SMART + CONNECTED COMMUNITIES INSTITUTE

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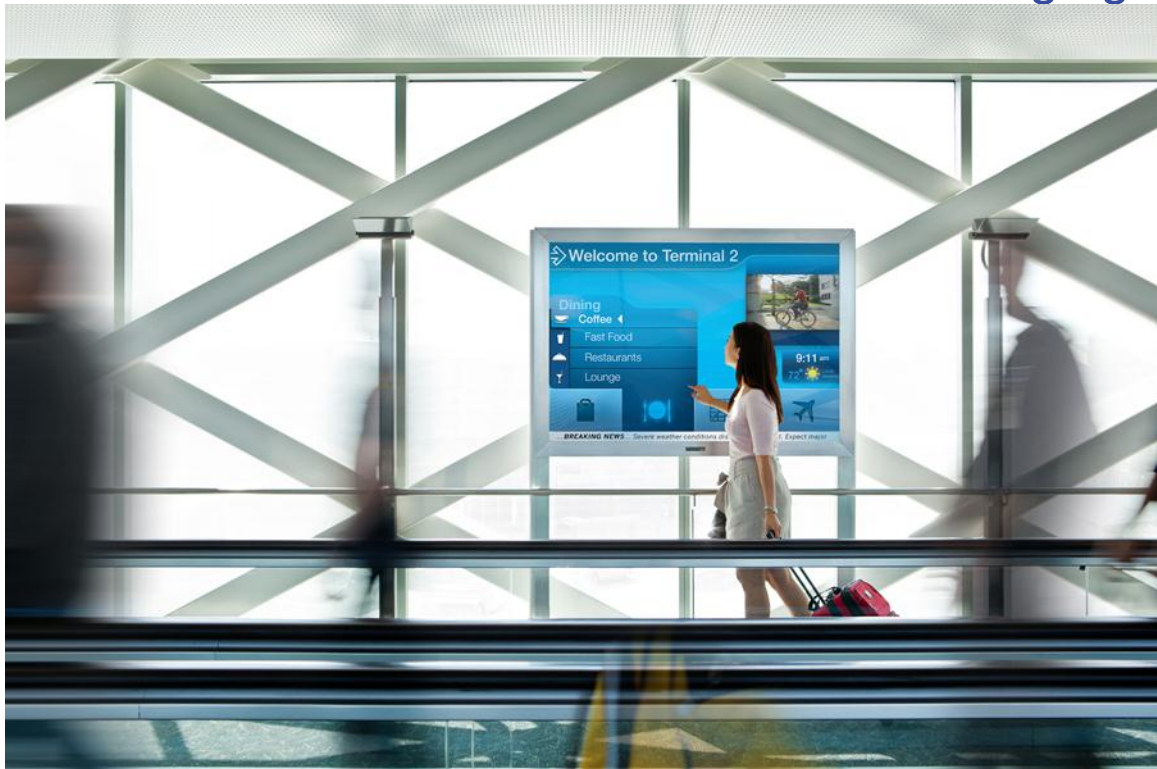Alexandra Holmes
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White Paper

Enabling the Next Generation of Enterprises with Smart+Connected Interactive Visual Messaging

Smart+Connected interactive visual messaging systems gather and share information across large and small screens and can enable creative application developers to rapidly build interactive systems that influence human behavior for a safer, greener, more efficient workplace. The convergence of video and information systems and the integrated development environment (IDE) in the digital signage and, more recently, handheld wireless markets, has narrowed. The technology gap between these otherwise expensive silos of proprietary systems is now turning into an open market that can rapidly integrate powerful, interactive four-screen experiences that have the power to change the world.

Proprietary digital signage solutions have introduced silos of information systems on the fourth screen (where television is the first screen, web is the second, and cell is the third). This had developers inventing interfaces and solving problems for each display size and content management system installation. Additionally, capturing display information with third-party systems was the responsibility of the end users, as the digital signage platforms had

limited connectivity out of the box. Needless to say, this left gaps between application development teams and end-user experiences on websites and cell phones. When will these worlds converge?

With Smart+Connected interactive visual messaging, that time is now. Today, we can take the focus away from the dilemma of how to build it on multiple screens and transfer our energy to the marketing magic of how all four screens can be used as one to improve the quality of our lives and make the world a safer, cleaner place to live.

Let's take a closer look at places where large groups of people meet on a regular basis, such as schools, office parks, airports, shopping malls, and government buildings and identify a few applications that can make a difference in how people choose to live, work, and play.

With Smart+Connected interactive visual messaging, we can build a network of displays— large, small, and wireless—where easy-to-create applications deliver live, streaming content, mixed media, display tickers, and flash content, using low-cost appliances that will improve building and workplace efficiencies, sustainability efforts, and life-safety capabilities on the same platform application that developers use today.

There are three areas that have been traditionally associated with proprietary digital signage content management platforms:

- Informational signage (figure 1)
- Green advisor
- Emergency notification

Figure 1 Example of informational signage displaying the floor plan of a hospital

Smart+Connected means that these applications can be created and made available for enterprises to manage and monetize on the Smart+Connected cloud with other enterprises in the Smart+Connected marketplace. Using IDE environments to create HTML 5-ready applications, combined with Content Delivery Network (CDN)-based media services, developers can create new real -time streaming solutions on interactive video messaging systems.

Informational Signage

Unlike traditional mediums of communication via flyers or emails, or intranet, an informational signage service allows dynamic content updates, both current and topical, that can draw captive eyeballs during coffee-breaks, in lobbies, and in the cafeteria. Informational signage will have the ability to provide rich media in public and private spaces for informational purposes or for revenue generation. It will also have ability to publish and sequence news items, corporate messaging, and information through a content management system on specific digital signs targeting specific groups. Informational signage can be used for something as generic as holiday announcements to more pointed communications found in integrated services. In a connected enterprise, displaying informational signage around break rooms and cafeterias can be a useful information dispersal mechanism, especially for corporate messaging, vision statements, corporate events, and financial updates (figure 2).
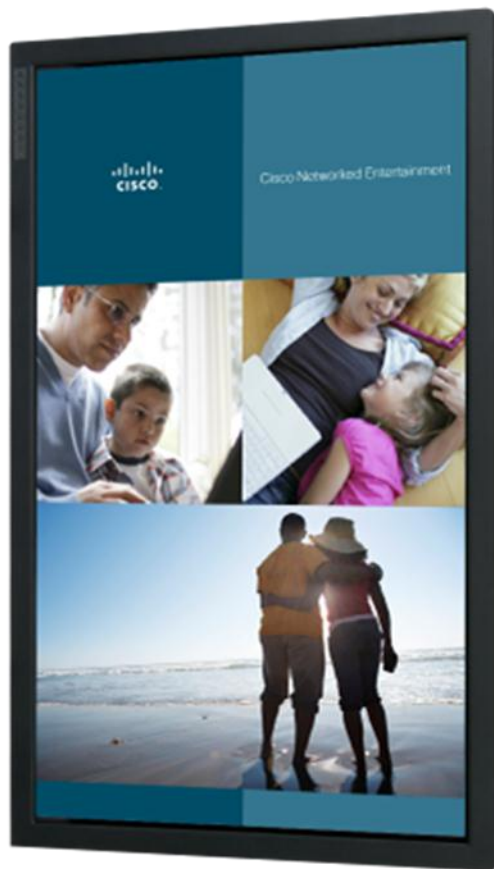
Figure 2 Informational signage within the Cisco workplace

An informational signage service uses centrally managed technology that broadcasts multiple media content about current topics, events, general news, and special bulletins, sequenced with other signage content. The large screens are made available across the enterprise campus, strategically located in lobbies (figure 3), corridors, hallways, break areas, cafeterias, parking areas, elevators, and other appropriate venues where employees and visitors are likely to congregate. Signage displays a visual map of the floor showing the reservation schedule for the day and a visual representation of meeting room availability. An informational signage service uses integrated

technologies in combination with new common-area digital signs to display relevant information related to the specific building and floor. In addition, common-area digital signage, through integration with scheduling and conference room IP telephony, can provide a way-finding capability that allows visitors to immediately identify available conference room space by:

- Importing and customizing building, floor, and zone plans through overlays by adding relevant information within the plans
- Sequencing and publishing floor plan information on specific digital signs
- Providing way-finding information from current signage locations to desired locations such meeting spaces, departments, break areas, and exits

Figure 3 Signage placed in a lobby

These new features are expected to improve building systems operations and create a more productive work environment. In addition, there is a reduction in overall real estate required and a direct reduction in management costs, both capital and operational, in conjunction with a higher utilization of IT assets. The informational signage service also uses digital signage to deliver information such as a building directory, way-finding, events, and welcome messages, along with art and entertainment news to building occupants and visitors. Way-finding helps people easily navigate to their desired location or to find an immediately available conference room. Way-finding (figure 4) leverages the information from the calendaring system to provide real-time room availability and

scheduling information. Way-finding uses common-area digital signs to display conference room availability and uses scheduling information to provide conference room availability information. In addition, visitor signage outside of conference rooms informs employees of useful details such as room availability, nearby meeting rooms and their locations, and internal and external temperatures. Visitors can also use an IP phone to select from a menu of messages to be displayed outside of a conference room. These messages alert users to a known scheduling conflict or other matter pertaining to the availability or function of the room.
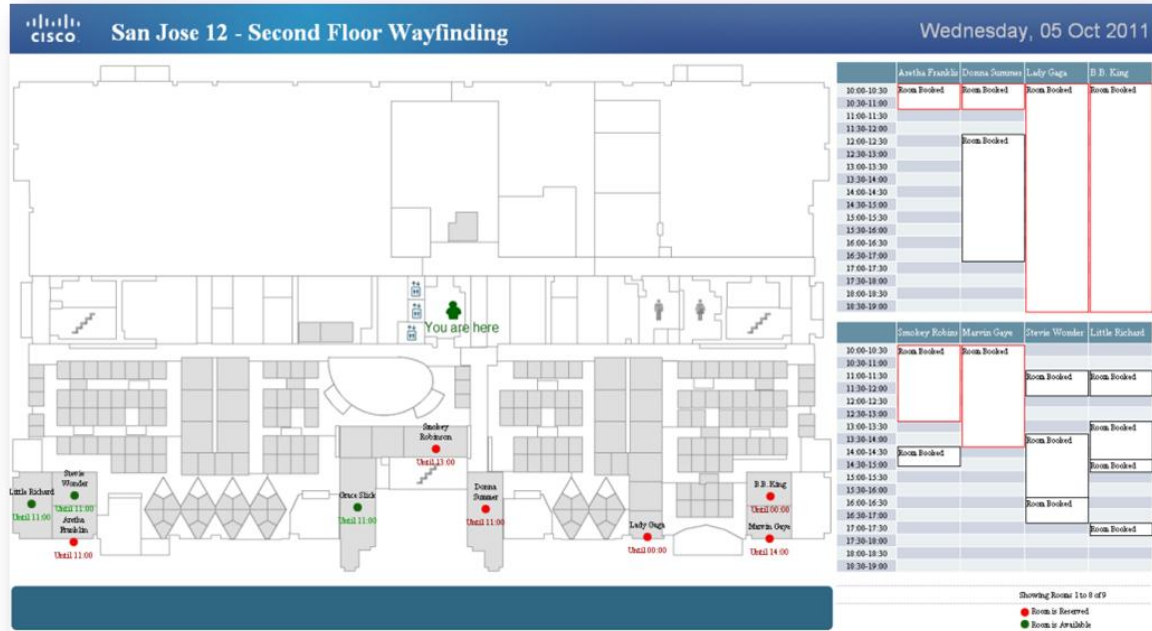

Figure 4 Way-finding

Green Advisor

Using existing infrastructure, a green advisor gathers, analyzes, and displays real-time building energy usage, such as utility and resource consumption, and influences change in user behavior through education, providing information about global and local sustainability efforts. This service contributes to energy savings by linking energy consumption to forecasted and current occupancy of workspaces. A green advisor (figure 5) uses common-area digital signs to display targeted messages to specific locations at specific times related to compelling building sustainability information such as energy usage, the carbon output for the building, and green tips and trivia. A green advisor aggregates and shares building and space energy consumption to help raise awareness and promote conservation within the building.

Figure 5 Cisco Green Aware

A green advisor is scalable, centrally managed, and allows for the publishing of live content to both on-premise and outdoor digital signage displays. In most cases, the addition of the green advisor to the data network is owned and controlled by building operators with support from IT and enables:

1. Data collection and aggregation

    a. Provide source information pertaining to energy consumption from underlying devices such as HVAC, lights, and so on from various energy-consuming points

    b. Integrate with building management systems and energy and utility meters through mediation devices

    c. Provide usage data and calculate savings both in terms of energy and carbon emissions

2. Utility consumption and trending

    a. Track consumption across locations and time periods

    b. Display trending information on digital signage in an easily consumable manner as defined by the administrator

3. Comparison of consumption information

    a. Compare consumption data across locations and time periods

    b. Display comparison information on digital signage as defined by the administrator

4. Green tips and awareness

    a. Administrators can create green tips and awareness information through a content-management interface

    b. Administrators can source public and authenticated feeds for tips and awareness

c.   Display green tips and awareness information on digital signage as defined by the administrator

A green advisor displays anecdotal information regarding global and local sustainability efforts. Given that employees gather throughout the workday in break areas for tea and snacks, it has been determined that this is a good location to display employee information on digital signs. It is on this network that the green advisor will periodically display its content. For example, when employees catch a quick break for afternoon tea, they are able to capture the content being displayed by the green advisor. What they learn is that buildings alone expend a large percentage of greenhouse gas emissions compared to the transportation and manufacturing industries. With this interesting fact, they pay close attention to the live data, which illustrates that building is consuming 35 percent less energy than the building they previously occupied. As they continue to read the screen, they pick up a few tips as to how they can help improve this number even more.

 The green advisor solution can also help employees see the impact they are making through any localized conservation efforts (figure 6). Signage can display information on campus energy usage, energy-saving programs, useful energy conservation techniques specific to the area in which the sign resides, and so on. This can be applied at any level in the location hierarchy, not just a floor. These useful tips help users understand their individual contribution to operational expenses as well as the organization's environmental impact. The intention is to drive a change in user behavior through education in utility and resource consumption.

Figure 6 Signage displaying local sustainability efforts

Emergency Notification

An emergency notification service enables security and facility administrators to monitor all physical aspects of the building from multiple centralized or remote locations, and can be integrated into the display design to help better protect and prepare employees. The service enables the immediate display of emergency information, such as

evacuation plans and severe weather alerts, using digital signage and IP phone displays as the media for notification (figure 7). This is complementary to the fire alarm system and public address system, and will leverage the existing infrastructure to communicate to employees and occupants with consistent messaging over VoIP phones and digital signs.
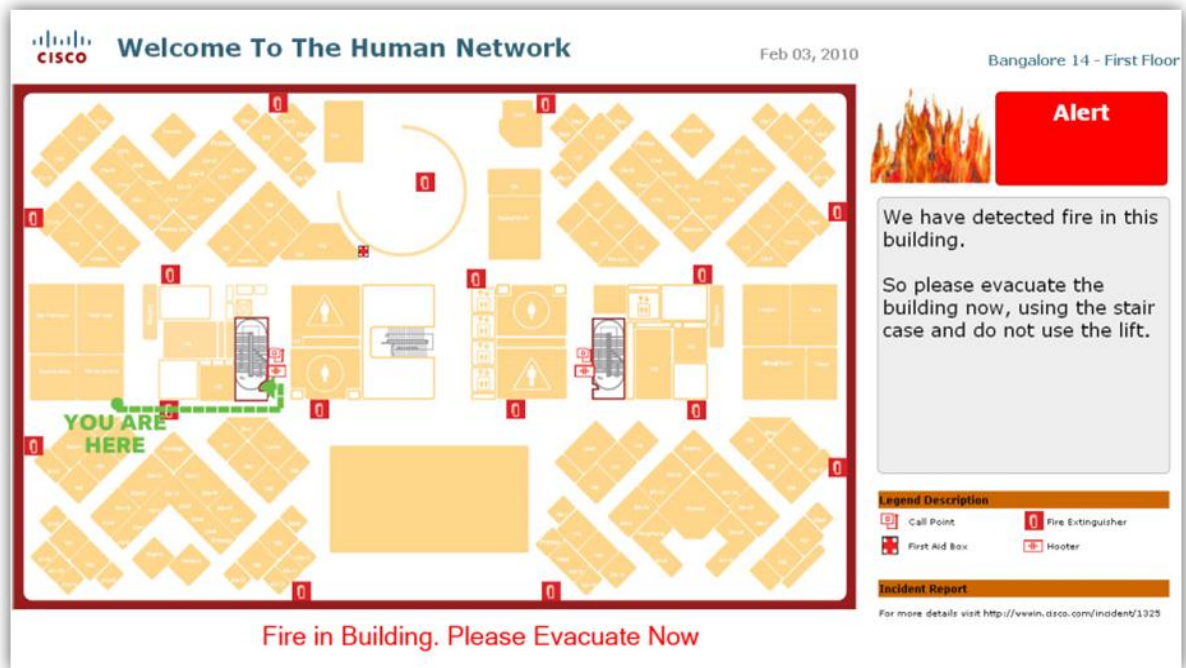

Figure 7 Emergency notifications

In case of an emergency, this solution uses digital signage displays and IP phones as the medium of notification. It can also:

- Integrate with physical safety and security systems
- Override controls into the digital signage system and IP phone displays
- Display evacuation plans , weather alerts, and fire exits in a building on digital signs and IP phones
- Provide role-based access to define the appropriate messages and enable emergency notification to be turned on or off
- Provide the ability to view, edit, and modify the status of an emergency message
- Provide the ability to set a broadcast notification of an emergency message
- Have predefined templates for possible calamities such as fire, flood, gas leak, traffic accident, social unrest, and terrorist attacks
- Stream live video feed from affected areas, or other video, to the digital panels to assist in analysis and relief planning
- Supplement the fire alarms and public address system by sending out consistent messaging (alerts and notifications) on IP phones and digital signage installed throughout the enterprise

- Display information during a crisis or emergency by allowing an administrator to broadcast emergency alerts and notifications (for example, exit plans and safety information) to specific locations on digital signage and IP phones, or send targeted notifications to locations depending on the severity of the emergency in a given location

- Display information during stable periods by allowing an administrator to display emergency exit plans and safety information on digital signage and customize the floor plans with necessary information (for example, emergency exits, medical kits, and fire extinguishers) through appropriate overlays

An emergency notification service has the ability to activate emergency notification content on the signage. The content shown can include a note on the nature of the alarm and an emergency exit plan showing floor plan and routes specific to the floor on which the particular sign resides. For example, if a state of emergency is declared for the city, corporate communications immediately determines how they want to inform employees of the situation and the subsequent steps. A proper message is transcribed and sent to IT for high-priority disbursement on an emergency response notification system. The message from corporate communications is loaded into a predesigned HTML template. This message is then directed to the digital signage and the integrated IP phone application, taking priority over any existing content on all digital displays in the building. An emergency notification service quickly sends out emergency notifications and instructions as appropriate for the situation and location. Using common-area digital signs, security teams are able to quickly display emergency notifications for a given floor, such as evacuation routes, shelter-in-place, and emergency instructions as appropriate for the situation. Based on the local individual emergency or safety-related situation, relevant emergency and safety announcements are pushed to the local common-area digital signs. This feature enhances current safety efforts and is in addition to any and all standard notification systems required by law.

Conclusion

Smart+Connected digital signage is a new opportunity to implement new, cutting-edge, integrated technologies that will improve building and workplace efficiencies, sustainability efforts, and safety capabilities. A Smart+Connected digital signage solution makes use of the digital signage framework to more easily aggregate and share building and space energy consumption. Such a solution leverages the network and the service delivery platform. With the new building systems' design and infrastructure, more monitoring and interoperable control capabilities will be provided. This information is pushed to local digital signs to help raise awareness and promote conservation around energy use in the building. A Smart+Connected digital signage solution will deliver these capabilities on a platform to increase the use of green technology in the future.

About the Authors

Ken Borruso is the CTO of www.visualincite.tv, a provider of multimedia content management fan enhancement experiences, integrating applications on mobile, TV and LED systems for the PGA. He served as COO and turn-around champion for Horizon-Engineering and was Director of IT for Merial. He was also Director of Sales Engineering and Product Manager of a VoIP CLEC, global telecommunications technical marketing specialist, and network management sales engineer for AT&T. He is the recipient of notable industry awards and a patent for the design and implementation of new products, services, and operating procedures. Borruso is a national speaker on change management at peci.org/ncbc and a recognized team leader for business integration and operation readiness testing. He is a published contributing writer for Digital Signage Today e-magazine (*Targeting 21st century consumers*. Digital Signage Today. September 4, 2008. www.digitalsignagetoday.com/article/163078/Targeting-21st-century-consumers-Part-1) and is republished in other white papers. Borruso received his master's degree from Polytechnic University in information systems engineering.

Vito Amato is a Customer Solutions Manager in the Emerging Solutions Group at Cisco and specializes in interactive media solutions that enable Smart+Connected Communities, virtual learning environments, social collaboration, and interactive video. Amato joined Cisco in September 1999 to manage curriculum development for the Cisco Networking Academy Program. He then moved on to the Cisco Media Network within the Internet Learning Solutions Group, where he was the Content Development Manager. Subsequent roles have included E-Learning Technologies Manager and Business and IT Analyst in Information Technology and Education Solutions Manager in Education Marketing. Amato then managed systems and content for the Cisco Entrepreneur Institute and Emerging Markets Virtual Theatre. Prior to joining Cisco, he was the Chief Information Officer at the Arizona Department of Education and a faculty member at Arizona State University. He earned his Ph.D. from Arizona State University specializing in educational and interactive media and his master's degree in instructional technology and media from the California State University at Los Angeles.

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Sekhar Kondepudi recently joined the National University of Singapore as a faculty member of the Department of Buildings in the School of Design and Environment focused on Smart Buildings, Energy, Sustainability, and Smart Cities. Prior to his appointment at the National University of Singapore, he led Global Product Management and Business Development for Smart+Connected Communities (S+CC) Products and Solutions at Cisco. He has more than 20 years of global and broad-based experience, including academia, applied research and strategic planning, product management, business development, and strategic sales in multiple industry vertical markets such as energy, buildings, utilities, networking, voice, semiconductors, health care, and public safety. Kondepudi has worked for both start-up and Fortune 100 companies around the world in North America, Latin America, Western Europe, India, China, Japan, Southeast Asia, and Africa. He received his Ph.D. in mechanical engineering from Texas A&M University.