

Forward-thinking Solution Providers Gain an Edge in Digital Signage

Intel® technologies increase the value proposition of signage by simplifying system deployment, management and performance measurement



Figure 1. Coca Cola* Wireless Digital Signage with Intel® AMT for Convenience Stores

Digital signage is taking off in a big way, which is motivating many solution providers to look for ways to differentiate themselves in an increasingly competitive market environment. Digital signage is a cross-industry phenomenon, with retail, corporate, transportation, healthcare and hospitality as top market segments, and each has rather unique communications and business objectives. This diversity presents opportunities for system integrators, content management software (CMS) vendors and other solution providers who are able to satisfy particular end-user requirements by offering cutting-edge capabilities.

Digital signage usage continues to grow because its leading segments are demonstrating a proven ability to attract and reach large audiences with diverse demographics. The industry had been increasing at about a 40 percent CAGR, though most analysts are now forecasting a 35 percent CAGR for the next few years. Utilizing 2010 actual shipments and a conservative CAGR of 26 percent, Intel's model for the digital signage market predicts growth of 10 million media players and a corresponding 22 million digital signs by 2015.

Solution providers looking to profit from this expanding market can increase the value proposition of digital signage by incorporating a number of Intel-developed technologies:

- Robust remote management with Intel® Active Management Technology (Intel® AMT)¹
- Audience metrics and targeted advertisements with Intel® Audience Impression Metrics Suite (Intel® AIM Suite)
- Easier equipment deployment with the Open Pluggable Specification (OPS)

This paper discusses how solution providers can deploy these technologies and the resulting benefits for them and their customers.



“With Intel® AMT, we can securely control all the media players from a central office using a combination of wired and wireless technologies.”

*Carlos Alonso Nuñez
Director of Strategy, Projects and Online Technologies
Transports Metropolitans de Barcelona**

Complex Undertaking

Deploying digital signage solutions can overwhelm end users who try to do it all themselves because expertise is needed in a number of areas, including content production, IT, audiovisual, software, installation and display technologies. This is where solution providers fit in – they guide end users through the process, often customizing solution components, in order to cost-effectively meet the project’s key objectives.

In digital signage, solution provider is a catch-all term for the various vendors who contribute to the end product. Some vendors deliver hard assets, such as displays, media players, mounts and network connections; others provide soft assets, like media content, application software, device management and systems integration. This is not a complete list, and some vendors wear multiple hats.

Solution Provider Benefits

What’s common among digital signage vendors is their desire to differentiate themselves, increase revenue, deploy solutions faster and establish a recurring revenue stream, if possible, by performing on-going services. Intel can help on all these fronts by supplying leading-edge technologies that enable solution providers to offer more innovative and cost-effective solutions, giving them an edge against their competitors. Here are some game-changing Intel® technologies for digital signage:

Intel® AMT

Greater Differentiation

- Power systems on/off, saving end users thousands of dollars in energy costs
- Fix more software issues, reducing the number of expensive truck rolls

Increase Revenue/ROI

- Integrate capabilities into the CMS and create value-added bundle

Recurring Revenue

- Offer remote management services, producing monthly receivables

Intel® AIM Suite

Greater Differentiation

- Measure viewing time of people looking at signage to gauge its effectiveness
- Enable content targeting by viewer demographics (e.g., age bracket and gender)

Increase Customer ROI

- Enable customers to make data-driven decisions based on objective audience measurement data to maximize return on investment (ROI).

Recurring Revenue

- Provide a subscription-based Software-as-a-Service (SaaS) platform that generates a recurring revenue stream.

OPS Specification

Standardization of Display Integrated Players

- Simplify deployments with highly interoperable displays and media players
- Eliminate unsightly wires, and employ very compact, secured media players

Faster Deployment

- Deploy solutions faster since device compatibility is built-in (i.e., Plug & Play)
- Upgrade systems more easily because of standard interfaces

The following sections briefly describe these technologies and explain how solution providers can incorporate them into their digital signage offerings.

Advanced Remote Management with Intel® AMT

The ability to remotely manage digital signage has evolved, and as most of CMS products primarily focus on managing the content, such as distribution and scheduling play times, the ability to remotely manage hardware and the operating system has become a fundamental requirement. This is possible with Intel AMT – available on Intel® vPro™ technology-based platforms – which provides the ability to remotely perform hardware-level diagnostics, make BIOS and repair operating system or application faults, thus helping to maximize the uptime of digital signage systems.

Intel AMT represents a significant remote management breakthrough because it implements a unique capability (i.e., circuit) in the Intel® chipset that can access and control the media player even when key software components aren't functioning properly. This circuit establishes an independent out-of-band link that allows the management console to communicate with the media player as long as it's plugged into an electric outlet and the LAN. Intel AMT decreases IT support costs by enabling more problems to be fixed over the wire, thus reducing the number of onsite visits traditionally required to diagnose and fix problems. For more information, read the case study at edc.intel.com/Link.aspx?id=4215&wapkw=323427.

INTEL® AMT IN ACTION

Every day in Barcelona, millions of people take public transportation, riding the subway, buses, cable cars and funiculars. Recently, the city's main public transport operator, Transports Metropolitans de Barcelona (TMB), completed an ambitious project that greatly improved the information available to passengers while waiting on platforms, and during their journey by bus and metro. For instance, passengers at a subway stop can see the arrival time of the next train, watch news of general interest and read notices related to service delivery, on a high-resolution digital signage display, as shown in Figure 3.



Figure 3. Digital Signage Display in a Subway Station



Figure 2. Digital Signage Display with Intel® AMT on a Bus

An integral part of the content management system is Intel® AMT, which enables TMB personnel to quickly fix many types of system problems remotely, thus improving system availability and the passenger experience. In addition, Intel AMT allows TMB to manage systems when they are turned off or when the operating system is unresponsive, because it makes use of the manageability capabilities built into Intel® silicon components. The technology works over LAN, Wi-Fi and 3G, and is supported by the Intel® Core™ vPro™ processor-based media players. Communications are encrypted, which helps protect the content from being compromised by hackers.

Total Cost of Ownership (TCO) Example

To illustrate the savings potential of Intel AMT, 5th Screen Digital Services*, a consulting firm for digital engagement, provided cost data from a recent installation. The savings fall into three categories, as detailed in the following:

- Lower utility cost: Using Intel AMT, the client can reliably power systems on/off, doing so at 10am and 10pm, respectively. During off hours, the power savings is about 450 watts (~180W for the media player and ~255W for the 55 inch display). This translates into a utility savings of approximately \$228 per year per system, based on 12 off hours per day and \$0.12/KWHR (USD).
- Lower system management cost: The client's internal IT organization charged \$70 per month for managing each digital signage system; and since it was already stretched, IT preferred to have it done by an outside organization. The ability to more efficiently monitor and repair systems remotely with Intel AMT enables 5th Screen Digital Services to perform the service for around \$50 per month, or a \$240 savings per year per system.
- Reduced field maintenance cost: The service rate for a typical PC platform running 24 hours is about 15 percent after the first year, assuming a non-Intel AMT-based system that is always on. Figuring a truckroll charge of \$350, even if all that's needed is a system reboot, the average annual savings is about \$52 (after the one year warranty period).

According to this analysis, Intel AMT can save its client about \$520 per system per annum. "An Intel® AMT-enabled media player can pay for itself in less than six months and continue to reduce TCO for years to come," says John Curran, President and COO at 5th Screen Digital Services.

Ready-to-Deploy Tools

Intel AMT-enabled media players are typically accessed via a management console that is supported by either CSM vendors or system integrators. Consoles can take advantage of more than twenty available Intel AMT Help Desk tools, including:

- Green Power Management – save energy by powering systems on/off automatically
- Easy Reimage – reimage a media player from a "golden" disk drive on the network

- Drive Mounting – mount a drive as if it were physically inside the media player
- Drive Erase – erase a drive remotely
- Microsoft* Windows* Preinstallation Environment (PE) – repair Windows registry and fix more problems remotely
- Windows Recovery Environment – fix a media player that won't boot

Integration Options

Solution providers can incorporate Intel AMT functionality in a number of ways, all of which support a different management console implementation approach.

>> Option 1: License

For vendors who do not currently offer a management console, they can license one of over two dozen consoles available from industry-leading software companies, which are listed at [\(click\)](#).

>> Option 2: Customize

It's possible to create a console by using the free Intel® Manageability Reference Console (non-disclosure agreement (NDA) required) that supports a dashboard supporting six critical tools based on the capabilities of Intel AMT. Developers get access to source code and the high-level APIs used to make calls to the Intel AMT engine. To download the software, [\(click\)](#).

>> Option 3: Extend

A vendor, who is using a pre-existing console or building one, can incorporate Intel AMT-based tools while maintaining their preferred look-and-feel. The Intel® AMT Software Development Kit ([click](#)) provides the high-level APIs, reference code, executable binaries and a keyboard-video-mouse (KVM) viewer. There are two versions of API documentation available ([non-NDA](#), [NDA](#)).

>> Option 4: Script

It's possible to write scripts to automate tasks or take advantage of native Microsoft Windows PowerShell, a command-line shell and scripting language built on the .NET Framework and designed for system administration and automation. For more information, [\(click\)](#).

Note: See footnotes 2-5 for the full URL links.

“We made Intel® AIM Suite part of our strategy to collect metrics about audience engagement, as well as mine consumer data from viewing patterns and help our shoppers navigate through what can be a busy environment.”

*Aileen White
Manager of Retail Environment and Consulting Services
Deeley Harley-Davidson* Canada*

Anonymous Viewer Analytics with Intel® AIM Suite

What you can measure, you can improve and optimize. Intel AIM Suite technology is used with digital signage to gauge the effectiveness of media content by measuring how much time people spend looking at displays. Moreover, the technology provides anonymous audience demographic data (e.g., age bracket and gender). Combining viewing time and demographics information allows brands and retailers to tailor advertising content based on audience behavior and characteristics, helping to show the right message to the right people at the right time. Intel AIM Suite makes it possible for advertisers to maximize the return on investment (ROI) and return on objectives (ROO) for their digital signage campaigns.

Performance Measurement

The underlying technology for Intel AIM Suite is called Anonymous Viewer Analytics (AVA), which utilizes Intel® processors and small optical sensors embedded in the digital sign. AVA utilizes face detection algorithms to aggregate data on how many people looked at the advertising, how long they watched and their demographics, as depicted in Figure 4. It does all of this while maintaining total anonymity and complete respect for people’s privacy as outlined in the 7 Foundational Principles of Privacy by Design.⁶



Figure 4. Example of Customer Demographic Information Gathered with Anonymous Viewer Analytics

Seamless Integration

Digital signage applications communicate with Intel AIM Suite via the Intel AIM Suite Socket and Web APIs, which allows easy access to several functions.

- Gather real-time information about the current audience
 - Allow the digital sign to play targeted advertisements
- Collect content-specific metrics
 - Understand viewership counts and demographics for each piece of content
- Retrieve audience viewing time and demographics from Cloud-based Intel AIM Suite servers
 - Import viewership proof-of-impression data into any database

The API documentation required to complete integration must be obtained through an Intel representative.

Speaking about the effort to integrate Intel AIM Suite with their Content Management System (CMS) platform, Daniel Parisien, vice president of marketing and strategy at BroadSign International* LLC, a provider of software solutions for managing digital signage networks said, “Integration was simple and straightforward.” The BroadSign* Digital Signage Software platform and Intel AIM Suite provide advertisers proof-of-play reports as well as audience viewing measurements for every instance an ad plays. The combination of these services is valuable to advertisers, who otherwise have to rely on self-reported audience data or bear the expense and time of personally counting and interviewing people in the sign’s vicinity.

Recurring Revenue Stream

BroadSign's automation platform and digital signage applications are hosted in the Cloud using a Software as a Service (SaaS) model. The platform supports standard media workflows, such as CMS and reporting, and allows clients to access all the applications through an intuitive interface. Subscribers to BroadSign Managed Services can quickly deploy a network of any complexity without the usual learning curve, thus focusing on strategy implementation and revenue-generating aspects of their business right away.

The process starts with clients who are interested in both buying advertising time and getting audience information. This

leads to a contract for an advertising campaign comprising ad buys and ad space reservation. The campaign is programmed using rules, which enables the system to run the campaign - playback and delivery monitoring - without human intervention. Intel AIM Suite, which is integrated into the platform, monitors content playback and audience make-up, so that reports correlating proof of display with audience data are automatically generated. The client can use the data to invoice advertisers based on the performance of the campaign, such as charging more or less depending on the audience volume and interest level the sign was able to deliver. BroadSign charges a monthly fee for their services.

ANONYMOUS VIEWER ANALYTICS IN ACTION

In 2010, Deeley Harley-Davidson* Canada decided to develop and test custom-designed digital signage kiosks on the Canadian motorcycle show circuit - magnet events for Harley lovers. The signs have a small sensor embedded on the front that is connected to a computer running Intel® Audience Impression Metrics Suite (Intel® AIM Suite). Using Intel's pattern detection algorithms, Intel AIM Suite software measures and aggregates data, in real-time, providing objective analysis of:

- How many people saw the screens?
- Which viewer segments looked at and engaged with the screens?
- What content were they watching and for how long?

This data helps Deeley Harley-Davidson Canada understand viewer engagement patterns, which will allow them to optimize their content and determine which motorcycles have the greatest appeal. The aggregated data is processed, uploaded to Intel's cloud servers on a near real-time basis, and then output in a flexible, browser-based format that gives users a visually rich understanding of what's happening at and around the displays. Intel AIM Suite data is easily integrated with data from other sources, enriching the value of the information even further.



Figure 5. Motorcycle Show

The digital signage system was developed by Planet-Tek* systems, a systems integrator who assisted with content creation, touch screen interfaces, application development, installation and other things. Planet-Tek incorporated the BroadSign* digital signage automation platform with Intel AIM Suite, which allows Deeley Harley-Davidson to pull reports based on the viewer analytics data. "The top priority for our clients is to know who their audience is and how long the messages are being viewed. Animated digital will hold audience attention longer than static displays, and Intel AIM Suite proves this out. On a regular basis, we do a deep dive on the viewer analytics data with our clients in order to gain insights that help tune their campaigns. We look carefully at the traffic by audience mix, time of day and location, to make sure our client is targeting the right audience," says George Andreoglou, President of Planet-Tek Systems.

Improved interoperability and compatibility with OPS

Intel developed the OPS to simplify the device installation, usage, maintenance and upgrade of digital signage infrastructure. This open standard defines electrical, mechanical and thermal specifications for connecting together media player boards and display boards via an 80-pin JAE connector that supports commonly used interfaces such as DisplayPort* and USB, among others, as shown in Figure 6. The overall objective is to enable digital signage manufacturers to deploy interchangeable systems faster and in higher volumes, while lowering the costs for deployment and implementation.

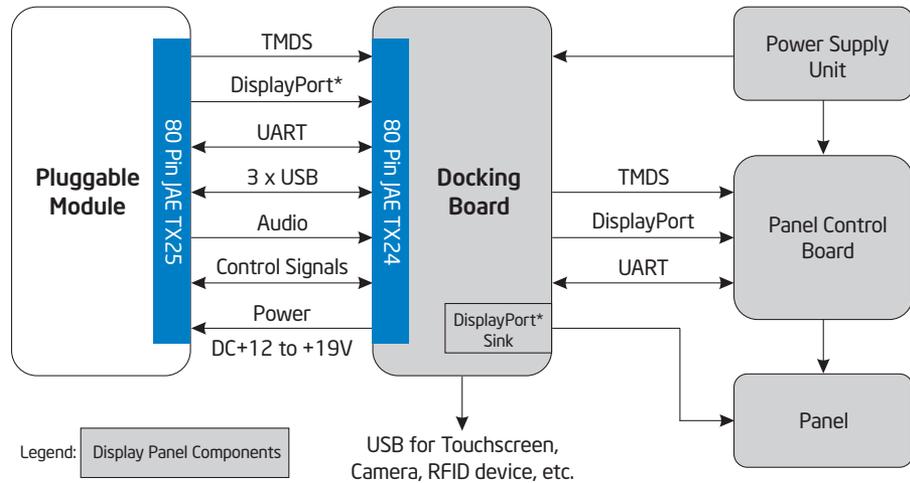


Figure 6. OPS Standard Components: Pluggable Module and Docking Board

OPS IN ACTION

Rise Display* helps its clients create unique content and select the displays that best fit the target environment. Rise Display provides complete and customized digital signage solutions consisting of displays, web-based content management and supporting services, among other offerings. Today, the company focuses specifically on LED tickers, university finance labs, campus communications (Figure 7) and 'Giving Recognition' displays. Rise Display delivers a comprehensive solution combining their software applications pre-integrated on media players, along with other essentials such as wall mounts and network connectivity. About 90 percent of their systems are OPS-compliant and based on media players equipped with Intel® processors.

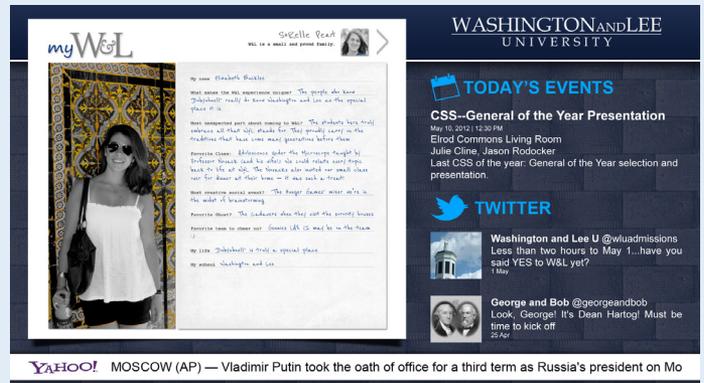


Figure 7. College Communications Display

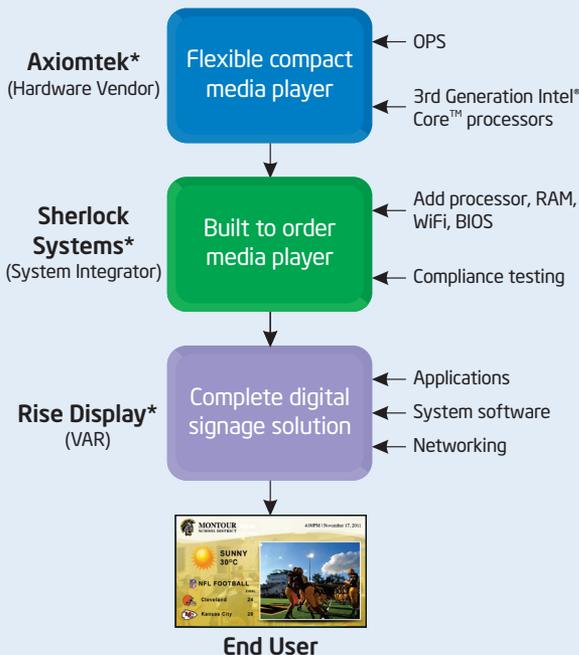


Figure 8. Supply Chained Based on OPS-Compliant Digital Signage Solution

Value Chain

Since the deployment of digital signage involves various technologies, skillsets, application software and integration into existing networking infrastructure, the supply chain tends to be horizontally integrated. For instance, the solutions previously mentioned are supported by several vendors, as shown in Figure 8. The OPS-compliant media player supports Intel® AMT and is manufactured by Axiomtek* using Intel® Core™ processors. The media players are configured to order by Sherlock Systems*, who adds components, configures the BIOS, preloads the operating system and performs other services, as needed. Rise Display delivers a complete solution to the end customer, which may entail developing specialty application software, integrating the media player and display, and adding the other essential parts, such as wall mounts.

“The OPS standard makes digital signage installations clean and simple - no wire clutter, and Plug and Play components.”

*Ryan Cahoy
Managing Director
Rise Display*, Inc.*

Faster Deployment

The OPS specification benefits both digital signage system manufacturers and users. When manufacturers employ the OPS specification, their products will be compatible with more systems – installed and future – allowing systems to be deployed faster. Moreover, upgrading infrastructure is simpler because components are interchangeable by design. This approach helps to future-proof technology investments by promoting greater interoperability.

OPS-compliant systems are modular in nature, which provides significant operational benefits. For instance, a media player with a hardware fault can be repaired quickly by simply replacing the entire pluggable module. This is a significant advantage over built-in solutions, which require the replacement of the entire display unit in case of a PC failure.

Simplifying Digital Signage Development and Deployment

Rapid growth in the digital signage market has resulted in a highly fragmented industry, which has negatively impacted compatibility and interoperability between current and

evolving components. OPS is helping to overcome these challenges by enabling digital signage manufacturers to deploy interchangeable systems faster and in higher volumes, while lowering costs for development and implementation. It is expected that standardization through OPS will further accelerate growth and innovation in digital signage and at the same time, reduce overall cost, creating new opportunities for the various vendors serving this exciting market segment.

Increasing the Digital Signage Value Proposition

The impressive growth of digital signage across a wide range of industries is attracting a lot of attention among solution providers. However, the industry is still in its infancy, and the adoption of new technologies will make it easier to deploy and manage signs, and even measure their performance, further increasing the value proposition. Forward-thinking solution providers can lead in these areas by incorporating Intel technologies, such as Intel AMT, Intel AIM Suite and the OPS specification, thereby creating differentiation in a highly competitive market.

For more information regarding Intel® technology in digital signage please visit: www.intel.com/retail

¹ Intel® Active Management Technology (Intel® AMT) requires the platform to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. With regards to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see <http://www.intel.com/technology/manage/amt>.

² Option 1: License <http://www.intel.com/content/www/us/en/processors/vpro/vpro-software-catalog-find-your-solution-stack-catalog.html>

³ Option 2: Customize <http://edc.intel.com/Link.aspx?id=4934>

⁴ Option 3: Extend <http://software.intel.com/en-us/articles/download-the-latest-intel-amt-software-development-kit-sdk/?wapkw=Intel%20AMT%20SDK>, <https://login-software.intel.com/isn/Login/LoginLite.aspx?Lang=ENG&TARGET=http://software.intel.com/en-us/articles/intel-amt-high-level-api-intel-manageability-library-to-manageability-webpage/>, <http://isdc2.ill.intel.com/TFSPublish/>

⁵ Option 4: Script <http://www.intel.com/go/powershell>

⁶ Sources: <http://www.ipc.on.ca/images/Resources/7foundationalprinciples.pdf>, <http://www.privacybydesign.ca>

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