Today, the widespread availability of 3G and 4G cellular or wireless broadband networks enables digital signage to be deployed virtually anywhere. Combined with cloud-enabled Software as a Service (SaaS) network management and content delivery systems, 3G and 4G wireless broadband networks are propelling digital signage deployments at an accelerated pace. In countless venues, digital signage networked via wireless broadband cellular signal penetrates hard-to-reach locations, newmarkets, and can achieve a faster return on investment.
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With support for over 350 modems on more than 70 different carriers, **CradlePoint** defines excellence in connectivity. Specializing in failover, machine-to-machine (M2M), and primary connections, CradlePoint’s solutions are purpose-built for PCI compliant networks. CradlePoint is the first to pioneer and fully enable high-speed LTE in its solutions to maximize the potential of the cloud for businesses worldwide.

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All photos courtesy of Cradlepoint, unless otherwise specified.  
Written by Richard Slawsky, contributing writer, DigitalSignageToday.com  
Tom Harper, president and publisher  
Joseph Grove, executive editor  
Rebecca Bearden, custom content project manager
Introduction

For years, digital signage deployments were shaped by the limitations of the on-site network connection. If the signage was to be on a network — that is, if it required a remote update and management component or needed to be remotely monitored — then it had to be located in an area that supported a hardwired network or Wi-Fi infrastructure, complete with either hubs and cabling or individually configured Wi-Fi access points. Cabled and Wi-Fi networks dictated how digital signage was deployed, but also where it was deployed.

That meant networked signage was found only in sites where the deployer or operator had access to, and control over, the on-site network. In many cases, it wasn’t feasible to tap into or create a remote, stand-alone network for financial, regulatory, technical, security or other reasons. The inherent complexities of on-site, hardwired or Wi-Fi networks has constrained and limited the deployment of digital signage in virtually all markets including retail, education, banking, corporate communications, manufacturing, health care and others.

Cabled and Wi-Fi networks represent expensive and complex deployments, with increased costs and decreased practicality and flexibility. Hardwired infrastructure continues to be a burden for IT departments to set up, especially in cabling fees, not to mention ongoing management. Add to that the extra security, bandwidth limitations and network-load balancing typically necessary to accommodate a digital signage network riding a company’s Internet or intranet backbone and the complexity increases. And finally, most digital signage buyers are from the communications side of the business, and typically see increased IT investment and maintenance expenses as something to be avoided, if at all possible.

Some locations couldn’t support networked signage due to the inability to connect to the Internet. Running a cable may have been too difficult, or Wi-Fi access points may have been unavailable. In addition, transitory or mobile systems — systems that are constantly on the move and can’t be tethered to a fixed location — also can’t continually search for a Wi-Fi connection. For such systems, connectivity was impossible.

Digital signage networks that run on cellular-based broadband Internet support provide all of the capabilities of a hardwired network without its inherent limitations.

Impossible, that is, until recent developments in cellular networks.

Today’s 3G and 4G cellular networks offer unprecedented advantages to digital signage networks. Cellular technology makes digital signage more cost-effective, practical and flexible. Digital signage networks that run on 3G/4G wireless broadband Internet support provide all of the capabilities of a hardwired network without its inherent limitations.

And today, having a digital signage network on a secure and separate network — a goal that is often unattainable on cabled
or Wi-Fi networks without extensive investment — is critical.

Thanks to this new technology, digital signage can be deployed virtually anywhere, even in the most remote locations. New meaning is given to the term “remote control and management.” The reaction time of the network is shortened, maintenance alerts are provided instantaneously and the cost and complexity of the network is cut to manageable levels — whether the network is in an office in Manhattan or the most remote rural regions, as long as a cell tower is accessible.

Recent developments in cellular technology portend a greater array of features for digital signage networks. The advent of 4G, the fourth generation of cellular-based wireless broadband Internet connectivity, promises to bring a new level of content to networks, including increased bandwidth, interactivity and on-demand video. Although 3G networking provided a breakthrough for networks of digital signage, 4G is expected to be the “tipping point” for a new generation of wireless digital signage deployments as it eliminates any remaining variance between hard-wired, high bandwidth networks.

So what is a 3G/4G wireless broadband or cellular-based network? And what can it do for your digital signage deployment? Those are the questions this guide is designed to answer for both the business-oriented and technology-focused reader.
Why integrate digital signage through a network? Today, the vast majority of digital signage deployments are networked. The advantages of a networked digital signage system are far greater than simply the cost savings; such systems also add value by their ability to update content, nearly in real time, and increase its relevance to the viewing audience.

The days of updating signs by flash drives and other manual, non-networked approaches have become a thing of the past.

“Networking your digital signage deployments gives the IT organization the highest level of control and security to deploy, manage and upgrade devices in the field. And, with the scalability of a networked digital signage solution, the size of the deployment does not matter. Plus, with GPS-enabled location services and cloud-based management applications, there’s never a concern that the devices are where they should be and working as intended,” said George Mulhern, CEO of CradlePoint, a global provider of 3G/4G network solutions.

A network enables digital displays to send and receive data to and from a central point of control, typically managed by the network operator or administrator. Most networks today, by and large, are Internet Protocol-based, or IP-based, networks — meaning that each display is given its own unique IP address and uses the Internet as its primary means of communication.

Unfortunately, traditional IP networks, such as Ethernet, Wi-Fi and satellite networks, have limitations. Wi-Fi and Ethernet networks require infrastructure and tech support. Other problems include high cost and lack of convenience.

For example, it’s not feasible or always even possible to install Ethernet or Wi-Fi in some locations, such as an outdoor digital billboard; a vendor’s endcap at a wholesale store where that vendor, typically the “brand,” has absolutely no access to the retailer’s in-store network; a manufacturing facility that has to be recabled; a temporary display booth at a convention or in a shuttle bus, taxi or other mobile environment.

With the advent of 4G networks, bandwidth on wireless broadband networks is no longer a limitation and provides equal, if not greater, bandwidth than today’s wide-area networks. A 4G network essentially delivers the equivalent bandwidth of five T-1 lines, without the need for on-site network infrastructure, setup or ongoing maintenance.

Having an on-site network infrastructure can cause a lot of headaches. Operations likely will be disrupted in some form as cable is laid and furniture or equipment is repositioned to facilitate the installation.

The network will have to be tested, software must be loaded and once it’s activated, the network will have to be configured to the
devices it is supporting. The attention to these networks doesn't stop with installation; ongoing support and management also is required, costing time, manpower and the allocation of what are typically scarce IT resources. And delays in dealing with a network issue might set the stage for “self help” by local store staff, who could inadvertently make a minor problem much worse.

That’s where a 3G/4G wireless broadband network comes in.

Cellular networks, also known as wireless broadband, data services or simply 3G/4G networks, have become much more ubiquitous in the market over the past several years. Carriers such as AT&T, Sprint, T-Mobile, and Verizon deliver affordable, reliable and secure broadband Internet access virtually everywhere.

Over the past several years, every major carrier has created an M2M (machine-to-machine) division to facilitate the adoption of 3G and 4G networks into embedded computing systems. The focus of these M2M organizations is to work with businesses who integrate modems directly into devices such as network routers and adaptors “machines” which are controlled by a back-end application which also is considered a “machine.”

Many industry analysts are now predicting that M2M is a high-growth area for many of the carriers, as it represents a new and previously untapped market for them. According to a November 2012 report from UK-based IMS Research, the number of M2M connections is expected to hit 326 million by 2016 from about 107 million in 2011 as mobile operators respond to the slowdown in their traditional markets by focusing on new growth opportunities.

Various factors are enabling and driving cellular M2M market growth, according to IMS Research, including government regulatory initiatives, the need by corporate adopters to boost efficiency and the falling cost of M2M services and components.

“Mobile operators are not simply providing managed connectivity services to the cellular M2M market but increasingly are ‘connecting the dots’ among M2M ecosystem players, including suppliers and developers – and this benefits the market as a whole,” said Sam Lucero, a senior principal analyst at IMS Research.

The volume of cellular M2M subscriptions is projected to increase almost fourfold between 2010 and 2016, from 72m to 282m.

Source: Pyramid Research
CHAPTER 1  Networking and digital signage

Today’s ubiquitous availability of 3G networks, combined with the emergence and accelerated pace of 4G network accessibility, has made cellular connectivity a viable option for virtually any type of digital signage deployment. As access has increased, prices have come down, making affordability and bandwidth of this network choice no longer a factor.

Cellular networking can be deployed in a number of configurations. A data services modem, for example, can be used to connect each media player directly to the cellular network, while a cell-to-Wi-Fi device can be used to create a virtual Wi-Fi access point for up to five media players equipped with Wi-Fi adapters, each of which drives an individual display. This is particularly desirable in situations where a group of displays are in close proximity, and financially advantageous in that only a single monthly cellular data service fee is required.

All major North American carriers, including AT&T, Sprint, TELUS (Canada), Verizon Wireless, T-Mobile, Bell Mobility and Rogers (also in Canada), offer 3G, and either support for, or availability of, 4G-based cellular broadband services. Many of these companies are investing considerably in their 4G networks. Whether it’s Sprint’s 4G-based WiMax, and recently announced support of 4G LTE networks, or Verizon Wireless’s now leading deployment of 4G LTE (Long-Term Evolution) network technology, 4G networks have officially landed and are taking the market by storm.

Cellular broadband is rapidly changing the way digital signage networks are configured. Now, more than just rich and relevant content, two-way communications can be incorporated for video and other solutions, without the traditional issues of wires and IT burdens. And all of this occurs with the dynamics, flexibility and economy of wireless.

Before deploying cellular signage, though, it may help to understand the available types of cellular broadband networks, as well as the terminology.

4G networks
The latest development in cellular technology is 4G, or fourth-generation standard.

4G could very well be a critical tipping point for the digital signage industry. For digital signage it is the ultimate “coming of age.” By utilizing 4G networks, one of the last limiting factors of deploying digital signage — low bandwidth — has been removed.

Wireless broadband (sometimes referred to as cellular based) digital signage can now offer the same robust features of the highest-end wired solutions at a much lower cost to build and operate.

Today, most carriers are touting that their 4G LTE, WiMAX or HSPA+ networks deliver speeds on the order of 10 times faster than the previous generation 3G networks. The significantly increased bandwidth promises to add a whole new level of

Enterprise cellular M2M connections worldwide will surge from 81.8 million in 2011 to nearly 217.5 million in 2015.

Source: Yankee Group
CHAPTER 1 Networking and digital signage

A lounge is a great location for digital signage, as it assures a captive audience.

experiential and contextual-based content, including on-demand videos, to cellular digital signage, enhancing a network operator’s ROI by delivering greater content impact with far less on-site infrastructure, management and maintenance.

According to Dallas-based research firm Parks Associates, global 4G/LTE subscription will top 560 million in 2016 from just 9 million in 2011. As of June 2012, 83 carriers had launched LTE networks in 43 countries with 40 more carriers expected to have deployed LTE by the beginning of 2013

Although theoretical limits are interesting to compare, a more pragmatic view of what users can expect to realize from these technologies is essential.

According to the Verizon Wireless LTE Innovation Center website, “With Verizon Wireless’ 10 + 10 MHz implementation, 4G LTE will be supporting average data rates per user of 5-12 Mbps in the forward [download] link, and 2-5 Mbps in the reverse [upload] link. … 4G LTE will truly enable video application on the downlink as well as uplink — including but not limited to video-sharing, surveillance, conferencing and streaming in higher definition than is possible with existing 3G technology today.”

Using the existing Sprint 4G WiMax technology, comparable data rates of 3 to 6 Mbps for download with a peak of 10 Mbps, and uploads of 1 Mbps with a peak of 2 Mbps are available.

How will 4G LTE affect the digital signage industry? It is expected to usher in a new generation of digital signage products and services that offer new and compelling advantages for businesses and their customers.
3G/4G connected digital signage solution provides network operators, vendors and end-user customers with both compelling business value and significant technological advantages. With 3G networks, and the growing availability of 4G networks, customers no longer have to worry about IT and networking infrastructure coming between communication messages and their targeted audiences.

With 4G emerging quickly in the marketplace, the path to high-bandwidth, persistent connections will deliver new capabilities for digital signage customers and solution providers alike. High-definition video streaming, live point-to-point broadcasting and other innovative capabilities that have been available in hard-wired, onsite networks will now be available in the wireless world.

Those who have already deployed cellular digital signage solutions have discovered the silver lining in cloud-based computing. The existing 3G data services network can be leveraged, and many of the costs and complexities associated with traditional on-site networking options, such as Ethernet and Wi-Fi, can be removed. And with a secure and available path from 3G to 4G networking, customers realize both today’s advantages that include high reliability, security, freeing up IT staff, flexibility and mobility, while ensuring high-bandwidth availability into the future.

**Reliable and ready to go**

The important question a digital signage network deployer has to ask when evaluating the different types of network connections is this: Why go through the hassle of deploying a wired network connection when a wireless one already exists and is easier, faster and less costly to implement?

“Every major carrier is offering 4G cellular-based broadband services now,” said CradlePoint’s Mulhern. “When you think about the man hours, the costs and the disruptions of having to pull cables for an Ethernet LAN-based network at each location where you plan to deploy signage, you’re going to be hard-pressed to justify that expense over the ease and simplicity of cellular.”
In fact, cellular carriers have already provided the infrastructure, spending billions of dollars to build the equipment needed to make this network possible. The base stations are there, the cell towers are there, the radio equipment is there. The project is 90 percent complete; all that remains is for the digital signage deployer to make the decision to leverage the speed, flexibility and reliability of a wireless broadband signal for networking their digital signage solutions.

Salt Lake City-based YESCO, one of the world’s largest signage and digital outdoor display manufacturers, has pioneered the creation of connected digital signs. YESCO digital signs operate using several applications like heat monitoring, air conditioning, and a self-contained security and surveillance systems that all require network connectivity. Using the COR IBR600 router and WiPipe Central, a cloud-based management platform developed by Boise, Idaho-based network solutions provider CradlePoint, YESCO deploys network-ready digital signs for placement virtually anywhere with the ability to activate, configure, deploy and manage the connectivity of signs from a central location.

“We make some of the largest digital signs in the world, so downtime is not an option,” said Justin Montalto, Network and Wireless Communications Administrator for YESCO. “Coupled with WiPipe Central, the CradlePoint COR IBR600 provides the most reliable network solution for the multiple applications that require connectivity to function in our signs.”

There’s not a lot of equipment to install, saving the deployer a significant amount of time. Unlike conventional IP networks, cellular networking can be completed in a single afternoon — often in a matter of minutes. That’s not the case for Ethernet or Wi-Fi, or even satellite solutions.

Highly secure

The complicated web of cables and hubs that make up Ethernet networks often can tempt the digital signage deployer to take a quick shortcut when setting up the on-site network. Instead of developing a separate network to run the signage, the deployer might choose to connect the network to an existing network in the store. In essence, the signage will piggyback on the operational network that runs the store’s POS systems or back-office automation platform.

“When you think about the man hours, the costs and the disruptions of having to lay out a Wi-Fi or pull cables for an Ethernet LAN-based network at each location where you plan to deploy signage, you’re going to be hard-pressed to justify that expense over the ease and simplicity of cellular.”

— George Mulhern, CEO, CradlePoint
This is not necessarily a bad thing; much of the necessary infrastructure is in place, and all the deployer needs to do is connect to it. However, problems can arise quickly. For a start, there’s the issue of security — a big consideration when launching any business endeavor but absolutely critical when it comes to IP networks. Without proper protection, digital signage can provide a backdoor for hackers to get into the network. If the digital signage network is on the same network that hosts the deployer’s intranet system, such an intrusion could constitute a massive security breach.

Even more disturbing is the possibility that a digital signage deployer may inadvertently — or intentionally — access proprietary material through the shared network.

“The consequences of combining a mission-critical network and a digital signage network are very real,” Mulhern said. “There have already been reports of a network break-in from digital signage and kiosks that were connected using unsecured Wi-Fi access points.”

“Even worse, consider a hospital where the digital signage network becomes a gateway through which confidential patient information could be accessed. That’s a HIPAA (Health Insurance Portability and Accountability Act) violation, and the hospital could find itself in serious legal trouble. That’s why hospitals are legally required to keep patient information on a separate network protected by a firewall,” he said. “Banks and educational institutions face similar concerns, and are increasingly turning to 3G/4G mobile broadband networks to eliminate the potential security breach associated with wired and Wi-Fi based networks.”

But shared networks are common when conventional IP methods are used. While it’s possible to create an Ethernet digital signage network that is separate from the business network, it is not always cost-effective or logistically feasible to do so. Additional network load balancers, bandwidth throttles and firewalls can be added to these networks, but doing so could result in additional expense and effort from

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**ON-SITE INFRASTRUCTURE**

**versus**

**CELLULAR-BASED**

*Multiplied by hundreds or even thousands of locations, infrastructure-based digital signage networks require significant investment and management as compared to cellular-based networks.*
already overworked IT staffs. Thus, many companies wind up compromising the integrity of their business networks.

Networking with 3G/4G wireless broadband offers a more secure alternative by using a separate network that can be accessed easily and cost-effectively. With a 3G/4G wireless broadband digital signage network, the deployer doesn’t have to worry about bogging down the business network, scheduling content transmission at a particular time or allowing access to private material.

“There’s just no way around it,” Mulhern said. “A shared network might work in some rare instances, but your best bet is placing your digital signage on its own network. Of course, running two networks can be cumbersome when using Ethernet or Wi-Fi connections, making cellular the preferred choice.”

Freeing up the IT staff

A distinct advantage of a 3G/4G connected digital signage network is that it can be managed via a cloud-enabled management application enabling corporate IT to centrally manage and secure the network eliminating costly truck rolls or outsourcing.

By contrast, connecting via 3G/4G networks requires very few component parts — essentially a router with embedded 3G/4G that is integrated with the digital signage solution. The vast majority of the communications infrastructure is packed directly into the cell towers and the carrier networks, which are obviously maintained by the carriers. And while the carriers continue to move their technology to new heights, many providers offer built-in upgrade paths to the latest services like 3G to 4G, making them essentially “future-proof” so long as the routing infrastructure supports the upgrade.

All of this offers a distinct advantage, particularly for a company that can’t provide dedicated, local IT personnel but needs to deploy signage remotely.

“Many digital signage resellers choose a 3G/4G mobile broadband digital signage solution to resell as their own because it eliminates many of the IT barriers and technological costs and complexities associated with traditionally wired digital signage networks,” said Dave Carbert, senior product and business development manager for TELUS. “With our new 3G/4G wireless network, customers can easily deploy and operate a network of displays almost anywhere.”

Cellular Digital Signage

Cellular-based digital signage solutions can be set up in a matter of minutes.
Mobility and flexibility anywhere and any time

Perhaps the most significant advantage of a 3G/4G connected digital signage network is the fact that the deployer can place the signage anywhere; there’s no need to have the signage tethered to cables. Ethernet and Wi-Fi networks may perform at acceptable levels, but moving them presents a challenge if the location is reconfigured. A store manager may choose to move cash registers, product counters, clothing racks and snack machines, but finding a new site for digital signage that is wired into an Ethernet network is limited to where the cable can reach.

“The flexibility to connect with wired and wireless connections provides us and our customers with a sign that is network ready and easier to deploy,” said YESCO’s Montalto. “If a wired line is not available, customers no longer need assume the costs of trenching to find a wired line, which translates into a much smoother installation process.”

All 3G/4G cellular networks are free of those technical barriers. Bottom line: With cellular-connected digital signage, scalability — the ability to handle increasing amounts of data — is not an issue.

The base stations are there, the cell towers are there, the radio equipment is there. All that remains is for the digital signage deployer to make the decision to use the network.
Chapter 3 3G/4G digital signage in the real world

3G/4G mobile broadband (sometimes referred to as “cellular based”) digital signage is fast becoming a popular favorite in real world deployments. Business communicators and marketers broadly agree that 3G/4G cellular-based digital signage offers a wide range of compelling business and technical advantages.

The following are a number of real-world examples of just how 3G/4G networked digital signage is winning the hearts and minds of customers.

Corporate communications

Often, deployers think of 3G/4G networked digital signage as a means of selling or communicating with customers. But it is also a critical channel through which a company can reach its employees and influence its workforce. It can be used as a call to action, a means of distributing information and an emergency notification system, among other uses.

This is especially important for employees who do not use computers in their work and therefore have no access to the company’s intranet. Older video bulletin board systems and cabled internal television networks are being replaced with more modern, sleek digital signage solutions that offer significant advantages in simplicity of deployment and ease of operation.

With a cellular solution, human resource managers, corporate communications directors, and others procuring digital signage need not request or allocate resources from their internal IT organizations to deploy and manage their digital signage network.

Benefits of 3G/4G connected digital signage for corporate communications

- Easy to deploy and setup without IT setup and management
- Extreme portability to deploy in remote locations
- Ability to deploy in areas incapable of supporting cabling such as manufacturing
- Use of digital signage in shuttle buses and other mobile environments
- Flexibility to move displays as facility layouts change
- Completely separate from corporate network, eliminating security risks and shared bandwidth contention
- Fully manageable from a centralized location

Brands in retail stores

The fact that 3G/4G connected digital signage networks work on a separate network from a company’s business network (one that’s dedicated to day-to-day operations such as e-mail, server or Internet connection) is significant — especially to brand vendors whose products line the shelves of a retail store.

For the first time, vendors can deploy their own 3G/4G connected digital signage network easily and cost-effectively inside a retail outlet. This means that brands can control their own programming, scheduling content by time of day or day of the week, generating a powerful opportunity. Now, the brand can reach out to the specif-
ic demographics and psychographics of its consumers at the right time and place.

By using a cellular network, the brand’s network and the store’s network are separate, meaning that the retail store doesn’t have to worry about the brand vendor viewing proprietary information and vice versa. The opportunity for the brand to take control of its own destiny and to deploy its own signage — often termed “endcap networks” — can mean increased sales and brand awareness.

The retail chain store

The possibilities for cellular digital signage in the retail environment are virtually unlimited. Retail stores generally sell a host of products from different manufacturers, and digital signage can run advertisements for any of those products. Some stores make money by selling advertising space on their signage to the vendors whose products are on the shelves.

Retail stores that have their own brand can use digital signs effectively by creating a customized buyer experience. The signs can feature experiences, pricing and values that are unique to the hosted environment and alert shoppers to special sales, new product offerings and customer reward plans.

A 3G/4G connected digital signage network offers a distinct advantage to the retail industry because of its simplicity. Most retail stores don’t employ an on-site IT department, so the lack of infrastructure is a plus. The benefits include control, flexibility, stability, easier replication and replacement and ongoing updates to media.

3G/4G connected digital signage networks can significantly enhance the customer experience, building brand value and sales at the shelf. Providing the content needed to attract and influence consumers at the point of decision can make a significant difference in the sales outcome. In addition, a manufacturer can provide a direct channel to train sales associates. And finally, business intelligence statistics acquired via the digital signage network can be used to understand traffic patterns, browsing to buying activity and many other customer behaviors.

Healthcare

Healthcare environments are a special category for 3G/4G cellular-based digital signage due to the strict guidelines for secure networks they must adhere to. The Health Insurance Portability and Accountability Act (HIPAA) mandates that a patient’s health data be kept in the strictest
of confidence. A hospital that violates that privacy, or allows such a violation through security negligence, could find itself in the center of a costly lawsuit.

Hospitals, pharmacies, doctors’ offices and other professionals in the healthcare community benefit from the separation of cellular networks from on-site business networks. The risk of sensitive data finding its way into the wrong hands, either maliciously or accidentally, is reduced; cellular networks feature remote management without the headaches of data mismanagement. In these environments, cellular-based digital signage systems are on a separate network and therefore HIPAA-compliant; are kept separate from the existing on-site IP-based network; provide the flexibility to move displays as layouts are rearranged or moved to new locations and can be used for staff training during patient off-hours.

**Education**

3G/4G cellular broadband services also work well for communication and broadcast systems on academic campuses. Cellular-based digital signage can be deployed quickly and easily on both private and public educational campuses and can be used to immediately warn students of an emergency, such as severe weather or an on-campus fire, giving them critical information about what to do. A system with built-in cellular-based IP networking would not require rewiring the campus.

**Ad network operators**

3G/4G cellular-based digital signage also is being used to reach specific communities. By narrowcasting, signage deployers are broadcasting specific, targeted information to individual neighborhoods and regional chains. Owned and operated by a growing number of independent network operators, these TV-like ad-based networks feature local advertisements and news items that are important to the community as well as product placements by well-known brands. Local businesses can be featured, and local concerns can be addressed.

Whether developing a cross-country specialty network or a cross-town advertising network, using cellular-based digital signage makes sense; it enables deployers to target and reach an audience with}

**Cellular-based digital signage enables deployers to target and reach an audience with valuable time-to-market metrics and faster program ROI. It’s an ideal solution for the new generation of digital out-of-home, or DOOH, advertising networks.**
valuable time-to-market metrics and faster program ROI. It’s an ideal solution for the new generation of out of home, or OOH, advertising networks.

Vivid Digital Concepts, a digital signage provider based in Ritchfield, Ohio, is using cellular-based signage as part of its digital signage franchise program to equip and enable a growing number of independently owned and operated narrowcasters.

“With the integration of cellular networking integrated into the Vivid Digital signage solution, our network providers can quickly and easily deploy displays throughout their unique region,” said Phil Kubec, president of Vivid Digital. “This dramatically reduces the amount of technical training, support and ongoing maintenance, enabling our franchise operators to focus on what’s really important: selling ad space and scheduling their programming.”

Convenience stores

3G/4G cellular-based digital signage systems have demonstrated that they can significantly increase sales in retail environments, and convenience stores are no exception. One way to increase product and service sales is by using signage to command customer attention at the pump and drive buyers into the store.

Unlike most retail store locations, gas stations and convenience stores typically have limited network access and bandwidth for anything other than their credit-card and register-based transactions. With a cellular network, no additional infrastructure needs to be added or maintained across hundreds or even thousands of locations.

GoGo Cast, an on-demand, out-of-home digital media company, is using its 3G-based dynamic digital signage and advertising insertion solution to help East Side Enterprises’ Shell convenience store chains and others like them to engage customers with meaningful and informative content. GoGo Cast uses Sprint 3G broadband network services that are integrated into its GoSigns.

East Side Enterprises operates Shell-branded gas and convenient stores in Rhode Island and Massachusetts.

“East Side will use GoGo Cast’s unique customer and location data to reach a captive in-store audience, delivering the right messages at precisely the right time to influence buying decisions directly at the point of purchase,” said David Paolo, CEO of GoGo Cast.
Transportation

Transportation and other mobility markets are a natural fit for cellular-based digital signage solutions. A “tethered” network, whether it’s LAN or Wi-Fi, is completely out of the question for a transit vehicle that is continuously on the move.

Whether it’s a taxicab, bus, train, shuttle or other mode of transportation, a 3G/4G cellular-based solution is the only feasible option. In-cab informational displays and intelligent touchscreen devices are becoming more prevalent, and can even offer extended services to their passengers, such as a Wi-Fi access point or GPS-triggered information.

Eugene, Ore.-based Feeney Wireless, for example, offers equipment that is expressly designed for harsh, in-vehicle environments. Its system integrates a cellular radio, firewall, high-speed processor and 802.11b/g access point, all in one device. With solutions such as this, mobile Wi-Fi, serial and Ethernet connections are available in-vehicle, giving the user the ability to connect a variety of devices in any location, including an on-board digital display.

Interactive digital signage systems and kiosk hybrids

An ongoing trend in the digital signage industry is the increasing use and deployment of touch-enabled digital displays. These “interactive” displays are used to further engage customers, or enable viewers to “drive” the screen and select the information in which they are most interested. Often these systems are confused with the more transactional-based kiosks, which typically provide a financial or business transaction. Interactive displays serve a different purpose, somewhere in-between a play-only display and a transactional kiosk.

As these systems are deployed in a variety of environments to engage customers, using cellular-based networking is an absolute necessity. With 3G and emerging 4G networking, interactive displays can be deployed virtually anywhere there is a power outlet, and provide a more compelling and engaging experience.

More importantly, interactive displays can provide audience measurement and voting services that offer real-time two-way audience feedback. This enables brands to collect and measure opinions and reactions to promotions that are playing and to receive answers to direct questions that are posed. The information captured can be analyzed on a per-viewer basis, demographic basis or aggregate basis.

For transactional kiosks, which incorporate much of the same technology as digital signage, the remote locations of some kiosks
With cellular digital signage, brands can control their own programming, creating targeted dayparting and scheduling to their segmentation plan, generating a powerful opportunity.

have made it difficult to integrate them into a network. There may not be a network drop, and the logistics of running cabling, hubs and routers can nullify the possibility of an Ethernet or Wi-Fi connection. Cellular technology is changing that. Cellular broadband provides the maximum amount of flexibility without the bulky infrastructure. Now kiosks can be remotely managed no matter how far-flung the location.

Waiting rooms and break rooms

Waiting rooms and break rooms often are seen as the crown jewels of 3G/4G cellular-based digital signage locations. They have all the necessary requirements to ensure a captive audience. While customers are waiting, the deployer can engage them with relevant and entertaining content. And the deployer can relay critical news, required regulatory information or even employee training data to the private break rooms.

Waiting rooms in automobile repair shops, professional offices and other locations always have been a popular place to educate, inform and sell customers on new products and services. In the past, this was done through televisions that played ads stored on DVDs. The problem was that television screens simply aren’t built for that kind of wear and tear, and burnout and image retention soon became issues. It wasn’t long before they were replaced with flash-memory based display systems, but as those networks grew, it became difficult and costly to update or change the content.

Enter cellular-based digital signage. Digital displays have the longevity and durability to make this sort of continuous messaging and viewer relevance possible. It soon became clear that having that signage on a cellular network was the only practical means of deploying those displays. Adding digital signage to a pre-existing local area network, or LAN, wasn’t feasible due to security, firewalls and ongoing management and support issues. The separate and distinct nature of a cellular network served the needs of the real world.

Banks and financial institutions

Given the turmoil in the financial services industry, there is a critical need for relevant information at the branch level. In the midst of this shift, how can financial institutions, or FIs, keep their customers aligned and informed? Cellular-based digital signage networks facilitate context-relevant mes-
saging that can be delivered to the target audience at the location.

As with the healthcare segment, privacy also is highly regulated for banks and financial institutions. In addition, banks and credit unions often don’t have on-site IT professionals to manage and maintain a digital signage system. Firewall issues alone make it impossible to coexist without a separate network.

It’s not surprising that this industry is turning to cellular-based digital signage. Its cost-effectiveness, security and dependability are rapidly making cellular-based digital signage the preferred choice of banks and credit unions.

Cellular-based digital signage is a natural fit for the growing number of community-based and specialty narrowcasters that deploy in locations that are independently owned and operated.
The growing popularity of 4G cellular-based wireless broadband Internet connectivity promises to open a wealth of opportunities for the deployment of digital signage in new locations. The cost-effectiveness, security and dependability of 3G/4G mobile broadband are rapidly making cellular-based digital signage networks the preferred message-delivering solution for a variety of industries.

Every major carrier today is offering 4G cellular-based broadband services. Compared with the time, the costs and the issues associated with having to deploy cabling for a hard-wired digital signage network, cellular is the clear choice. The interactive capability of cellular-based signage promises to open up a wealth of new opportunities for businesses to serve their customers, including data gathering and videoconferencing.

And the control offered to businesses via cellular-based digital signage means the business operator can maintain complete control of content no matter how many signs are deployed or where they are located.

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