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FUTURE PROOFING YOUR DIGITAL SIGNAGE?

Yes, but the Future is Here Now

By Alan C. Brawn CTS, DSCE, DCME, DSNE, DSDE, ISF-C

Future-proofing is the process of anticipating the future and developing needs of a system and accounting for and minimizing the effects of shocks and stresses brought on by future requirements and changing events and conditions. This concept is commonly found in electronics, data storage, and communications systems and certainly applies to digital signage.

Here are some suggested questions to be considered in terms of future proofing:

- Does it meet future requirements?
- Is there flexibility to expand?
- Is the system adaptable, and programmable?
- Is it scalable and embeddable?
- Is it applicable for variable technical environments?
- Is the architecture modular?
- Does it provide interoperability?
- Is it updatable within the system?

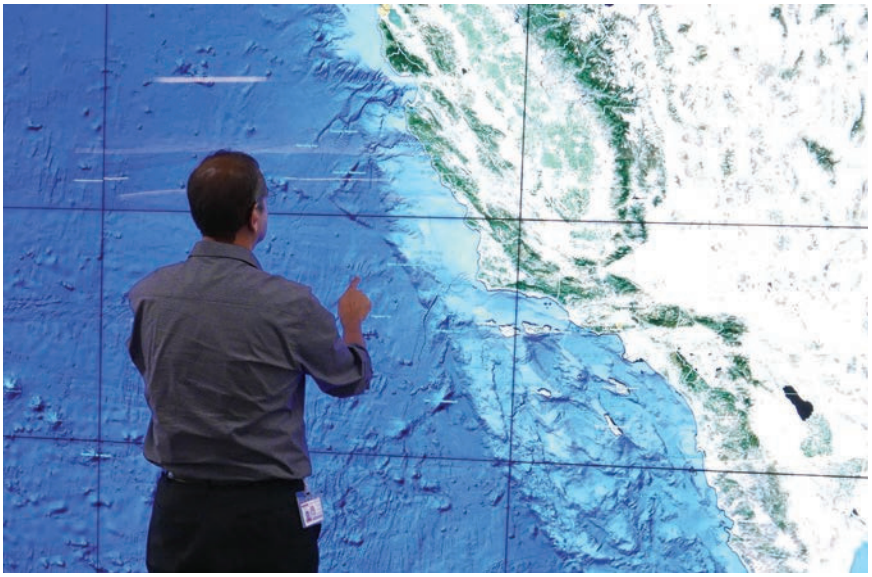
Future proofing is based on the fact that it is not economically viable to replace each system when changes in the network operations occur. System designers need to focus heavily on the ability of a system to be reused and to be flexible to continue to acceptably compete in the marketplace.

In fundamental terms, future proofing can be thought of as a step by step process:

1. Identify your business goals, strategies, objectives, opportunities, and risks
2. Align your technologies in terms of resources and best practices
3. Deliver best of breed solutions, implementation, and outcomes
4. Optimize cross functional support, maintenance, service delivery, and budgets
5. Realize benefits such as revenue growth, greater profit, lower risks, higher utilization, and better ROI.

For this report, we reached out to an eclectic group of friends and colleagues with the common denominator that they are all digital signage geeks and are considered subject matter experts. From displays all the way to extended warranties, here is the list of things to look at and what our subject matter experts had to say.

4K Resolution: Basically, all major manufacturers now offer a complete line of 4K display products, but when you look deeper, they still focus on 1080P resolution products. 4K is rapidly growing in demand, as we are increasingly viewing larger displays from a much closer distance, where the benefits of the higher resolution are appreciated. Videowalls are an especially beneficial application, and now most internal processors can accept 4K resolutions, making the images sharper and clearer. This is truly apparent in digital signage, which more projects now requiring 4K, due to end user demand (sometimes even if there is no appreciable benefit, just for buzzword value). Digital signage can avoid many of the signal transport issues that trouble 4K resolution adoption elsewhere, as the players often are located at the display. If signal extension is necessary, there is enough maturity in the product market to provide it. Both PC and Android based media players now can drive 4K readily, and at an affordable cost. 4K displays also now have excellent scalers, allowing adapting lower resolutions, such as 1080P, without degradation. Costs for 4K display devices are down, and will continue to drop.



Ultra-thin bezels: The "holy grail" of flat panel displays and videowalls specifically is to reduce the mullion or bezel around the flat panel display to as near zero as possible. Seamless is in. In some instances, a bezel may be a design benefit and act as a frame of reference on a display, yet in others it is a distraction. This is especially true in videowalls or where you want a minimalist approach for interior design. What prevents a true zero bezel is the nature of LCD pixel structure and the need to have circuitry surround the individual pixels in the display. The top and left bezels are thicker in a flat panel display because of the LCD signal ribbon control cable for the column and line drivers of the display. As the bezels get thinner, the flat panel edges become more susceptible to damage and of course the thinner the bezel the higher the price of the panels due to manufacturing costs. Only a short time ago a typical bezel width was 5.5mm but today the average is 3.5mm and the thinnest bezel is 1.7mm. Selecting the proper bezel width today will prevent the display from looking out of date before its time.

Display calibration and matching displays: Experience teaches us that most displays are taken out of the box, installed/connected and turned on. In the "out of the box" mode, they tend to look fine, at least initially, to the untrained eye. Displays are preset at the factory with basic settings of color, contrast, and brightness. What they cannot predetermine is what source material or content will be played on them nor the environment in which they will reside. Herein lies the problem and the requisite need for display calibration. Calibration is the process by which the color space or gamut is set relative to the desired white level such as 6500 degrees Kelvin or D65, as set by SMPTE and the DCI. There are different color spaces to consider such as sRGB, Adobe RGB, or DCI P3 and they are used for different applications. One size does not fit all and there is no magic automated process to push a button to make this happen. It is full display calibration that is needed. The goal of calibration is to accurately represent the source material as it was created. If the content is showing a bright red can of soda, the display needs to replicate that color exactly. The good news is that all displays are capable of calibration and what is unknown to many, is that the top providers include calibration software with their displays. Some manufacturers even offer matched displays coming out of the factory for videowalls but even in those cases, some calibration is necessary. Proper calibration may require a separate colorimeter to fully calibrate a display but the good news is that these instruments are available and inexpensive. The end results will be worth the effort.

Better system on a chip (SoC) technology: As we know, content is the vehicle that delivers the message in digital signage. As content becomes more complex with higher resolutions and more streaming media, more bandwidth is required. This migration also requires more "horsepower" in the media players that deliver the source material. Over the last few years the concept of system on a chip (SoC) has come onto the scene. In the early days, there was a disconnect in the capability of those early SoC platforms versus the source requirements. In short, they were not robust enough for higher performance applications. What some may not realize is the SoCs embedded in some displays are getting more robust with better quad core processors and more memory. This qualifies under the heading of taking another look.

Videowall processors-built in: We know videowalls are all the rage. What some don't know is that most flat panel displays have basic videowall processors built in. Sounds good but it is critically important to understand what these processors aka daisy chain scalers, can and cannot do. For daisy chain scalers, a single source is connected to the first display, and then daisy chained using digital video male to male cables to the other displays in the wall. Daisy chain processors are designed to handle only the native resolution of a single LCD, today typically 1920x1080. This means that the wall will display a scaled up single 1920x1080 image stretched across the entire wall. Here is the caveat. These built-in processors do not provide sizing, rotation, or other configurations and are limited to the same number of monitors both horizontal and vertical (i.e. 2x2 or 3x3). Nonlinear configuration will distort the image (i.e. 2x3 or 4x6, etc.). If this fits your current and future needs, then this is a good solution but if you need more…

Distributed Visualization Processing: If more sources, special effects, and nonlinear sizes are required, then take a look at what is known as a distributed visualization system. The basic operational principle of this type of videowall processor is the same as old dedicated hardware processor, but replaces the single proprietary hardware chassis with a modular network based configuration. This removes the limitations on installation and distance for standard video cables, and eliminates the need to use baluns. This also allows for a truly scalable solution, that can add as many inputs and outputs as required. Software based versions of distributed visualization are available and have the advantage since they dispense with the proprietary hardware in favor of using common, off-the-shelf computer components, connected to the same type of network backbone. Software systems provide expanded and upgradeable features, using software installed on each computer device for encoding, streaming, or rendering video. These systems can be scalable to nearly any size, and are more cost effective, due to the inherent nature of their design.

Direct view LED technologies: We live in an ever-expanding world of LED illumination. There are car headlights, home light bulbs, flash lights, etc. and solid state illumination applications are everywhere. We have evolved from discrete LEDs with limited color choices to surface mount versions and infinite color selections. Over the years, direct view LED has dominated outdoor displays. Those of us lucky enough to leave in proximity to Las Vegas have witnessed outdoor displays along the strip migrate from >24mm pixel pitch, to 18mm, and then all the way on down to 10mm. In terms of pixel pitch, as it has gotten smaller (tighter), the images have improved to the point that they look good at long distances as well as close-up. As a side note, when in Las Vegas,

the old screens really look bad in comparison. The real disruptive change in direct view LED has been in the sub 10mm panels with indoor displays. The indoor pixel pitch competition is now being played at 4mm and below with the current champion at .8mm. Yes, below 1 mm for those with a calculator and good eyes. I can vouch for the outstanding results at the Westgate Sports Book and their massive curved wall and it is a 2mm design. At 30' away it looks as good as my 70" flat panel at home.

Display Mount Options: When it comes to choosing the correct mount, turn away from the traditional wall mounts that require considerable pre-assembly, can be bulky, costly to ship and limit the ways in which you can configure or orient the displays. Turn instead to a fast, hassle-free installation, cost effective, and versatile AV mount solution for your digital display. A smart way to future proof your AV mounting option is to install a mount that allows for easy servicing when needed. A press and release pop out mount features a revolutionary latch that allows for the precision adjustment of a digital display position instantly. The benefit being that the user can maximize their up time when performing maintenance on the digital display. Another way to future proof your mount is to choose a mount that provides an option for video walls and digital displays to be positioned flat or up to 15 degrees so consumers can view content at the perfect viewing angle. With these considerations in mind, choosing the right mount will result in an effective AV mounting solution with the future in mind.

HDBaseT: Signal management and distribution has evolved from the analog world to digital and with this evolution comes some new challenges and new opportunities. The resolution in Digital signage signals continues to increase while at the same time the distance to distribute/extend has been reduced. The most prevalent answer to this conundrum has been the introduction and utilization of HDBaseT™ technology from Valens. This technology allows 5 signals to be distributed over a CAT5 cable – uncompressed HDMI, Audio, USB, Control (RS-232, IR), 100MB Ethernet and power. One way to futureproof, you will need to make sure you are using the appropriate cable for the class of HDBaseT you are using. Figure 1 shows the current classes and required cable.

For more information on HDBaseT™, you can visit the HDBaseT™ Alliances website.

Another consideration when futureproofing your installations with HDBaseT™ is to make sure the components you are using are HDBaseT™ certified. The protocol can be implemented differently by the manufacturers playing in this space. Certification is one way to help insure compatibility and protect your signal management investment.

Beacon technologies: If you are not familiar with beacon technologies, you soon will be. Beacons are technology used to trigger content or messaging on mobile devices as a user passes through an environment. A beacon typically uses Bluetooth Low Energy (BLE) proximity sensing to transmit a universally unique identifier picked up by a compatible app or operating system. The identifier and several bytes sent with it can be used to determine the device's physical location, track customers, or trigger a location-based action on the device such as a check-in on social media or a push notification. Here is the payoff. Beacons offer the potential to target a customer at the most opportune moment to influence buying decisions. Retailers can provide personalized experiences to customers. Brands are no longer limited by shelf displays and point of sale campaigns to communicate their messages. Brands can extend past the sales floor to deliver personalized outreach. Customers often pay more attention to their mobile devices, than anything else around them! Beacons are affordable and available today and their use will certainly expand as we understand more of what they can do.

IP streaming: As we mentioned earlier, signal distribution in digital signage has evolved from the analog world into a digital one. Another choice, being utilized for moving signals from players to screens is IP Streaming. IP streaming usually involves a encoder, compressing a signal using one of several protocols available on the market today, and a decoder which takes the data signals and converts back to video. Two popular protocols for compressing data is H.264 and JPEG2000. The difference between the two protocols boils down to band width and latency. JPEG2000 using more band width and has less latency and usually requires proprietary equipment on both sides of the extension. H.264 requires less bandwidth, has a little more latency than JPEG2000 and can use disparate manufacturer's products on the decoding side, if they are compatible with H.264. Futureproofing with IP Streaming really boils down to making sure the network you implement is robust enough to handle the bandwidth of the content you are disseminating.

As we said at the beginning, future proofing a system is about digging a little deeper up front in planning and due diligence. You will be well served by anticipating the future and developing needs of a system and accounting for those needs, thus minimizing the effects of shocks and stresses brought on by future requirements and changing events and conditions. The age-old admonishment is true; "Do not be penny wise and pound foolish". It makes little sense to spend dollars today to just have to turn around and have to spend more dollars tomorrow which should have been accounted for in the beginning. Our list of considerations is by no means exhaustive but it does give you a place to start and questions to ask.

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