper to real life.

Plus, it’s a great opportunity to get feedback:

- From your employees, about how easy the signage is to maintain and control, or whether the content is obnoxious
- From your partners and vendors, about how to make the process of deploying go more smoothly at other locations
- From the customers, about what they like and don’t. Are the speakers too quiet? Is the screen hard to read? Is the touchscreen interface tricky to navigate? Is the advertising too intrusive?
And the above bullets might be your measurement of success! Make sure to apply the definition of success you designed as part of your purpose statement. You may have to adjust your goals.

Try to pick locations where the audience is representative of your average customer.

To Wrap Up

Are you reeling a little from the many things to consider?

I’d encourage you to think about your purpose in installing a digital signage system. As we’ve seen, it’ll inform your strategy and decisions in most of the other areas.

With a solid purpose in mind, and good information about your options (found here in this guide, gathered from your provider, or read elsewhere on one of the many Internet resources), the rest should fall into line.

Enjoy your effective signage!

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CHEAT SHEET FOR YOUR Digital Signage Rollout

Make sure you track the following...

1. The exact location each of your signs will go
2. The angle and direction it’ll be mounted to face
3. The model of the mount itself
4. The model of each screen (and its size and any other relevant details)
5. The type of content each screen will play
6. The audience for each screen
7. The type of media players you’ll be using and how they’ll connect to the screens

Aside from that, you should also record the rollout schedule, an itemized budget, your plan for maintaining the signs, and your strategy for producing content.
10 Digital Signage Trends You Need to Know Before Buying

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Keep Up with Digital Signage Trends

If you’re old enough to remember the first lunar landing, you’re old enough to have witnessed the entire development of the digital signage industry—and what an incredible rise it’s been.

Back in the seventies, long before the arrival of the modern Internet, enterprising shop owners played VCR tapes on televisions to attract customers. Of course, all content had to be prerecorded, not to mention rewound once you reached the end of the tape.

Today, however, is another era. With the industry’s rapid growth and the continued accumulation of promising data about the usefulness of digital signage, you might even call it a golden era.

Recent years have seen the arrival of crazy technologies like glasses-free 3D signs, interactive digital personal assistants, and absurdly high-resolution 8K LED displays. But not every exciting new gimmick is widely adopted in the market. And in a rapidly evolving industry like digital signage, it’s vital to stay on top of emerging trends to keep your approach fresh.

In this chapter, we’ll teach you how to tell a trend from a gimmick, and give you an insider’s perspective of what today’s trends really are (so you can hop on while they’re still fresh!). Get your PDF here.

How Do You Spot a Trend?

The digital signage industry has always been ahead of its time.

Here’s what I mean by that.

If you read coverage of major digital signage trade shows, like Digital Signage Expo, you may see any number of technologies labelled as trends, because multiple companies featured them in displays.

But that doesn’t mean those technologies are true digital signage trends! It just means they’re trendy to show off at trade shows.

Think virtual concierges, for example. They’ve popped up multiple times in digital signage trade shows. But have you ever seen one out in the real world?

Much of the futuristic tech exhibited at trade shows is just that: futuristic. Speculative. While it’s cool to see what technology is capable of, it’s unproven.

It typically takes a number of years between a technology’s debut in the trade show and true market penetration. This has been true from the earliest days of the digital signage industry.

Plasma screens came into use in digital signage because they were easier to ship, store, and set up in trade shows than the previously used CRTs. It took a while longer before retail and other industries adopted plasma screens.
Sure, holograms might be the next big thing. If you have the money to spend and want to bet on a technology in hopes of keeping up with the bleeding edge of digital signage tech, more power to you.

But most corporations and individuals don’t have the funds to risk. Most want to be on-trend, without taking on an unpredictable level of financial risk.

**To find real trends, you have to watch the market.**

Be aware of what technologies are actually being adopted in your vertical.

Watch digital signage news and industry blog sites, such as Digital Signage Today and Sixteen:Nine.

Set up a Google alert using **key terms** like “vertical name” + “digital signage” to spot the latest big rollouts.

During your preliminary research period when planning digital signage, ask digital signage providers what’s really selling.

Don’t just gravitate toward whatever looks flashy.

**The 12 Hottest Trends in Digital Signage**

1. **Interactivity**

Digital signs are inherently more attention-grabbing than a traditional static sign. Thanks to recent technologies, digital signs can be even more engaging to customers and viewers—in fact, they can be interactive, I’m not just talking about interactivity via a touch screen, but turning viewing into a personal experience.

*Retailers, especially, have a strong interest in increasing impressions made,* and this year will doubtless see increased efforts to include interactive elements in digital signs.

One major area: the use of beacons, particularly Bluetooth Low Energy-enabled ones. Beacons detect the proximity of people with the right app installed on their smartphone and broadcast their identity to the app.

The app then queries a server which sends personalized information back for the user. This could be something like a coupon.

If you want a more in-depth explanation, check out this article on beacon technology.

But what if you add a digital display to the mix? A customer could walk into your store and be greeted by name on a screen, or offered targeted advertising based on their shopping history with you.

Interactive projectors are another big possibility here. Customers can play simple games, and so much more.

Interactivity is a major element of wayfinding stations as well.

Interactive kiosks are big, too. Let customers browse digital catalogs, learn more details, and view different color and size options on items. A “compare items” option, which displays specs side-by-side, can be especially useful.

*Putting this information at customers’ fingertips empowers them to make a more informed decision.* It also frees up your staff to provide hospitality and complete other tasks, rather than just reciting information.

Plus, it gives you more opportunities to upsell: the kiosk can suggest other related items and optional features, or be used for advertising when not actively being browsed by a customer.

2. **Facial Detection and Characterization Software**

Facial recognition sounds a little “Big Brother is watching,” doesn’t it?

But we’re not talking about software that can recognize individuals. That would be a little creepy, and would probably make your customers concerned for their privacy.

Rather, facial recognition is part of the larger trend for leveraging data to tailor ads to specific audiences and maximizing their effectiveness.

Facial detection software recognizes and focuses on the faces of people who pass and pause in front of the sign.
Then, **facial characterization software** makes a guess at the age, gender, and racial demographic of the user and takes note of the content they viewed, how closely they approached the sign, and how long they spent watching. You can then take that data and learn how well your signage is doing in reaching your customers, and tweak your content accordingly.

For example, if it became clear that your Millennial-aged customers preferred video content to static pictures, and this is the demographic you were hoping to target, perhaps it would be time to invest more time in producing videos.

Again, the data of individuals isn’t saved, only collected in aggregate. Your customers’ privacy is preserved.

There’s even facial recognition software to help signs recognize the gender and age of viewers and display appealing content for their demographics.

**3. RFID Tags**

RFID tags use electromagnetic fields to track and identify tiny tags embedded in objects.

Ever taken your pet to be microchipped? That tiny transponder inside your pooch is an RFID tag. But RFID readers in digital signage aren’t there to read Fido’s address. Instead, they’re being considered for a whole variety of applications. For example: You can now RFID chip products such as perfumes, layer demographic information collected via facial recognition as discussed above and then have visuals and messaging appear on the display targeting the appropriate demographics.

**Retail**

RFID tags can be used on items like high-end clothing.

Bringing an item near a kiosk, or into a virtual changing room (see #7 below) can trigger signage to pull up information about the item, to showcase upsell or cross selling of accessories, jewelry, or shoes, and maybe even let you virtually try it on!

RFID tags can also be used to **track stock and prevent shrinkage.** A great use case for tracking stock in for shoes. Many times the box is misplaced or put back with the wrong shoe run. Chipped boxes let associates know exactly where the item is in the back room.

If all items in a store are equipped with RFID tags, you know where each item is, exactly how many of an item have been sold and how many are left.

**Hospitality**

The Hyatt Regency Chicago embedded RFID chips in guests’ card keys.

When a guest checks in, information about the guest (such as if they’re at the hotel to attend a particular conference) is stored in the system.

If a guest approaches a sign, the RFID reader in the sign detects the key card, retrieves guest characteristics from the server, and displays relevant information. For example, it could direct the guest to the next conference event, or pull up a customized itinerary.

**4. Social media**

In 2016, it would barely be an exaggeration to say that everyone’s on social media.

With 74 percent of all adults on the Internet and 81 percent of all small and medium businesses in America using at least one social network, odds are that both your customers and competitors are making use of the medium.

Social media is a great way to drive customer interaction and loyalty, and it will be even bigger than ever this year. It’s time to **bring it to your digital signage networks.**

It’s possible to introduce social media interaction in a big, flashy way.
In 2015, Coca Cola launched its “What’s In a Name” campaign\(^{[153]}\). If you tweeted your first name at Coke with the hashtag #CokeMyName, Coke’s giant Times Square digital billboard would display a fun fact about your name within two minutes. In a different phase, tweeting your name to the soft drink would trigger the billboard to display a one-sentence story about you. A webcam set up across the road would snap a picture of the billboard, and Coke then tweeted it back to the original person. (That way, even people not physically present at Times Square could participate.)

The campaign was a media hit, and people from all over the world participated.

**However, you don’t have to get that elaborate with your integration.**

Thank goodness, because Times Square billboards can cost $1.1 million to $4 million a year to lease\(^{[164]}\).

Many CMS include simple widgets for social media. Simply dropping it into place and logging in with your social media account will allow you to display your Twitter, Facebook, Instagram or other feed on your digital signage.

Want to make it interactive?

Create a hashtag for your viewers to use, and promote it on your signage. When customers share using that hashtag, retweet or share selected posts into your own feed. Then they’ll be able to see their own words on your signage.

It’ll help your viewers connect with your brand on a more personal level, but don’t worry, filters and pre-approvals will keep the negative or tacky messaging off your signs.

**5. Mobile integration**

*Mobile integration* is closely tied to both interactivity and social media.

As of 2015, a full 68 percent of US adults owned a smartphone or tablet\(^{[165]}\). People are ever-more accustomed to interacting with the world through the filter of their small screen.

The near future should see retailers, in particular, looking for new ways to take advantage of that with digital signage.

For example, a digital sign might display a QR code for a customer to scan in order to receive a special offer. Be aware, however, that QR codes are losing popularity, and scanners tend to be men\(^{[156]}\).

Consider including the option to simply text the offer to the customer’s mobile phone, rather than scanning.

This year, screens which can read Apple Pay-enabled phones\(^{[157]}\) for ultra-convenient payment will debut on the U.S. market. All a buyer would need to do is hold their phone against the screen for a few moments.

A customer scanned a QR code, then entered the three-digit code on the digital signage screen. This synched their phone to the screen. The software powering the experience used the phone’s motion detection capabilities.

By swinging their phone, a customer could try to nail the perfect tennis serve.

Completing the game allowed customers to enter a giveaway for Rogers Cup tickets.

**6. Ultra-HD displays**

8K displays like the one displayed at this year’s Digital Signage Expo are going to be out of most people’s price range for a long time.
But there’s another uber-crisp option that, this year and in coming years, should be a more realistic option than ever before.

4K displays have four times as many pixels per square inch than full-HD, 1080p screens. They also offer high dynamic range and excellent color fidelity.

When first introduced, these screens were absurdly overpriced and seen as a mere gimmick. How much difference could a few more pixels really make?

Over the course of 2015, an increase in options available (thanks to OEMs picking up on 4K as a high-potential market) led to an abrupt drop in prices, and a rise in the availability of high-quality features made 4K displays an attractive and affordable option.

In fact, with a bit of luck, you could snag a giant 60-inch display for as low as $800.

Too pricey?

Consider tiling a number of smaller screens in order to achieve a similar effect for much less dough.

Your content management software can help you synchronize the content in a pleasing way.

A recent study suggests that the Ultra-HD panel market (which includes all screens) will grow $44.4 billion by 2024. The digital signage market segment will help propel that growth, with a projected compound annual growth rate (CAGR) of 11.7 percent.

You should be seeing them pop up in the hospitality and retail sector, especially in industries where presenting a sleek and high-class image is essential.

7. Digital Mirrors

Digital mirrors work by using rear or edge projection to superimpose images onto a mirror.

The concept of a digital mirror has been around since the mid-2000’s or so. They’ve served as a fun publicity-grabbing advertising campaign centerpiece for everyone from Pepsi to sporting venues.

While they still make up a small sector of the digital signage market, they have the potential to really break through in upcoming years (and not in the seven-years-bad-luck way!).

One reason: the actual software and hardware powering digital mirrors has improved. Early displays were limited by dim images and restricted viewing angles, not to mention lag when trying to make adjustments to an image in realtime.

Recent offerings from the likes of Samsung have addressed these problems. Powerful software and processors allow digital mirrors to manipulate 3D models (like clothes) in real time.

Another reason: There are more ways to integrate digital mirrors with other tech strategies.

Retailers such as Macy’s have had great success in marrying digital mirrors and social media with campaigns like Magic Fitting Room.

These touchscreen mirrors allowed shoppers to choose clothing, which would then be superimposed over the shopper’s image.

Customers could even alter the color or size of each item with a couple swipes.

The shopper could then share the outfit to social media to get their friends’ input.

RFID tags (see #3) can be attached to clothing so that the items are automatically pulled up on screen—no need to make manual selections.

Motion sensors suggest another potential use.

Digital mirrors can be used to display messaging (say in a restroom or at a cosmetics counter).

Then, when someone moves close enough, the motion sensors can trigger and clear the advertising so the mirror can be used.

8. ePaper

ePaper is a relative newcomer to the digital signage market, but it shows significant promise in retail applications.

You’ve probably seen ePaper in use in e-readers before. The screens have a matte finish and aren’t illuminated.

For the scientifically curious, here’s how they work:
Most are classified as electrophoretic displays. Inside the screen, tiny microcapsules are filled with dark-colored oil and electrically charged white particles.

Electric fields either send the particles to the front of the capsule (turning the microcapsule white to the viewer) or the back (turning it black).

These displays are generally limited to black-and-white or grayscale, and are usually small—think e-reader or price tag sized, however a number of companies are developing and testing color readers.

Larger sizes are very expensive. They have a relatively low refresh rate, so they wouldn’t be good for showing video.

However, they can maintain a fixed image on their screen without consuming any energy—some can last up to three years on a single battery pack. They are high-contrast, impervious to ambient light; and unobtrusive.

Because they can be updated instantly, they could be an ideal substitute for something like price tags or conference room schedules.

Plus, they have a clean, minimalist look. ePaper could give the opportunity to swim against the “flashier! More colorful!” current and distinguish yourself, while still gaining the advantages of digital signage over traditional.

9. Indoor LED

We’re not talking about outdoor LED billboards here. This year should see an increase in prevalence in LED screens indoors.

Industry insiders are predicting that this year will bring a flood of affordable indoor LED options to the market, thanks to recent acquisitions by giants such as Samsung, and traditional display manufacturers expanding their product lines.

This will mean not only better prices, but a greater variety of sizes and shapes. Get excited, because LED screens have a wide variety of advantages.

LED screens can be almost any shape and size, even wrapping around pillars. They can also be incredibly thin. Some models are only a few millimeters deep. There are also bezel-less options.

They’re energy-efficient and long-lasting: perfect for creating eye-catching displays without bloating your energy bill.

LED screens are sharp and crisp.

Not only that, but they offer incredibly rich colors, and, thanks to the ability to dim individual LEDs to lower light output levels, greater contrast levels than traditional LCD screens[165].

10. Indoor Video Walls

Indoor video walls aren’t exactly new tech. They’ve been on the scene since the eighties. Here’s the thing, though: they’ve stayed hot. They still stand out and make an impression.

Well, how could they fail to? It’s a whole wall of synchronized displays.

A tiled video wall will typically cost less than a single screen of comparable size, and they offer a greater variety of configuration options for oddly shaped spaces or for displaying content with unusual aspect ratios.

Today’s tech makes it easier to deploy an awesome video wall than ever.

When video walls first debuted in the eighties, the great challenge was synchronizing the content on the screens. Those wishing to use them had two options: One, use computer processors to split and synch the signal—which, in those early days of computing, were prohibitively expensive.

Or, two, contract a video production company to divide up the content in advance, load the content onto LaserDiscs, and then play the discs on separate players attached to each TV.

Today, splitting a signal among multiple screens is simple.

The screens don’t even have to make up one single picture: you can have zoned content.

(Don’t get too wild, though—if you have too much going on at once, your viewers will be overwhelmed.)
The other big challenge to video walls is dealing with bezels—the strips of plastic or metal that frame the screen. While they’re pretty unobtrusive if a sign is by itself, bezels get obvious when they’re cutting right through your content.

There are a number of bezel-less, or very nearly bezel-less, options out there, in a variety of sizes.

11. **3D**

If you’re like me, you might think of 3D as too absurdly futuristic to actually stick.

Some types of 3D displays, like holograms, simply aren’t practical to implement, due to high costs, limits in image quality, and sensitivity to light levels and viewing angle.

That isn’t to say that digital signage companies aren’t dabbling. In the Netherlands last year, a graphics design agency turned its focus to 3D holographic display cases[166]. They’ll be promoting them for use in everything from advertising in malls to use as showpieces at trade shows.

Widespread adoption, however, is unlikely.

But consider this.

VR is breaking into the mainstream with Google Cardboard, Samsung Gear, and the much-hyped Oculus Rift. Glasses-free 3D entertainment is available in the form of the Nintendo 3Ds and, very soon, 3D televisions[167].

It’s even made its way into the digital signage sector.

Norway’s fifth-largest company installed an entire autostereoscopic (that is, 3D without the use of special glasses) video wall in its operational center last year[168]. The wall is over 10 feet wide and eight feet tall, and is essentially the first of its kind.

While wide adoption of 3D tech in digital signage might be a way off, it’s not too soon to start thinking about how you can use it. Virtual tours? Product demos[169]? The possibilities are pretty cool.

Sure, right now, it’s more of a gimmick… but it’s a gimmick with a lot of potential. Early adopters should keep their eye on 3D tech.

Whether it becomes mainstream or if it remains in the “cool toys” category, time will tell.

12. **Digital signs everywhere!**

Is it a cop-out to call digital signage itself a digital signage trend?

Well, maybe a little bit.

But I’d argue that filling new niches and finding a place in new verticals has been a “trend” in digital signage ever since it first came into use.

Think about it. At its inception, digital signage was relegated to replaying runway shows at retail outlets. Then the banking industry picked them up… and casinos… And now they’re absolutely everywhere.

With the market growing steadily, it shouldn’t come as a surprise that this indicates more digital signage, everywhere, for everyone.

You’ll be seeing more digital signs in restaurants, in retail locations, in offices, in schools (2,000 universities installed digital signage networks in 2011, and that number has continued to grow)…

And you’ll be seeing them used for an increasingly wide variety of communication and interaction purposes.

**New Applications**

For example, in 2015 McDonald’s introduced a new custom burger option at select west coast stores before bringing them to locations across the nation[170].

What makes it unique? Digital signage. Customers choose buns, meat, and toppings using a touch-screen kiosk and pick their creation up at the counter.

Just the other day, I nearly had a heart attack when a digital endcap chocolate display at a store whispered “Indulge yourself” in a sultry voice just as I walked past.

A college I visited recently had an LED stock ticker on the wall in the business department.
Integration
Integration is everything today. Not only will you see digital signage in new applications, you’ll see it in new combinations.

Digital signage can now be part of a complex, multi-part system involving multiple pieces of hardware and software working together to deliver a result.

No matter who you are and what kind of business or other operation you have, there’s some way for you to make digital signage work for you. Be on the lookout for new ways to make use of it and the unique advantages it offers.

You may end up setting a trend of your own.

To Sum Up…

It can be hard to predict the future, especially in an industry like digital signage, which is characterized by rapid growth and quickly evolving technologies.

However, we can guess with some certainty that the biggest trends of today are focused on integration of digital signage.

Rather than an afterthought or a separate effort, it’s going to become more deeply linked to all aspects of connecting with and serving customers.

It’ll be used for more diverse purposes and linked up to social media.

This increased immersiveness will be aided by emerging and increasingly widely available tech like high-resolution LCD and LED screens.

It’s an exciting time in the digital signage industry. A good time for you to start planning!

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6 BRANDS THAT IMPLEMENTED
the Hottest Trends in Digital Signage

1. Interactivity
One of the first measurable success stories in beacon technology comes from Hillshire Brands when they saw a 20% increase in purchase intent. In April and June of 2014, it used the beacons in grocery stores in major US cities to advertise its American Craft sausage. They targeted shoppers who had downloaded one of several apps which worked with the technology, including Epicurious and Key Ring.

2. Facial Detection and Characterization Software
Tesco rolled out facial detection to better analyze their demographics. For 450 locations in the UK for this gas station chain, this is a big deal. Initial concerns were over privacy, but the system doesn't collect any facial patterns, rather the age, gender, and ethnicity so they can tailor ads through their ad network.

3. RFID Tags
The Hyatt Regency Chicago embedded RFID chips in guests’ card keys.

When a guest checks in, information about the guest (such as if they're at the hotel to attend a particular conference) is stored in the system.

If a guest approaches a sign, the RFID reader in the sign detects the key card, retrieves guest characteristics from the server, and displays relevant information. For example, it could direct the guest to the next conference event, or pull up a customized itinerary.
4. Social Media

In 2015, Coca Cola launched its “What’s In a Name” campaign. If you tweeted your first name at Coke with the hashtag #CokeMyName, Coke’s giant Times Square digital billboard would display a fun fact about your name within two minutes.

In a different phase, tweeting your name to the soft drink would trigger the billboard to display a one-sentence story about you.

A webcam set up across the road would snap a picture of the billboard, and Coke then tweeted it back to the original person. (That way, even people not physically present at Times Square could participate.)

The campaign was a media hit, and people from all over the world participated.

5. Mobile Integration

In 2015, the National Bank of Canada celebrated the Rogers Cup tennis tournament by letting customers play tennis using their smartphones. Here’s how it worked.

A customer scanned a QR code, then entered the three-digit code on the digital signage screen. This synched their phone to the screen. The software powering the experience used the phone’s motion detection capabilities.

By swinging their phone, a customer could try to nail the perfect tennis serve.

Completing the game allowed customers to enter a giveaway for Rogers Cup tickets.

6. Digital Mirrors

At Nordstrom in Chicago, a touchscreen dubbed the ‘Digital Denim Doctor’ allows buyers to enter their body shape, type of preferred fabric, and other key points to create an algorithm that displays a 360-degree view of how the jeans will look on the user’s body.

The best part?

Users love it.

Because they love it, they’ll tell their friends about the super-cool digital mirror that put pants on them without hands ever touching them. Their friends will come in droves to check it out.
Thanks for reading the Skykit Digital Signage Guide.

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