

VISUAL SOLUTIONS: SEEING IS ACHIEVING

Staying on the cutting edge of visual technology helps your organization stand out in today's bustling environment.

Executive Summary

Staying connected with customers, clients and constituents can be a challenge without the proper tools. Whether communicating long-distance, in person, one on one or one to many, multimedia support can make or break your connection. In fact, it could be considered essential.

Today, the adoption and extension of visual solutions can help the enterprise improve its performance, reap the potential value of its resources and build its brand and reputation. These solutions include digital signage, streaming media, high-impact audio/video (A/V) presentation and video conferencing.

Before an organization can embrace next-generation visual technologies to further its strategic goals, it must understand the following:

- Primary motivating factors in the broad adoption of visual solutions
- Key issues to consider when deploying new visual technologies
- The need for leading partners that are capable of supporting the organization's move to better visual communication

In short, leaders must make informed decisions about how their organizations can leverage technology in order to achieve their goals with maximum efficiency and minimal risk.

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Why Visual Solutions?

Over the past decade, organizations have made significant investments in communication technology. These investments have included sophisticated telephone and e-mail systems, complex websites, remote and mobile computing and a range of collaboration tools. Although these investments have been worthwhile, they are no longer sufficient to keep pace with changes taking place in business, society and the world in general.

Because human communication is inherently and profoundly visual, text and voice can go only so far in conveying meaning – they do not hold people's attention the way visual images can. If the enterprise wants to communicate more effectively with employees, customers and other constituencies, they have to adopt visual technologies.

For this reason, many organizations are aggressively adopting high-value visual-technology solutions including:

- **Digital signage:** Retailers have discovered that in-store displays can double impulse purchases. Programmable billboards and traffic signs now inform us of everything from the performer headlining at a local venue to alternate routes we should consider due to an accident up ahead. An explosion in digital signage demonstrates that organizations of all kinds can use the power of enhanced visual communications to their advantage.
- **Streaming video:** Viral videos show just how visual our culture is. In fact, search engines now make streaming media a heavily weighted factor in website rankings. Organizations that neglect streaming video will miss out on both an effective means of communication and an important tool for driving website traffic.
- **Audio/Video Presentation:** Conventional Microsoft PowerPoint presentations may have been good enough 10 years ago, but today, in order to engage audiences of all types, professionals need high-end multimedia A/V presentations that deliver an organization's message or brand with impact. That means stepping up the ability to both produce compelling presentations and deliver them wherever they need to be delivered.
- **Video conferencing:** Once the exclusive domain of executives at large corporations, video conferencing is now a pervasive medium for everyday workplace communication. In most PCs, notebooks and tablets, video cameras are standard. And the enterprise is gaining considerable benefits from their use – including reduced travel costs, cohesiveness of geographically dispersed teams, and the ability to provide better support to flex-time and home-based teleworkers.

No organization can afford to remain complacent about its use of visual technologies in a marketplace in which high-

impact multimedia is becoming commonplace. That's why it's important to evaluate the broad range of solutions available for visual communications and decide which to invest in.

Digital Signage: Actionable Information on Display

With all the attention focused on the web the past few years, it's easy to lose sight of how effectively technology can be applied in the bricks-and-mortar world. Digital signage provides ample evidence that technology can do a lot more than just deliver information to desktop browsers and smartphones. It can also deliver the right message at the right time in stores, offices and public spaces.

We've all had experience with various kinds of digital signage. Just watching how intently people scan the arrival and departure displays at any airport offers testament to how powerful digital signage can be. Drive by any modern movie theater and notice the same thing. The ability to dynamically update an electronic display with compelling, informative content is a powerful way to inform, motivate and direct buyers.

Digital signage is especially compelling compared with conventional displays, printed posters or hand-written signs. These require lengthy lead times, as well as manual labor in distributing, hanging and taking down signage.

Many organizations have even found that they can turn digital signage into a new revenue stream. This is done by charging advertisers or other parties for time slots on their electronic displays.

Digital signage can also incorporate touch-screen technology into specialized display devices to create an engaging interactive experience. In shopping malls, for instance, shoppers can navigate touch-screen displays for wayfinding purposes in locating stores or learning which stores carry certain items.

Because every organization is different, digital-signage needs will differ as well. It is important to select the right components for a signage system and put them together in the right configuration. These components include:

The content management system: At the head of any digital-signage implementation is the system by which display content is managed. This can range from ad hoc updates of simple text to complex, scheduled rotations of rich video and audio content. The most important consideration for these systems is that they provide the required management functionality via a reasonably intuitive user interface.

Digital display devices: At the delivery end of any digital-signage implementation are the displays themselves. These can vary substantially in size, image quality, cost and useful life span.

Plasma screens, for example, offer excellent image quality, as well as the ability to view images from a range of angles. Plasma's strong contrast and rich color saturation make it particularly appropriate for spaces with a lot of ambient light, such as storefronts. LCDs, on the other hand, may not offer as broad a viewing angle as plasma screens, but they consume less energy and can last twice as long.

By using multiple, modular, thin-bezeled displays, coordinated through a matrix controller, digital-signage professionals can even build entire video walls that can – in combination with a high-quality speaker system – dramatically transform an otherwise static space into a dynamic, immersive experience of sound and light.

Media players: To display multimedia content, a digital-signage implementation usually requires one or more devices to play the content – sort of a mini computer dedicated to audio and video playback. These are often Windows-based systems with sufficient storage capacity and processor speed to handle large multimedia files. They can be hung behind the displays or housed in an equipment closet and attached to the displays via wired or wireless networks.

The choice of media player will depend on the type of content displayed, as well as the size and number of different content packages that must be stored for possible future display needs. Some of today's more advanced media players are fanless (therefore, quiet) and use solid-state storage (with fewer moving parts that could fail).

Digital Signage Drives Home the Message

Brand Awareness – Provides 47.7 percent effectiveness increase

Average Purchase – Increases amount by 29.5 percent

Repeat Buyers – Generates 32.8 percent growth

In-store Traffic – Generates 32.8 percent more

Time in Store – Generates 30 percent more

Source: InfoTrends, 2011

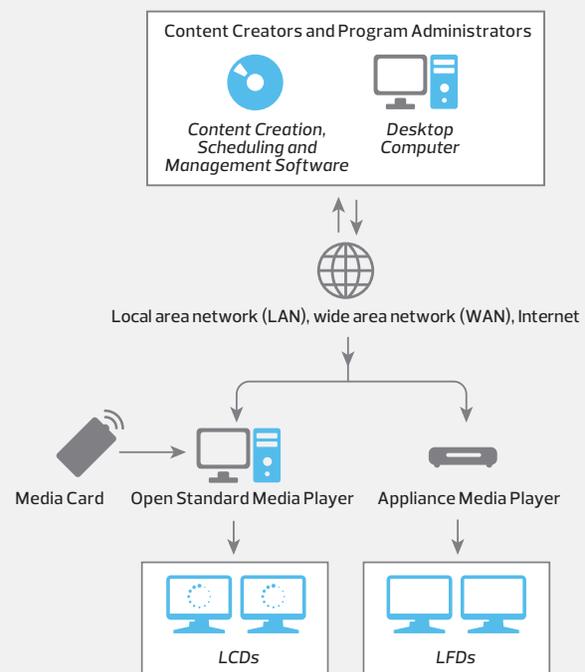
Signage connectivity: Depending on the nature of the implementation, it is also important to properly design and install an infrastructure that will distribute content to the various digital-display devices. In addition to typical network cabling and switching, it may be necessary to use extenders and splitters to maintain signal quality and distribute images to multiple screens. These considerations become even more critical for implementations where there are significant distances between displays or where signage in multiple locations must be managed centrally.

The components outlined are available from a variety of top-tier vendors. These vendors also offer a selection of other components for building a complete digital-signage network, ranging from the basic hardware for mounting digital displays, to sophisticated signal management solutions that allow images on multiple screens to be coordinated with a high degree of precision.

Of course, there's one more component that's essential for any successful digital-signage implementation: imagination. Someone has to look at a space where there is no digital signage today and imagine how digital signage could enhance it with eye-catching, real-time communications.

Vendors can supply some of this, too, through consulting services or creative templates. But ultimately, it takes a leader with vision inside an organization to imagine how digital signage can help accomplish objectives – and then champion that idea from conception to implementation.

Delivering Digital Signage Requires a Number of Components



Streaming Media: Richer Online Engagement

For years, organizations could use the web only to share text, data and static graphics. There were several reasons for this.

- Users had relatively limited Internet connections, so it was impractical for organizations to push bandwidth-hungry video and audio content.
- The capacity and sophistication of switching across the complex network fabric of the Internet also had not reached

the point where smooth, continuous media streams could be delivered reliably from servers at one place in the world to endpoints anywhere else.

- The speed and sophistication of media servers was also relatively limited, and standards for compressing and decompressing media streams had not matured.

As a result, the online video experience left a lot to be desired. Users had to either download massive video files in their entirety and then view them locally, or endure the constant stopping and starting of whatever they were listening to or watching. They also had to download special software media players every time they tried to use a new media source.

Of course, times have changed. With the advent of high-speed Internet access, advanced switching at the Internet's core and edge, more powerful media servers, and broadly accepted streaming standards, streaming media – that is, the continuous, real-time delivery of audio and video content to end-user devices – has become one of the biggest contributors to Internet data traffic. From video-sharing and on-demand movies to online training and sporting events, Internet users now consume streaming video as readily as they watch their TVs.

Organizations of all kinds are taking advantage of this streaming media revolution, in many ways. Some common, high-ROI uses of streaming media include:

- **Sales and marketing content:** There's a reason why companies spend so much money on television commercials: They work. Visual storytelling is a great way to present a value proposition or motivate a purchase. Plus, when companies post videos on their websites, they aren't restricted to a 30-second format. They can also update their streaming content to keep it current or capitalize on market opportunities.
- **Customer support:** If a picture is worth a thousand words, how much is a video worth? It can be worth tens of thousands of dollars – especially if companies use it to show customers how to do something that their customer service reps would otherwise spend time explaining to them over the phone. Many organizations have found that they can dramatically reduce call center costs by providing brief, simple instructional videos that address common support issues, such as product assembly or part replacement.
- **On-demand training:** Organizations often have to make sure that employees, dealers and other people both inside and outside the enterprise are up to speed on sales techniques, compliance policies or other issues. Streaming video offers a cost-effective way to deliver this training to people at a time and place of their choosing. With the right software, organizations can also verify that users have, in fact, viewed the videos so that they can document fulfillment

of compliance requirements or remind those who have not yet viewed important content. For educational institutions, instruction delivered over streaming media represents an entirely new set of distance learning opportunities.

- **Testimonials and case studies:** It's one thing for potential buyers to read about the successes of an organization's existing customers; it's another for them to hear and see those customers talk about the organization's products or services in their own words. With streaming video, companies can create compelling, high-credibility testimonials to help stimulate interest and close deals.

Video Rules

- Internet video is now 40 percent of consumer Internet traffic, and will reach 62 percent by the end of 2015.
- Video-on-demand traffic will triple by 2015.
- Global Internet video traffic surpassed global peer-to-peer (P2P) traffic in 2010, and by 2012 Internet video will account for over 50 percent of consumer Internet traffic.
- It would take over 5 years to watch the amount of video that will cross global IP networks every second in 2015.

Source: Cisco Visual Networking Index

And these are just some of the ways that streaming media can deliver value. It's also worth noting that search engines increasingly use the presence of streaming media to rank websites, so including video clips on a site can help boost site traffic, which in turn can lead to more sales and long-term customers.

The implementation of streaming media requires multiple technologies tailored to an organization's specific objectives and requirements. These include:

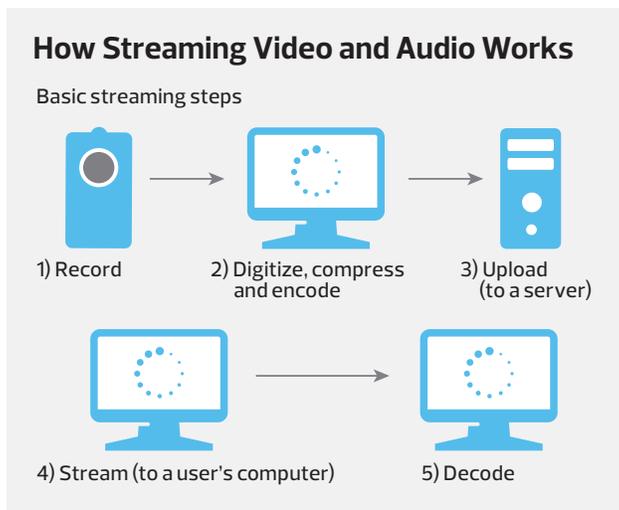
Video capture: The number and type of cameras an organization needs will depend on its streaming objectives. Will the content be exclusively a single speaker in a single location? Will capture have to take place under a variety of indoor and outdoor lighting conditions? Is the content primarily intended to be viewed live, or will it undergo sophisticated editing? Does the video stream need to be a certain resolution? The answers to these and other questions will help ensure selection of the right capture device at the right price.

Production and editing: Organizations will have dramatically different requirements when it comes to converting raw video footage into streaming media content that can be delivered effectively over the Internet and other private network connections. Some may need only basic capabilities for editing footage and adding a few simple titles. Others will want to combine live footage with animated charts and graphics, as well as video captured from other sources, such as news and entertainment programs.

Production needs will also be driven by how the content will ultimately be consumed. Video that will be viewed exclusively on a website in a browser, for example, will have different production requirements from video that will be played on a video wall in a retail setting.

Servers and networking: The editing and delivery of streaming digital video represents a very different workload from traditional data applications, so any IT shop contemplating its use should plan on acquiring servers with processors specifically designed for high-performance tasks.

Network infrastructure may also have to be upgraded to ensure hiccup-free delivery of video streams. In addition, because video workloads tend to be very erratic, it's a good idea to leverage virtualization in order to make good use of server processor capacity when it's not being used for media workloads.



Audio/Video Presentation: Taking Meetings to the Next Level

Organizations are constantly holding events – in business, perhaps a customer presentation or product launch; on campus, a curriculum planning session or an assembly; in government, a public hearing or training program. Such events can have a substantial impact on the future of an organization. Otherwise, what would be the point of having them?

But people who attend such events have expectations, usually set by glitzy audiovisual experiences they've had elsewhere, such as at sporting events, concerts or even their home theaters. Therefore, it's good strategy to improve the quality and impact of in-person events through better A/V technology.

Doing so will hold people's attention and ensure that the organization's message is heard. It can also leave a much more favorable impression of the enterprise and its brand.

An effective A/V implementation, however, requires a variety of specialized skills and equipment. Following are some of the factors to consider:

Facility design and layout: Before specifying and installing the A/V components themselves, it is essential to evaluate the physical characteristics of the facility where they will be installed. The shape of the room, for example, will determine the size, placement and number of display components and speakers necessary to ensure an optimal experience.

The acoustic properties of the room must also be taken into consideration. Are there mechanical systems nearby, such as heating, ventilation and air conditioning (HVAC) systems that might affect sound quality? Are there large windows that might affect the visibility of projected images?

Sound system: Everyone knows how annoying and distracting imperfect sound can be. That's why sound systems have to be adjusted properly and include the right technology to eliminate feedback and echo. Quality bass/treble balance is important for ensuring that all presenters can be fully understood, even if they're not professional speakers or if they speak with an accent. The proper complement of microphones is also necessary to ensure that the facility can support all types of presentations, including panel discussions and those that require interaction with the audience.

Video system: A variety of factors influence the selection of display technologies for A/V systems, including the choice of projection technology; screen type and size; brightness; mounting and tiling capabilities; and input options. The input options – and the technology necessary for seamlessly switching among them – are especially important for supporting meetings where display content may include live presenters captured with a camera; digital content generated by a local computer and/or files from networked storage; live video feeds from a teleconferencing system; and playback of video streams captured from a DVR. When choosing the type and number of video displays, it is important to consider an audience's viewpoint throughout the room to ensure that every seat offers the ability to see or read what's on a screen.

Ancillary capabilities: Organizations can enhance their meeting facilities with a variety of other capabilities, including video and/or audio conferencing for linking multiple sites, video and audio capture to provide post-event replay capabilities, whiteboards for generating graphics in real time, and audience input devices for real-time polling.

Finally, all the A/V components must be properly installed and tested to ensure smooth functioning under all conditions. This includes ensuring that wireless microphones function without feedback or interference from all points in the room, and stress-testing display components with high-intensity HD content.

IPTV and VOD

Consumers have a seemingly insatiable appetite for entertainment. So, as video, voice and data converge on IP networks, new opportunities arise for delivering that entertainment.

Internet Protocol Television (IPTV) and video on demand (VOD) technology can provide video programming over an IP network infrastructure. IPTV is an emerging set of standards for securely and reliably delivering multimedia services that include graphics and data, as well as video and audio, over an IP network. VOD complements IPTV with a set of interactive capabilities that let users browse programming menus, view clips and select content for immediate personal viewing.

Although IPTV and VOD are primarily of interest to telecom, cable and Internet entertainment companies, they are starting to appear in other markets, such as hotels and resorts, where they can generate additional revenue streams while providing competitive differentiation.

Operators must also be properly trained to use mixing and input control panels to ensure they are able to handle all types of live events. Many people assume that internal IT staff can handle A/V equipment simply because it's technology. But A/V technology requires a very distinct skillset, so having an appropriately trained operator on hand is critical for consistent and reliable event success.

Trusted IT vendors and suppliers can often provide expertise in this area, offering fully integrated A/V systems, consultation and support. This includes help with presentation facility needs, delivering high-quality content for meetings or even establishing A/V systems in remote offices.

Video Conferencing: Eliminating Distance

The nature of work has changed dramatically in recent years. Work is increasingly knowledge-focused, requiring people to collaborate and exchange information. This knowledge has to be shared quickly and accurately so that organizations can develop the right products and bring them to market ahead of the competition.

Organizations are changing as well. For one thing, they tend to be more geographically dispersed than ever. For another, they increasingly depend on loose, ever-changing networks of partners, contractors and other third parties. This means that people have to work with colleagues who are in another city,

another state, or even another country, instead of just down the hall.

Voice- and text-based communications, however, are not sufficient to ensure that these geographically dispersed teams collaborate effectively. As much as 93 percent of the meaning that human beings derive from their interactions with each other comes from nonverbal cues such as facial expressions, hand gestures and body language.

These cues are not only important for collaboration among team members, they are also useful in negotiating with constituents, customers and suppliers because they allow professionals to pick up on nuances of the other person's psychological state. They are also essential in other situations in which it is crucial to quickly develop a good understanding of the other person; for instance, when interviewing prospective employees and contractors. And what better way to allude to a product, contract or other physical object than to hold it up for people to see over the miles that otherwise separate one another?

Historically, this kind of face-to-face communication was only possible in person. With the continued evolution of video conferencing, however, organizations can now enable people to see and hear each other without requiring them to be in the same physical location. This can result in a wide range of compelling benefits, including:

- **Improved processes:** When people can see each other, they communicate more clearly. This results in better collaboration, fewer mistakes, faster project completion and smarter decisions.
- **Improved productivity:** With video conferencing, people don't have to leave their offices or hop on a plane to attend necessary meetings. They can spend more time working productively and less time on the road.

Along with reduced travel costs, organizations see these as other aspects of video conference ROI:

- Dollars saved from reduced meeting time
- Dollars saved from reduced downtime (or, "windshield time")
- Dollars saved from faster time to market
- Dollars saved from reduced employee turnover
- Employee productivity
- Customer satisfaction
- Employee satisfaction
- Supplier relationships

Source: *Video Conferencing Straw Poll Report*, CDW, 2011

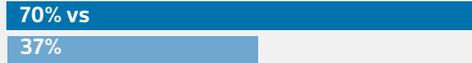
The Great Divide: Global Survey on Adoption of Video Collaboration Tools

Seeing is believing: Users rank qualitative and quantitative benefits higher than non-users, such as:

Saving money



Improving work-life balance



Increasing competitive advantage



Bringing people closer together



Frequent video conferencing and telepresence users report saving at least two hours weekly, with one third reporting at least one day saved per week.

Source: Cisco Systems, 2011

- Reduced travel expenses:** Many organizations spend a significant amount of money on airfare, rental cars, hotels and other travel expenses. Video conferencing significantly reduces these costs.
- Reduced carbon footprint:** Video conferencing can play a central role in green initiatives as organizations become more environmentally conscious. Reductions in an organization's carbon footprint can be quantified by comparing travel activity year over year.
- Broader global reach:** In today's global markets, the ability to overcome geographical limitations can be a key to success. Video conferencing eliminates many of the barriers that prevent organizations from selling, serving, hiring and contracting anywhere in the world.

For these reasons and more, organizations of all kinds are rapidly embracing the new generation of video conferencing solutions.

Video conferencing is not a single, monolithic technology. Instead, it is a diverse set of technologies that can be applied as appropriate to bring visual communications to different areas of the organization, based on cost and quality requirements.

Generally speaking, video conferencing solutions can be divided into four main categories:

Desktop – This offers video conferencing at its most basic level. With no more than a computer equipped with a webcam and the appropriate software, users can conduct low-cost, face-to-face meetings directly from their desks. Desktop video conferencing is commonly used in telecommuting. Other UC tools, such as VoIP and web conferencing, can easily be used in conjunction with desktop video conferencing.

Executive (Business-Grade) Desktop – This consists of a self-contained video conferencing unit offering high definition video, expanded multipoint capabilities and low total cost of ownership (TCO).

Multisite Meeting Room – Room-based video conferencing systems deliver higher video and audio quality through the use of specialized equipment, including higher-resolution cameras, microphones equipped with echo cancellation, high-fidelity speakers and high-resolution monitors. These technologies are professionally installed in a properly designed conference room. Room-based systems may also offer additional functionality, such as white-boarding and picture-in-picture presentation mode.

Room-based video conferencing requires greater investment than desktop video conferencing, but it offers a better experience for executive-to-executive sales presentations and group-to-group project reviews.

Immersive Telepresence – At the highest end of the video conferencing spectrum are telepresence systems, which use a variety of techniques to give participants in different locations the sense that they are actually in the same room with each other. This is accomplished by precisely calibrating the lighting and positions of the monitors and cameras at each location – and by displaying images of participants in life-sized high definition – so that the images closely resemble what a real person would look like sitting in the room. These sophisticated implementations are most appropriate in situations where geographically dispersed members of an organization meet frequently and must maintain close working relationships over an extended period of time.

In addition to requiring the right audio and video equipment, the successful adoption of video conferencing may also require modifications to the network. Video streams are highly sensitive to network traffic glitches such as jitter and lag, and people find even minor flickers in video images disturbing. So it's important to test and, if necessary, appropriately modify the network to ensure that video conferencing traffic moves smoothly and reliably between network endpoints, using quality of service technology and other standards or network design considerations.

CDW: A Visual Solutions Partner that Gets IT

Visual solutions – including digital signage, A/V technology and video conferencing – clearly play a role in improving performance and productivity. But few organizations have the in-house expertise necessary to quickly and accurately design, implement and support these solutions.

CDW offers a one-stop shop for integrated solutions via partnerships with leading visual solutions vendors including Black Box Network Services, Cisco, Crestron Electronics, LifeSize Communications, LG Electronics, NEC, Polycom, Samsung, Sony, ViewSonic and others. And we deliver much more than just products. Our comprehensive approach enables the enterprise to reap the benefits of the best technology, expertise and ongoing support services.

CDW has taken the guesswork out of buying A/V systems by pretesting best-of-breed solutions to match any budget. Our solutions include the most commonly deployed products on the market and accommodate a wide range of technical requirements and budget constraints.

Your dedicated CDW account manager and solution architects are ready to assist with every phase of choosing and leveraging the right video solution for your IT environment. Our approach includes:

- An initial discovery session to understand your goals, requirements and budget
- An assessment review of your existing environment and definition of project requirements
- Detailed manufacturer evaluations, recommendations, future environment design and proof of concept
- Procurement, configuration and deployment of the final solution
- Telephone support as well as ongoing product lifecycle support

To learn more about CDW's visual solutions, contact your CDW account manager, call 800.800.4239, or visit CDW.com/conferencing or CDW.com/digitalsignage



NEC Display Solutions is an industry leader in digital signage and provides expertise in creating customized display solutions. With an array of large-screen displays to fit almost any business application, we can fulfill any digital signage need. NEC specializes in a variety of industries, including corporate lobbies and wayfinding displays. NEC works as a general contractor by connecting clients with its Display Solutions Partners to help create the perfect fit for each application.

CDW.com/nec



Ergotron expanded its digital signage portfolio to cover your signage needs from ceiling to floor and everything in between. Choose from a broad but simple selection of tilting, fixed, cantilevers, ceiling mounts or mobile carts that ensure you will meet most, if not all, of your deployment needs. Ergotron's innovative line of display mounts and mobility products move the content to the audience so it is easily viewed. Ergotron – positioning the display to make the most powerful impact.

CDW.com/ergotron



With a comprehensive selection of digital signage and video distribution solutions, Black Box enables companies of all sizes to affordably implement effective internal and external visual communications. In addition to its iCOMPEL™ and MediaFlyer™ EXPRESS platforms for digital signage, it offers extenders, splitters, switches and converters, as well as cabling, mounts, enclosures and more. It also provides wireless solutions for presentation sharing in conference rooms.

CDW.com/blackbox



Elo TouchSystems, a pioneer in touch technology, manufactures a complete line of touch solutions that simply interface between people and computers. Our solutions are designed for the demanding requirements of diverse markets and applications across the globe. We currently offer multiple touch technologies in a wide variety of desktop display, open-frame, interactive digital signage, and all-in-one touch computer products.

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