The Next Unit of Computing in Digital Signage Applications

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Intel Desktop Boards
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Introduction to Digital Signage
Digital Signage is a form of electronic display that shows information, advertising and other messages. Digital signs (such as LCD, LED, plasma displays, or projected images) can be found in public and private environments, such as retail stores and corporate buildings.

Digital Signage is used for many different purposes. Below are some of the most common Digital Signage applications:

Public information -
News, weather and local (location specific) information, such as fire exits and traveler information

Internal information -
Corporate messages, health & safety and news.

Advertising -
Either related to the location the signage is in or just using the audience reach of the screens for general advertising.

Brand building -
In-store digital signage to promote the brand and build a brand identity.

Influencing customer behavior -
Directing customers to different areas, increasing the dwell time on the store premises.

Enhancing customer experience -
Applications include the reduction of perceived wait time in restaurant waiting areas, bank queues, etc., as well as recipe demonstrations in food stores.

Enhancing the environment -
With interactive screens (in the floor for example) or with dynamic wayfinding.
Based on the market survey above, the Digital Signage market is expected to grow at a CAGR of 26% over the next few years. The retail market will be the main growth driver with North America projected to have the biggest market size.
5.1. Market Segments

Table 1 below shows the high-level features that are required on a digital signage system. Graphic and processor intensive applications will require an Intel® Core™ i7 processor. An Intel® Atom™ processor-based system will be adequate for a basic digital signage application.

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Table 1: A comparison of digital signage platform featureset

5.2. Intel® Audience Impression Metric (AIM Suite)

What you can measure, you can improve and optimize. Using Intel® AIM Suite technology, digital signage networks can now be used to gauge the effectiveness of their content by measuring how much time people spend looking at displays and determining the effectiveness of advertisements at capturing the attention of an audience. This 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.

The underlying technology for Intel® AIM Suite is called Anonymous Video Analytics (AVA), which utilizes Intel® Processors and small optical devices connected to a digital signage system. Intel® AIM Suite software utilizes anonymous face-detection algorithms to aggregate data on how many people looked at the advertising, how long they watched, and their demographics (e.g. gender and age bracket). It does all of this while maintaining total anonymity and complete respect for people's privacy.

This targeted advertising approach is enabled by powerful Intel® Core™ i5 and Intel® Core™ i7 processors, which can run the advanced AVA application while simultaneously playing high-definition video content on the same computer system.
• Intel® AIM Suite – The master control application for the AVA solution. It manages instances of Intel® AIM View and uploads data to Intel® AIM Analytics

• Intel® AIM View – Intel® AIM Suite’s face-detection technology module. The software analyzes a video stream from an optical device and detects faces of people viewing the digital signage display, providing information on the number of viewers and their demographics, viewed content and dwell time

• Intel® AIM Analytics – Web-based reporting system. This cloud-based service provides advertisers and digital signage networks with a secure means to view their data, generate reports and enable automated e-mail reports.

• Intel® AIM Manage – Web-based license and sensor management system. This cloud-based system remotely manages all computers running Intel® AIM Suite.
2. The Next Unit of Computing

The Next Unit of Computing (NUC) is the smallest complete unit of computing powered by an Intel® 3rd Generation Core™ i3-3217U processor and an Intel® QS77 Express chipset for responsive performance and energy efficiency at the same time.

The Intel® Desktop Board DC3217IYE NUC unit is truly a computing revolution at a size of just 4.6” x 4.4” x 1.55”. It offers dual HDMI display outputs, 3 external USB2.0 ports for expandability and an Intel® 82579V 10/100/1000 LAN Ethernet. It also has dual SO-DIMM memory slots supporting up to 16GB of DDR3-1600 memory and dual PCI Express Mini Card connectors (1 full length and 1 half length) with USB 2.0 routed. The unit is powered through a backpanel DC-jack which supports 12V-19V DC power supplies at 65W. A Kensington lock power is provided for additional security.
The DC3217YE comes with a standard VESA mounting bracket for mounting behind VESA-compatible displays. A motherboard-only Intel Desktop Boards D33217GKE sku is also offered. An internal USB 2.0 header supporting up to 2 USB ports, internal DC power connector and standard Intel Desktop Boards front panel header is offered to ease integration and expand its capabilities.

Both skus are offered with 3-year availability from Intel®. Please contact your Intel® representative for product code and ordering information.
3. Digital Signage Software

3.1. Ryarc® Campaign Manager™6.0

Ryarc Campaign Manager™ is a digital signage single platform software solution that centrally manages, controls and distributes content to:

- Public screens, projectors, LED, etc.
- Audio (audio channel / retail radio)
- Corporate communication – screen saver player for desktops and laptops
- Interactive screens and kiosks

Campaign Manager allows publishing of content which can be common, or unique among any number of display devices.

**Multi Zone Screen Layout**

The Screen Designer allows a user to create and manage unlimited screen “Zones” on a screen.

All standard graphic formats - Movies, Flash*, Live TV, Web Pages, Images, Streaming, Interactive Content, HD Content, etc.

Each zone can contain its own individual playlist.

Screens can be defined as per Landscape or Portrait, and as per different aspect ratios - 4:3, 16:9, etc.

![Figure 8: Campaign Manager – User Interface](image)

Screens can be defined and designed as per Landscape or Portrait and as per different aspect ratios - 4:3, 16:9, 16:10, etc.

The Screen can also be designed using Pixels for specifying target screen resolution.

Pop-up zones can be used to play media items in a zone which appears and disappears based on specific intervals. Any zone can be configured to be a pop-up zone.
Supported Media Format

Scheduling Feature
Campaign Manager* has a powerful scheduling feature that allows users to schedule the content as required.
Each media items can have their own activation and expiration dates or they can follow the Campaign activation and expiry dates as per Campaign Scheduling created by the users.

Multi-Instance Support
If two or more computer screens are connected to different video outputs on one digital signage system, a separate content can run on each of the screens.

Stretch Content Across Screen
Digital Signage players can also be configured to stretch across multiple screens.

Unlimited Tickers
Users can publish any number of tickers they want which could be Static (what you type is what you see) or Dynamic (can take RSS feeds). Users can also selectively Show or Hide the ticker on the screen when a particular content is played.

Multiple Campaigns to the Same Screen
Campaign Manager* allows users to publish multiple campaigns to the same screen each having different screen design or content and allowing priority control.

Grouping and Categorization
Screens can be grouped and categorized. The content can be narrowcast and targeted to individual screens or as per grouping and categorization.
Individual audio volume and balance levels can be set from the Campaign Manager for individual media files.
Adjusting the balance can also be used to split the audio channels for Dappler and Campaign Manager Player to avoid audio overlapping when running both applications simultaneously.

Emergency Messaging/Localized Content Play on Trigger
Campaign Manager* has a trigger features that allows any emergency content to interrupt existing content being played on the screen and start playing the emergency content.

Remote Commands
Campaign Manager* allows users to issue remote commands such as custom serial commands (For TV control), restart player, get device information, etc.
**Network Agnostic**
Campaign Manager* works on any type of IP based network - LAN, Internet, VPN, VSAT, IPLC, GPRS etc. Campaign Manager supports unicast as well as multicast.

**Alerts to Administrator**
Digital Signage players can automatically send an email to the administrator in case of any problems.

**Security Protection**
Campaign Manager* has built-in security features including groups and user based security.

**Password Protection on Player Exit**
Password protection can be set and prompted when users attempt to close the player.

**Pooling Feature**
Campaign Manager* has a unique pooling feature that allows users to create pools of related files which are then used for randomized playback based on cyclic patterns. ‘Pool Patterns’ can be created to emulate structured playlists similar to those used in commercial radio and TV broadcasting.

**Intel® Active Management Technology Support**
Intel® Active Management Technology integration into Campaign Manager provides powerful tools that help customers manage remote assets, reduce downtime and reduce costs by avoiding site visits. This feature will be available if remote managing an Intel® vPro™ board (Example: Intel® Desktop Board DQ67EP).

**Intel® AIM Suite support**
Intel® AIM Suite integrated into Campaign Manager 3.0 as Conditional Play. It provides support for Anonymous Video Analytics which collects viewer data and enables specific content to be played according to viewer demographics (e.g. age group and gender) detected from a front-facing camera.

**Node Server**
Helps save bandwidth cost and requirement. Node server allows one player in a group to act as the master player which downloads all the heavy content files on behalf of other players which then pick up their content locally over LAN. This helps in saving bandwidth costs as well as time.

**Live TV and Camera Feeds**
Users can configure up to 52 different live TV channels or camera feeds per screen and control which part of the screen users want to show them or at what intervals users want to show them.

**Campaign Playback Reports**
Ryarc Campaign Manager* comes bundled with Neptune which provides proof of playback reports.
4. Hardware Configuration and Performance Benchmark

The Intel® Desktop Boards D33217IYE was configured into a typical digital signage media player with the following hardware:

- Intel® Desktop Boards D33217IYE
- 1x 2GB DDR3-1333 SO-DIMM
- Intel® 310 Series 80 GB mSATA SSD
- Intel® Centrino™ Advanced-N 6235 dual-band WiFi with Bluetooth 4.0
- Logitech® HD 615 Webcam

The following describes the software used for testing:

- Windows 7 Ultimate SP1
- Intel® AIM Suite v1.0.14.0
- Intel® AIM Demo v1.8.2.0
- Ryarc® Campaign Manager™ 6.0

4.1. Ryarc® Campaign Manager™ 6.0

The benchmark platform was able to run a variety of media files including AVI, MP4 and MOV video files. It was able to run up to 6 1080p videos on screen at the same time with a smooth frame rate and no noticeable lag. Intel® AIM Suite was also running in the background.