DIGITAL SIGNAGE
A Guide to Maintenance, Repairs, Upgrades, and Replacements

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Table of Contents

Hardware Maintenance.................................................................1

Preventative Care, Maintenance, and Upgrades of Equipment..............1

Average Lifespan of Equipment....................................................2

Software Updates ........................................................................3

Most Common Problems..................................................................3

Security Dilemmas..........................................................................5

Average Cost of Service ..............................................................5

Average Time Needed ....................................................................6

Cleaning and Repairs ...................................................................6

Conclusion .....................................................................................7
Hardware Maintenance

Digital signage is rapidly replacing printed displays in restaurants, retail stores, medical facilities, entertainment venues, business offices, and on college campuses. The technology provides static and dynamic content that creates engaging experiences for patrons and employees, as well as cost-effective solutions for businesses. Whether these signs are used purely for entertainment, as a way to educate, to display information on products and services, or for helping patrons reach their desired location, digital displays play a crucial role in today’s technologically advanced world. To get the most out of your digital signage and provide the customer experience and business efficiency you’re looking for, the signage needs to be kept in superb working order. The technology will require regular maintenance, repairs, and replacements; so, this manual will serve as a guide to these services for management and IT teams looking to keep their digital signage systems running optimally.

Preventative Care, Maintenance, and Upgrades of Equipment

Tips for preventative care:
- Train employees on proper use and cleaning of equipment
- Regularly clean screens, wipe down media players, and dust behind/around the digital displays
- Inspect cables and power cords for wear and tear

What routine maintenance should be implemented?

Power cords and cables connected to media players should be checked for fraying and improper connectivity on a regular basis. If using LCD screens, bulbs within the screen may burn out and need to be replaced. Additionally, screens should be wiped clear of dust to ensure optimal viewing quality and prevent debris from plugging up ports and damaging sensitive internal components. Media Players will need to be connected to the network and monitored for hacks if content is downloaded wirelessly, otherwise external hard drives that contain new media should be scanned for viruses before connecting to the players to download the content. Additionally, the players should be cleaned as often as the screens to prevent build-up of dust and should also be opened up from time to time to clean out internal components. Memory is limited on the devices, so old content should be removed as needed or a memory card with increased capacity may need to be installed.
Average Lifespan of Equipment

What is the average lifespan of a digital sign?

A digital sign generally lasts about six to eight years with degradation.¹ This is assuming almost continual use of an LCD display, as these screens tend to work for about 60,000 hours.² Assuming that your screens are shut off during non-business hours and that you keep up on maintenance, updates, and minor repairs, the screens can last beyond the 6-8 year average. It is important to understand that the lifespan of screens is based on the quality of the image, rather than actual functionality. The screens will likely continue to power on for far beyond the average maximum of eight years as long as the bulb is not burnt out and the equipment is undamaged; however, the brightness and quality of the image will degrade enough within the average lifespan to warrant a new sign that offers clear visibility for customers and employees.

Other types of displays will have similar lifespans, but vary slightly. Plasma screens are subject to image burn, but do not need a bulb as they do not require a backlight. These displays used to only last around 40,000 hours, making them less desirable for longevity than their LCD/LED counterparts, but advances in technology have led to lifespans of anywhere from 60,000 to 100,000 hours before the images become unclear or dark.³ Assuming normal use of about 8-10 hours per day, these screens can last upwards of 20 years, though most businesses will discard the sign before then. The advancement of technology and/or the need to actively use signs for more than 10 hours daily will cause many businesses to implement early disposal of the technology.

What is the average lifespan of media players?

Media players will last for extended periods of time, but will usually need to be replaced based on functionality as the technology advances and the needs of your business change. The hardware will still work in the absence of mechanical failure or physical damage from employees or patrons, but faster processing speeds, increased reliability, improved content quality, and incompatibility with new software for dynamic, interactive content will require new equipment.

For many digital signage systems, screens are now equipped with internal media players, so external devices will not need to be replaced at all if these screens are installed. The media players imbedded in the screens will often last as long as the signage, but if the player is removable, you may want to swap out the device.

¹ http://www.digitalsignageconnection.com/10-key-menu-board-questions-answered
² http://lcdtvbuyingguide.com/lcdtv/lcdtv-misconceptions.shtml
³ http://www.selfgrowth.com/articles/the-lifespan-of-a-plasma-tv
from time to time with an updated version based on your content needs and the availability of more advanced technology.

**Software Updates**

Digital signage software for media players and content creation will require updates on a case-by-case scenario. Switching to interactive content and/or changing from static to active content will require new software or at least additional applications to display the desired elements. It may be beneficial to update content creation software to allow more creative, visually appealing, and high quality materials to put on display. It is also likely that newer software will become available that will enhance the quality and dependability of your signage and should be evaluated at least once a year.

More frequent updates and continual maintenance of systems can reduce the need for large-scale upgrades of major software components.

Large-scale upgrades can:

- Be extremely costly
- Require time-consuming testing
- Lead to additional staff training
- Result in a significant amount of time installing and deploying the software

**How often should updates be run?**

A general guideline is to run internet-based or cloud-based updates on a daily basis, with manual updates completed as is necessary for your particular software. More frequent updates may need to be manually run if the displayed content is in need of change. This depends on the frequency in which your operating system requires such updates. Monitor this on a consistent basis and set up your system to alert you of any new and/or urgent updates.

**When should I upgrade my software?**

There is no standard timeframe as to how long a system should run on a specific software platform, but with the rapid rate at which technology advances, it is good practice to evaluate your current systems on an annual, if not semi-annual basis. The most common reason a revamp of software would become necessary is if the current application no longer meets the needs of an organization or the security has been compromised and/or lacks optimal effectiveness.

**Most Common Problems**

*What are typical issues that arise with digital signage and how can they be resolved?*

- Limited bandwidth
  - Interrupted network connections from signage to a wireless media player
  - Unable to wirelessly update content
  - Failed synchronization to back-of-house server and/or media player

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- Outdated or malfunctioning equipment
- Compromised or out-of-date software
- Central server memory and/or hard drive failure

Network connection errors can be caused by a plethora of problems and diagnosing these issues can be complex and tedious. See Worldlink’s Manual on Maintenance and Repair for Network Infrastructure to learn what to do if connection issues arise.

Outdated or malfunctioning equipment can cause poor image quality, errors in streaming of dynamic content, and/or failed interactive capabilities.

Before discarding malfunctioning hardware:
1. Check to make sure that all wires are undamaged and connected properly.
2. Scan media player for viruses and run any necessary updates of software.
3. Ensure LCD bulbs are not burnt out and that there is no damage to the screen.
4. Check to ensure that there is enough space on your media player’s memory card/hard drive to load more content.
5. If all connections are in order, your digital signs are functioning, and media players are working properly, but the problem is not resolved, reboot your system.
6. If this does not resolve the problem and there is no visible physical damage an IT professional can test your systems. They can utilize an external computer to review the system’s operating data and/or access the internal components of media players or digital signage to see if a component such as a memory card, circuit board, or bulb is the culprit. If nothing seems to be out of the ordinary, but your equipment is still not working properly and the technology is relatively old, it is likely that the hardware has reached its end of life and more up-to-date technology is needed.

If a media player is malfunctioning or connected improperly, the display(s) will be unable to show your desired image or video.
If the display and/or media player are not working properly, attempt the following:
- Power off/unplug the devices, wait 10 seconds, and reboot the media player and screen
- Check all cables/connections to the digital display and player
- Try connecting another screen to the media player to see if the problem is a result of the media player or the digital display

If you are alerted of an issue with the memory, you may need to clear space by removing unnecessary files or transferring older, but valuable, data to an external hard drive or cloud storage system. Hard drives may also become corrupt or overtaxed and need to be scanned, wiped, and/or replaced.

Continual monitoring and maintenance of all hardware can mitigate the majority of the above-mentioned risks and prevent time-consuming and often costly restructuring and/or overhauls of digital signage systems.
Security Dilemmas

The risk of a security breach is minimal for signage with internal media players or external players that are hard-wired. However, there is a risk of hackers intercepting wireless transmissions from main servers to media players, giving them a back-door route to get into your sensitive business data if it is stored on the same server as your signage content. A more relevant issue is securing any wireless connection your digital signage may have to a patron’s mobile devices in which a hacker could intercept the transmission and gain access to a customer’s personal device. These attacks can provide access to customers’ personal data and lead to potential lawsuits and a PR nightmare that could lead to a dip in your consumer base and lost sales.

To mitigate the risk of these threats it is important to run scans on all network-connected media players/signage on a regular basis and educate your employees on the proper procedures of turning systems on and correctly shutting down systems as needed. All access to the media content (i.e. advertisements, videos, interactive games or way-finding, etc.) should be password protected and only key players should have access to the digital signage content. If content is shared wirelessly to your signage, the files should also be stored on a separate server than customer payment information, confidential information regarding employees, and/or other company data that is not meant for public eyes to prevent back-door access from live streaming to signage.

Tips for Preventative Maintenance:
- Change passwords for media content once a month
- Make sure anti-virus software is up-to-date
- Run full system scans weekly to determine errors in software and/or potential viruses
- Turn off screens and media players when not in use to prolong life of equipment/bulbs
- Backup new files on a daily basis and run a complete backup weekly
- Protect every wireless connection with passwords

Average Cost of Service

The cost of service, repairs, and installation of new screens or media players can vary quite a bit. Fees per contractor usually run about $65 to $85 per hour, and since most hardware replacements will take about an hour, the cost per replacement per contractor will be around $75 on average. This cost excludes travel and related expenses though, which will usually be factored into the first hour of service. Of course, higher fees will be accrued with additional screens and/or media players as well as multiple contractors.

As for cost of equipment, this amount can vary quite a bit based on hardware specs, the brand being purchased, how many screens are needed, and the number/type of media players associated with each. The average costs of hardware for different components of a digital signage system are seen in the table below.

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Average Cost</th>
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<tbody>
<tr>
<td>Commercial-grade Displays</td>
<td>&lt;$500 - $6000+</td>
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</tbody>
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5 http://www.higheredtechdecisions.com/article/understanding_the_costs_of_digital_signage/P3
### Average Time Needed

Basic cleaning requires wiping down screens and using compressed air to remove dust and debris that may build up around ports or crevices on your screen or media player. This is not a very time-consuming task and will take roughly 30 minutes per screen/media player if done thoroughly. However, cleaning out the internal components of media players and digital signs will require more time as the hardware will need to be powered off, partially disassembled, put together again, and then tested to ensure that the system was properly reassembled and in working order. Usually, one technician can handle taking apart, cleaning, and reassembling a digital screen and corresponding media player in 1-2 hours. This timeframe may be extended if issues arise when the system is powered back on or if a mechanical error is observed when the casing is opened up.

Checking for loose or frayed cables that connect the screen to external media players is a relatively quick task consisting of a few minutes per screen. This means your business is not likely to be disrupted or impacted unless a cable needs to be replaced. This can disrupt use of the signage for several days if spare cable is unavailable, requiring a purchase and delivery of new equipment.

Replacing components of existing digital signage and their media players (externally connected or internally housed), adding more screens in a store, or replacing old systems can take hours or days depending on the scope of the project.

- Installing new screens and connecting them to media players will likely take about an hour. This gives technicians times to mount the screen, power up the device, connect to a media player (if applicable), configure the screen to work properly with the media player and content software, and test the system.
- Installing new digital signage can take several hours depending on how many screens need to be mounted and installed. One new screen may take less than an hour, but multiple installs of screens and their synchronization with media players will likely be more time consuming because configuration and testing will be a lengthy process.
- Replacing old screens/media players will take about 2 hours per screen/player as the old system needs to be powered off, disconnected, removed from wall mounts (if applicable), and properly packaged for storage or disposal before the general hour-long task of installing new screens or media players (as mentioned in the previous bulleted section).

### Cleaning and Repairs

Equipment should be regularly wiped down and/or air-dusted to ensure unwanted debris does not interfere with the copper...
connections and other sensitive equipment as well as ensure a clear, uniform view of the content displayed. From time to time it is necessary to do a more thorough cleaning, which may require unplugging cables and/or dismantling the media player as well as ensuring the equipment is reassembled properly and all connections to the network are reinstated accurately. This may require hiring an outside resource if an internal IT team is not available or trained on digital signage hardware and network connectivity. The amount of time it takes to wipe down screens and blow out any micro-debris will depend on how many systems are in need of cleaning and the size of the screens that are being wiped down. Generally, a basic cleaning of all systems by employees will take less than an hour, but a building with numerous displays will likely require a bit more time, manpower, and/or expertise, especially if any media players or screens need to be taken apart for cleaning. This time can also drastically increase if problems occur while reassembling screens and/or media players, which may require troubleshooting and possible repair.

Repairs should be done as soon as an issue arises and can vary based on the equipment that needs to be replaced. The timeframe is also dependent on whether it is just a component of the system that needs replacement (often requires less time) or if a full swap-out is required.

There are some scenarios in which immediate repairs are crucial in preventing complete system failure. Buildup of dust and overheated systems are the main culprits in forcing early retirement of your digital signage screens and/or media players. If a fan or cooling system fails, dust can build up and your equipment can overheat which can cause shortages and fire hazards. If you notice your cooling system is not functioning properly, shut down the system immediately and keep the signage turned off until the hardware is repaired or replaced. Another component that needs immediate repair/replacement is LCD bulbs that are dimming or have burnt out. With a dimming bulb, your image will be extremely dull and it is likely that the bulb will burn out in the near future which will render your screen useless until replaced.

**Conclusion**

Digital signage can be an effective tool in providing information, advertising products or services, and providing unique experience for patrons, as well as more informed and effective employees. Maintaining the hardware and software associated with the signage will help to prolong your systems, helping you get the most out of your investment. In order to display quality images, whether they are static, dynamic, or interactive, depends on your team’s diligence in cleaning the hardware, attending to minor repairs as soon as possible, and updating the technology when your current system no longer meets the needs of your business. With or without an internal IT team, businesses may benefit from utilizing a trusted partner for consultation, product procurement, and service of equipment as they can deploy contractors who specialize in digital signage technology, freeing your staff to tend to other facets of your daily operations.

*Note: The tips provided in this document are based on information previously published. It is advised that you refer to security providers and hardware manufactures prior to taking any action.

For more information on Digital Signage installation and modern uses, visit our [original content page](#) or check out our [Twitter](#) page or [Scoop.it](#) feed.