SAMSUNG

White paper:

The ultimate guide to using signage for public communications



Introduction

Governments at all levels — from local to national — provide a wide range of essential services, and civil servant communicators are steadily challenged to keep citizens informed about what's new, what's changed and, more generally, what's going on.

It's impossible for government communicators to keep all of their messaging current using printed material. The internet works, but only if people can find their way to a site and then drill down to the right page or pages in what can be HTML labyrinths. By comparison, digital signs — prominently placed and updated easily or even automatically — can effectively and cost-efficiently reach the masses where they are and deliver timely, need-to-know messaging.

Whether flat-panel displays at information counters and welcome areas, information kiosks in busy public spaces or video walls in everything from first responder command centers to the lobbies of major buildings, digital signage has been widely adopted by city halls, regional authorities, state capitols and the many branches of the federal government, including the Department of Defense.

This white paper explores how and why digital signage technologies have been widely adopted and how they're used in diverse ways. The paper also looks at the cost-benefit arguments and explores the many technology options — from single LCD screens to wall-filling direct-view LED displays.

Rationalizing costs

Display and computing technologies have dropped drastically in cost in recent years, but there's no question the overall price for a printed poster is still substantially less than the cost of a digital sign of the same dimensions. However, the argument for digital bears fruit when communicators start thinking about the number of times that poster needs to be updated or changed out — and all the costs associated with making those changes.

Consider a state government branch office that has five key messages it needs to relay to visitors about subjects like services available, operating hours and policies. With every change in messaging to each poster, this happens:

- Staff or a contracted agency designs new messaging and gets it approved
- In-house or third-party printers produce the new poster



- The posters then get shipped and delivered to one or multiple sites
- Staff set aside normal tasks to take down old materials and put up new messaging

Costs add up — including the financial cost of production and shipping and the cost of resource time. Putting up posters may mean getting access to locked glass cases, climbing up ladders or working around other challenges.

By comparison, once a digital signage display is in place, updating is all done digitally, with no printing or shipping costs and no need to seek local help. Those five poster positions at the state branch, and ongoing costs, can be supplanted by one highly visible display that can instead rotate through all five messages in a sequence. If a message is date-sensitive, it comes into the playlist and goes out of it according to preset scheduling.

Steps to update printed assets





Send files to be printed

Posters printed and shipped to location



Staff removes existing posters and places new ones

Steps to update digital assets



Retailers use digital signage to drive promotions and their brand, but the accurate location-targeting and to-the-minute scheduling the technology powers for retail also addresses a massive pain point for store operators — keeping compliance rates high. Compliance is the technical term for the marketing goal of having the right messaging and pricing in place at the right times. A poster that trumpets a buy-one-get-one-free sale is a customer experience nightmare for retailers if it's still in place when the offer has actually ended.

Learn more about MagicINFO, the

software suite that handles the planning,

scheduling and accurate distribution of

content on digital displays, on page 9.

Think of all the circumstances involving citizen-facing staff at government information and service counters — and all the wasted time that might be consumed sorting out disputes — because the information and calls to action on signs is out of date or erroneous.

Digital displays, including interactive displays, enable civil service managers to reallocate their valuable staff to other, more productive tasks, while the technology automates the distribution and even the production of messaging.

Interactive displays also enable offices to potentially extend service hours, create remote service depots via kiosks and offer key services and interactions in multiple languages.

Commercial displays have the added benefit of having three-year warranties, offering more protection and peace of mind, versus consumer TV's that typically carry one-year warranties.



Screens at work

Strategically positioned, highly visible digital signs — from single displays to video walls — are serving a wide variety of purposes at all levels of government. Here are some common use cases:



Command centers

Large video walls give everyone from military and first responders to public utility operators a full view of mission-critical operations. Sophisticated control systems can do many things, such as creating arrays of multiple windows showing camera views and diagnostics screens or tapping into the key performance indicators from management systems and visualizing them in dynamic charting and figures on a screen easily viewed from anywhere in the room.



Crowd control

Government service centers often see heavy foot traffic — all day, every day. The lineups and waits are being eased, informed and guided by data-driven screens that assign wait numbers and provide wait time status updates using queue management technology and highly visible networked screens. Those screens tend to be "sticky" — something people look at repeatedly. That makes them particularly effective for running other key messaging in tandem, like pushing online service options or raising awareness of changes in fees.



On the agenda

Whether courthouse dockets or committee room schedules and assignments at city hall, screens in welcome areas and main corridors help locate and direct visitors. Tied into facility and other management systems, screens are updated automatically — taking the burden off site-based staff to steadily update notice and agenda boards.



Finding the way

Interactive screens help visitors find their way around busy federal, state and municipal building complexes, as well as publicly run facilities like museums and visitor centers. In multilevel facilities and building campus settings, digital wayfinding screens offer searchable directories. They offer guides on how to get to the agency office they need, and can even push walking directions to smartphones.



Language options

English and Spanish are not always the first languages of people visiting government buildings. Multiple languages are loaded on interactive displays that can provide key and frequently sought information in languages common to larger immigrant groups in the area. For example, an interactive screen loaded with answers in Somali would be valuable in the Minneapolis-St. Paul area, the adopted home for many refugees from the Horn of Africa.



First responders

While department headquarters may have central command and control rooms with large video walls, smaller stations and satellite bureaus are using flat panel displays that show digital dashboards. Loaded with mapping, camera feeds and direct tie-ins to key software platforms, the screens heighten situational awareness and improve response times for firefighters, police and emergency medical services (EMS).

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Moving people

GPS, sensors and other technologies are enabling government authorities at multiple levels to provide real-time updates on arrivals and departure schedules — bus, rail air and water. From LED and LCD video wall information boards in main terminals to outdoor-ready displays on station platforms, networked displays help keep passengers moving. Digital displays are also being used to blend conventional transport services with very contemporary information, like the availability of ride-share cars, docked bikes and even scooters in the immediate area.

Rapid alerts

At every government level, screens can be used to instantly show alert messaging and instructions in the event of weather, health or safety threats. Outdoor-ready displays being used in public plazas and along main thoroughfares to promote services or generate ad revenue are being equipped with internet of things sensors that can do "sniff" for chemical or gas leaks, or "listen" for distinct noises, like gunshots. Alerts can be triggered from those readings automatically, or sent to live operators for review and action. Public screens can also have camera-based systems that can analyze vehicle and pedestrian traffic and help inform urban planning decisions.



Building community

Whether state museums and visitor centers, or small city recreation centers and libraries, there are plenty of events available to the public happening every week. Screens across government facilities raise awareness and drive participation in scheduled presentations and programs.



Engaging and informing staff

Can't-miss screens relay everything from announcements, job postings and policy changes for staff who rarely occupy a desk and may not have a government-issued email address. They're also effective in day-to-day operations, even being used in landfill stations to visualize information on arriving trucks that is more normally printed out and attached to a clipboard used by gate attendants.



Managing Occupancy

Sensors tied to digital screens can log, analyze and control occupancy levels for buildings and rooms that may have restrictions based on health or fire safety. Using anonymous, camera-based analytics screens at entries can do everything from meter access to a DMV branch to showing in graphs the real-time number of study desks available in a library.

Big spaces, big needs

Direct-view LED display technology has expanded from highway billboards and stadium scoreboards to high profile displays illuminating the major crossroads of cities of all sizes, as well as busy government-run facilities like international airports, railway hubs and convention centers.

LED makes several things possible:

Grand scale: Visuals can be as large as needed to deliver impact and not be constrained by a specific shape. A direct-view LED display can fill the full, main wall of a grand building lobby. It can line the header above the gateway to airport or rail gates. It can be the cladding on a building's square or even round support columns, or act as a huge, dynamic false ceiling — creating a sky where there isn't one.

Seamlessness: Direct-view LED video walls are assembled like building blocks, stacked and tiled to realize the intended shape. They are frameless, which allows for visuals uninterrupted by the seams or gridlines common when other display technologies are joined to make larger visuals.

Optimization: The visual performance and core design of indoor and outdoor versions of direct-view LED display technology can be very similar, but outdoor displays are engineered to operate happily in any weather conditions, and to visually overpower even direct sunlight. Indoor versions may not have the same brightness properties and assume environmental conditions are controlled and predictable.

Both indoor and outdoor displays are rated, specified and sold based on what is called pixel pitch — the distance in millimeters between each of what can be millions of LED light chips on a video wall.

Costs for outdoor displays, in particular, can be substantially reduced by specifying a pixel pitch that is suitable for the average distance of viewers. For example, a standard rule of thumb is equating 1-millimeter pixel pitch with 10 feet of viewing distance. So, a 10-millimeter display is suitable when the average viewer is 100 feet away, while a 6-millimeter display will cost more in that situation, but not look any different than the 10-millimeter when viewed at 100 feet.

Realizing value

Direct-view LED costs have dropped dramatically in recent years — owing to manufacturing advances, the maturity of the technology and increasingly widespread end-user adoption that is giving manufacturers the economies of scale needed to lower prices.

The greatest factor in cost tends to be the density of pixels, as finer-pitch displays have more LED light chips, which means more baseline component costs and longer manufacturing times. Newer technologies, like microLED, come at a premium because of that pixel density, but also because the technology itself is relatively new and not yet mainstreamed.

In general, direct-view LED is more expensive than tiling LCDs to create a video wall, though the cost difference is narrowing. LCDs specifically designed for video walls have super-narrow edges or frames (bezels) that result in minimal seams intersecting the joined displays in a wall.

More common and less costly conventional flat panel displays, tiled together as video walls, result in very noticeable gridlines that can diminish the visual impact and even the readability of the messaging on video walls.

While upfront costs tend to be higher, LED offers much longer operating lives – so operators can start to think in terms of cost per year. LCDs typically have operating lives of 30,000 to 60,000 hours, while LED can last 100,000 hours, or roughly 10 years.

Used as video walls, LCDs also require high ongoing maintenance costs for calibrating the screens – doing the technical work to make all the display panels match in terms of brightness, contrast and color settings. LED has far fewer demands on maintaining consistent visuals.

Government authorities justify and rationalize costs for large digital signage display projects in different ways:

Operating efficiency: Whether it's a control room video wall or a string of single displays in a public access facility showing event schedules and notices, long-term budget calculations can easily reveal how shifting from analog to digital saves on operating costs and resource requirements to keep information up-to-date and accurate.

Better, more timely information on screens can also make city and state services more efficient and optimized. For example, inner city traffic congestion can be reduced by a network of digital signs that make motorists aware of real-time occupancy rates at parking garages in the immediate area getting cars off the street faster. They can also enhance safety, stopping rushing at subway platforms when late-arriving riders can see another train will be there just minutes later.

The importance of pixel pitch for indoor displays

Pixel pitch has an equally important role in indoor applications. LED displays are generally labeled as "fine pitch" when the rating is at 2.5 millimeters or smaller, and pitch measurements for premium LED video walls can now be below 1 millimeter. At that rating, a screen viewed at 10 feet or even less can look as crisp and vibrant to viewers as a large flat panel TV.

In government settings like command and control rooms, fine pitch displays of 1 to 2 millimeters — tuned to the viewing distance of the wall from operator desks — are capable of showing crisp visuals, including text, and granular visuals, such as schematic drawings.

For demanding, premium control room applications that require large groups to see and make decisions based on high resolution visuals such as aerial imagery, mapping, 4K video or detailed drawings, Samsung's The Wall brings grand-scale, living room quality visuals to operational work settings.

Using microLED technology, micron-level light pixels are set in high contrast black backgrounds to deliver incredible detail. While the pixel pitch of some conventional LED displays may technically be finer than The Wall's pitch, the combination of tiny light chips and black backgrounds delivers superior visuals.

As with other direct-view LED technology, The Wall is inherently modular, ready to build to the scale and dimension the job demands. But versions also ship in preconfigured shapes as large as 583 inches diagonally — a whopping 48 feet!



Public-private partnerships: Municipalities have for many years entered partnerships with media companies who take on the capital, deployment and long-term operating costs of displays along roadways, at transit shelters, in busy plazas and in public spaces like rail terminals. Often, the agreement sees a percentage of the messaging rotation on screens made available to the public partner, as well as a share of the advertising revenues generated by the media company. That money, often guaranteed in the media concession agreement, goes into general revenues, or can be assigned to offset costs of the municipality's other non-media digital efforts.

Cost offsets: Local governments have installed permanent outdoor LED displays in public plazas to serve a variety of purposes, offsetting the initial costs in a few ways. With public viewing parties for major sporting and cultural events growing commonplace, a permanent screen can quickly prove less costly than renting equipment and having teams install and manage temporary screens. That big screen can also be leased — just like space at municipal theaters and recreation centers — to third-party event organizers. During periods when the screen is not scheduled for specific uses, the "time" on the display can also be made available to an out-of-home media company to sell advertising.

Making smart screen choices

Services and scenarios across different levels of government are diverse, and the right digital signage technology needs to align with the needs and dynamics of the location.

LCD Displays

Generally, individual LCD panels are best suited to indoor applications that involve:

- viewers being in close proximity, with fine detail like text displayed
- the use of interactivity in the case of touchscreens

Samsung also designs and manufactures LCD displays engineered to face outdoors in building windows, as well as ruggedized, outdoor, weather-proofed displays ready for use in city plazas. In both cases, the backlighting arrays inside, which illuminate the LCD, are bright enough to overcome direct sunlight and deliver vivid visuals on even the sunniest days.

Most commercial Samsung displays now ship with the media player hardware embedded inside, making the screens "smart" and reducing the upfront costs of screens. Along with negating the need for an external media player, which can be anywhere from \$200 to \$1,000 or more, smart displays install faster and minimize maintenance headaches by reducing the potential points of field failures to a single, rarely troublesome power cable.



Direct-view LED displays

Direct-view LED displays enable scale and shape and are being used by government communicators for scenarios that require a big visual impact — indoors or out. Specifications vary, but generally LED is engineered to be brighter than LCD and more easily handles glare, heat, rain, snow and wind.

While premium LED products like The Wall approach LCD in viewing clarity, even when up close, most LED displays are engineered and intended to be viewed at a distance. Fonts that would appear crisp and legible on a 4K LCD display may appear broken up and difficult to read if shown on an LED display and viewed in close quarters.

Fortunately, it's possible to mix and match screen technologies across a digital signage network, so it's not a case of having to choose one display technology or the other. It's also fortunate that technology companies like Samsung have increasingly harmonized their solution, so that diverse components work seamlessly with one another.

Displaying the message

Government and communications IT teams tasked with developing digital signage network plans will discover they need to source and match a dizzyingly diverse set of hardware and software components, offered by scores of different vendors. It can get confusing quickly and present a big challenge in sorting out which products and vendors will work well with each other.

The less troublesome and more effective approach is using a technology supplier that can bundle and deliver a full range of solutions that have been expressly designed to work together, and come from a single source for information and customer support.

Samsung's rich digital signage solution set includes embedded media players, storage and connectivity, a vast range of displays that meet different needs and price points, as well as a full content management software suite that's been under development, refinement and enhancement for more than a decade.

Called MagicINFO, the software suite handles all of the planning, scheduling and accurate distribution of content to anything from a single LCD display to massive LED video walls.

MagicINFO software includes strong remote device management tools that enable networks of screens to be easily managed across large footprints, and at multiple sites in a city, state or country. Good device management is critical in maximizing uptimes for screens and reducing the troubleshooting time and related cost impacts for IT support teams.



MagicINFO also has add-on modules for handling and displaying real-time data, like transit and traffic status, viewer analytics and reporting.

Originally an enterprise solution installed on site and managed by customers, MagicINFO also now has a cloud-based version centrally managed by Samsung and available via subscription licenses. That lowers the burden for work-stretched IT teams and also flattens costs on a month-to-month basis, which can work better for government finance teams that want to put the technology in predictable, fixed operating budgets instead of upfront capital budgets.

Government-run initiatives — particularly those involving the military, public safety or records — have an acute need for security, and that's built into Samsung's smart digital signage solutions.

Tampering with key components like a media player presents little risk because it is embedded in a sealed display unit. The overall smart signage solution is integrated with Samsung Knox, a military-grade enterprise security platform that protects applications and data by strictly defining what each computing process is allowed to do and what data it can access.

Making it all work

The many functions and services delivered by governments, at all levels, demand effective, accurate and always-on messaging. Displays are central to any solid solution, but it's important to have a well-matched, focused technology set.

The uncomplicated, potentially trouble-free approach to developing a sign network for the city, state or a federal agency is single-sourcing a solution that uses technologies designed to be bundled and seamlessly working together.

Samsung is the most known, trusted and established brand in digital signage, and it's readily positioned to help.



Communicators working for government agencies, along with IT teams, should be thinking about these things:

- What are the core problems that need to be solved?
- How will networked digital displays resolve those problems?
- Where is communication most needed, as opposed to where screens might look most impressive?
- What type of content is needed? How can it be generated cost-effectively and perhaps automatically?
- What's the available budget, and how can the investment be optimized?
- Who "owns" the network and will be responsible for its growth and upkeep? Who needs to contribute to it, and how will they do that with the proposed software?
- How will the users know if what's done is successful and making an impact?

It's possible, certainly, to mix and match different technologies and service providers to piece together a workable digital signage solution for any level of government. But...

- Will it be secure?
- Will it operate reliably and be appropriately supported by the technology companies?
- When there are problems, will the media player, display company and software provider collectively "work" the issue? Or point fingers?
- Are any upfront savings nullified by downstream operating issues, like hardware failures or software problems?
- Are the technologies best of their breed?



Secured screens

Samsung's smart digital signage platform involves all-in-one displays with media play-out, connectivity and storage components built into the screen enclosure. That means tampering with key components like the media player is almost impossible because it is contained within a sealed unit. Samsung's commercial displays differ from smart TVs, and don't ship with the features that offer convenience to consumers but create potential vulnerabilities for security-conscious projects.

Smart signage displays employ Samsung Knox, a military-grade enterprise security platform that's built in from the chip up. Designed initially for smartphones and other mobility devices, and extended to digital signage, Samsung Knox protects applications and data by strictly defining what each computing process is allowed to do, and what data it can access.

Knox is integrated with the software layers of a smart digital signage network to separate data and constantly check the integrity of the device. These defensive layers detect any tampering to ensure that the data is secure.

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