Smart Digital Signage Generates the Era of AloT: Smart Integrated Digital Signage — a Pioneer of Smart Display Modules

Technology advancement leads to improved applications

To meet the needs of today, advertising displays have evolved from traditional bulletin boards to backlit screens, these technologies have facilitated innovations and enhanced new displays, such as digital signage. Compared to conventional bulletin board or static backlit monitor, digital signage is capable of displaying on-demand multimedia content such as live video feeds and real-time surveillance images, etc. These technological improvements fulfill the need for a more rapid transmission of a diverse range of information in today’s commercial environment.

Litemax® adopts the Intel® SDM module to drive a new revolution in the smart IoT industry and meet the needs of the commercial sphere.

The Rise of Connectivity Between Applications

Growing smartphone reliance, wireless network coverage and interactive multimedia have created a demand for smart networking applications; thus, corporations are working to create new devices for the commercial environment that can enhance the user experience wirelessly. Establishing a link between people and things is an important goal for the future that can be achieved through acquiring cloud computing and terminal sensing feedback from the network. For example, cities are being developed into smart cities through the use of digital signage to develop unmanned stores, interactive advertising, and smart bus stops that communicate with end users. Digital signage is gradually re-defining the way networks of physical devices or the Internet of Things (IoT) can benefit customers in the commercial environment.

AloT, a Terminal Objective in IoT Development

As IoT continues to develop, industries are discovering unique ways to use technology. IoT applications are constantly diversifying and expanding. For example, in the retail industry, applications can strategically play back targeted advertisements based on a customer’s gender or age; in the transportation industry, they can calculate traffic, alternate routes, and time data to provide drivers with optimal itineraries; and in the health industry, wearable smart-products can provide physiological and behavioral data to users for personal health management. IoT devices collect data wirelessly through sensors and transmit information to a computer via Internet. This vast amount of data generated is extremely important and appropriately applying this data to digital signage is our goal in integration. Initially, IoT applications were short of intelligence, slow in development, and limited to single-network data collection. Now, through the integration of advanced artificial intelligence (AI) algorithms, today’s IoT devices can capture vast amounts of media data as a basis for learning, construct a layered network architecture, perform repeated system self-learning and correction tasks, and calculate the final analytics for predictive judgment as well as analysis through AI. Integrating AI with IoT in the future will achieve complementary results.

Advancement in mobile devices, computing, and broadband networks technologies means that the large amounts of data collected by IoT can be used to enable the continual expansion of the AI ecosystem, adding value to the collected data. At the same time, increase in computing power contributes to rapid breakthroughs in identification technology (ID Technology). In combination with IoT, ID technology can collect large amounts of information and data in real time. AI algorithms are now being introduced on top of IoT to create the Artificial Intelligence of Things (AloT); with limitless data available that can be tailored to the specific needs of individual industries.
Major Innovations in Digital Signage

Electronic displays have been a growing means of delivering public messages in the commercial environment ever since they were first developed. In the past, both functions and content were relatively basic, with a simple, closed system architecture equivalent to a closed-circuit television (CCTV) for content display. With AIoT integration, digital signage functions can be applied to various devices through the use of digital electronic sensors to detect changes in the state of the object or system. Display, identification, interaction and transmission technologies can be integrated to meet different requirements; AI can then filter through large amounts of data before responding and improving the systems performance to provide terminal and remote updates, maintenance and repairs. This technology will open up whole new concepts for smart business in the future. For instance, the expansion of face recognition, smart digital signage, smart shelves and other innovative services can be paired with emotional comprehending, social networking and navigation for a richer customer experience. The incorporation of AIoT smart software and hardware solutions into digital signage will continue to thrive. The added value gained through linking this platform to various smart applications means that digital signage will be a driver of innovative services in emerging consumption models and market development (Figure 1).

However, to achieve this smart software processing, digital signage hardware must overcome several problems:

1. Time-consuming performance updates.
2. Limited room for hardware expansion.
3. Lack of unified specifications.

To respond to the rapidly changing and diversifying commercial environment, digital signage suppliers must take appropriate action.

Applying the Intel® SDM Core Concept to Digital Signage

So far, precision digital signage systems play an important role in a variety of applications. From multi-functional digital signage navigation services to public multimedia kiosks that offer social interaction experiences, these systems can be combined with AIoT digital displays to create added value. As digital signage systems develop and become more compact, installation operations increasingly emphasize integration and power-saving, green energy designs. In response to these demands, the Intel® Smart Display Module (Intel® SDM) was developed as a long-lasting display solution. This module provides smart functionality and compatibility in a complete and compact package. The platform can easily be applied to slim integrated displays and it fully supports external plug-and-swap functions for future updating convenience.

The Best Choice for Commercial Digital Signage

Most past and existing commercial displays require add-ons to integrate computing systems and displays into one unit. These add-ons can result in excessive volume and high costs, and lead to issues with heat dissipation. Frequent software updates to support future AIoT applications can also result in high hardware replacement cost. Clearly, commercial displays and advertising board systems must be improved in terms of simplicity and speed. The major advantage of Intel® SDM is its quick one-piece swap support. With Intel’s unified upstream architecture specifications, suppliers can manufacture matching hardware displays and main boards that make it easy for downstream users to select and integrate systems. This forms a complete supply chain that addresses the largest niche in the commercial market.

Litemax® Displays Offer Rich Experience, Multi-Integration, and Quality, all Paired with the Intel® SDM Module to Effectively Lower Deployment Costs

Litemax® is actively involved in supporting SDM deployment. Nearly 20 years of experience in digital display manufacturing in the LCD industry has given Litemax® the technological know-how to develop its Durapixel high brightness LCD display and the Spanpixel LCD resizing technologies. Moreover, Litemax® places great emphasis on incorporating high-brightness optical design into its backlight monitors. The displays, pairing low power consumption designs with patented outdoor sunlight readability technology, are capable of maintaining continuous, uninterrupted round-the-clock operation for several years. In addition to the long-lasting operations, high-quality materials and low-maintenance requirements, the displays showcase a brilliant quality of high-chroma pictures. Besides the displays, Litemax® also boasts a talented industrial computer R&D team and complete production facility. Where the majority of competitors produce medium- to low-brightness displays or manage a single production line, Litemax® has the industry advantage with its ability to integrate overall product design and progressing technologies.

Litemax® Applications Meet the Needs of the Six Major Consumer Domains

Litemax® has a complete range of applications technology that meet the needs of six major consumer domains in industry and everyday life which together make up the core components of a smart city (food, clothing, life-style, transportation, education and recreation; see Figure 2). For instance, Litemax® have the products to create a smart public transportation system, which is very beneficial for cities since public commuting is a common occurrence. Litemax® offers solutions for a wide range of smart transportation platforms, including passenger information displays, automated ticket vending machines, drive-thru ordering systems, centrally controlled room surveillance and more.

In order to make passenger commuting a smoother experience, high-quality, high-brightness LCD monitors must be used to broadcast dynamic content. For example, for station personnel to efficiently disseminate information in a transit facility, an integrated intelligent system must in place with industrial computers, high-performance displays and a powerful content management system that captures remotely transmitted information and effectively renders it in real time.

At airports, Litemax® flat panel displays can be used to provide information at ticket kiosks, baggage check-in counters, flight departure and arrival information boards and baggage claim areas. In the transportation industry, Litemax® panels provide information on traffic congestion at bus stops; in train stations,
they can display station maps, train departure and arrival times, and seat vacancies. In addition to transport information, flat panel displays can inform travelers about local weather conditions, sightseeing spots, special events, or food and shopping outlets.

In addition to developing industrial and commercial displays, Litemax® designs and technologies that meet the special requirements of shipping, medical and digital panels industries. Litemax®’s high brightness technology, wide operating temperature range and waterproof panel solutions make their displays the ideal solution to many applications. For this reason, Litemax® is considered to be the industry leader in creating new high brightness panel designs. Litemax® has continually expanded its products line from its initial laptop computers and standard display monitors, to today's ATMs, multimedia players, gaming machines, tablets, public phone booths, gas stations, outdoor TVs and mirror TVs, attracting much attention at global exhibitions.

Platform Integration - Building a Smart City Using Smart Applications

The combination of Litemax® panels and Intel® SDM gives an advantage in the competitive sphere of developing AIoT products. They have the products, such as high brightness monitors and touch panels and the computing hardware with Intel® SDM that is ready-for-integration with AI software. These are the new AIoT digital signage displays entering the commercial environment.

A smart city is not just the application of new-generation information technology such as IoT and cloud computing, but is more importantly the building of a new urban ecology characterized by social interaction, unmanned automation and new media platforms, all through innovative AI integration. To take full advantage of advances such as face recognition, smart bus stop signs and smart shelves, this next generation of digital signage needs to evolve from single-purpose display hardware to integrated digital computers capable of adapting to changing environments and offering rapid maintenance updates. This will be the innovation integrated into digital signage (Figure 3).

Public Display System Updates

Commercial Litemax® displays with integrated Intel® SDM are widely used in real public spaces. The compact, slim features of the Intel® SDM adapt readily to display mechanisms and meets system integration (SI) requirements. The Intel® SDM easily slips in and out of displays to overcome problems associated with assembly and disassembly when updating software and hardware components for timetable systems installed in elevated locations. This accessibility is important since the information systems market is entering a period of rapid expansion and development. Performance is key in information systems such as banking systems where users want accurate, real-time information on mobile payments and balance inquiries. Devices that use the Intel® SDM module can be updated on a continuous basis to easily resolve issues as well as to create a better overall experience for businesses and customers (Figure 4).

Using Intel® SDM module will help to resolve new issues that may arise in the future as display devices will no longer be used only as a medium for delivering visual information; but as an interactive media tailored to individual user.

**SI Case Application:**
- **Basic applications:**
  - Advertising banners, one-way information delivery
- **Low-end hardware requirement:**
  - SDM-S/L (Atom)
- **Advanced application:**
  - Increasingly used; open search system, two-way information exchange, camera lens, face recognition/analysis applications, instant advertisement switching and data collection
- **High-end hardware requirement:**
  - SDM-S/L (Core i5)

**Basic applications:**
- Free Internet access
- Lifestyle information
- Balance inquiries
- Two-way information exchange
- Transportation schedules and information
- One-way media playback

**Figure 4.** Actual installation of a Litemax® display equipped with Intel® SDM at a smart application bus stop. The device displays real-time information and features face recognition camera and IC card reader.
Smart Expansion SDM Advertisement System ISDM-5506

In 2018, Litemax® has led the industry in the introduction of integrated commercial display products which support Intel® SDM specifications and feature the latest built-in computers equipped with ten-point touch capability, high resolution cameras, face recognition and the newest AI digital signage to replace conventional static LED monitors and displays. Litemax® ISDM-5506 features a 1,200-nit high-brightness Max RGB (NTSC 94%), high picture resolution, with WIFI transmission and reception support (Figure 5). This monitor is the next generation of multifunctional, all-in-one digital signage designed for commercial advertising. It is suitable for a broad array of installation locations including offices, gaming arcades and can be used for a range of transportation systems including, subways, train stations, airports and bus stops. This smart signage replaces static displays that only show fixed messages and provide single-directional marketing for the storefront where the display is located. With the smart expansion SDM, advertising systems can play a brief introduction to all the stores in a building as well as share updates on local traffic and transportation. These systems can also be used to support advertising for additional business opportunities.

Litemax®, Pioneer in Smart Digital Signage (AIoT) Integration

Litemax® is the owner of the world-class patented – Advanced Brightness Technology (ABT) and has led the industry in developing the first series of 1,000-nit high brightness LED backlight panels. It has incorporated its innovative technology Advanced Optibond Technology (AOT) to prevent compromised brightness due to reflection when LCD panels are placed under bright lights or in direct sunlight.

About Litemax® Electronics Inc. TWSE: 4995

Established in August 2000, Litemax® Electronics Inc. is a manufacturer of professional high brightness backlight displays, LCD displays and high brightness LCD monitors. When global LCD TV markets began to take off, opportunities opened up for the production of high brightness display where Manufacturers began to develop high brightness backlight technology to meet future demand across LCD TV market applications. Compared to brightness levels of less than 400–500 nits in the typical LCD panels and displays of today, Litemax®’s patented optoelectronics technology not only elevates panel brightness, but also improves the line of sight, viewing angle, color saturation and contrast of the product. With their many features, Litemax® high-brightness products always provide optimum visual effects across a wide range of outdoor applications. Its ABT technology also completely counteracts the problem of reflection in bright outdoor lighting while also conserving power by adjusting brightness in accordance with the light intensity of the environment.

Litemax® excels its competitors in the global market, including South Korean and European manufacturers. In the LCD industry, Taiwan has a cost advantage due to a mature upstream and downstream supply chain and complete component technology. Third party suppliers who are rich in R&D capacity, are willing to participate in joint development for areas such as optical film, cooling modules, LED modules and media players, that help to quicken the product development schedule and reduce costs.

To learn more about Litemax®, please refer to our website: https://www.litemax.com

Looking for an appropriate solution? Please contact Intel®, or take a look at these online references:


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