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Technology Report

Video Surveillance: Lessons from the Education Market

Education at a Glance

About the author

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Video Surveillance: Lessons from the Education Market

The importance of physical security systems in the education market is a sign of our times. We live in an era when, sadly, the safety of school children cannot be taken for granted. Headlines about school violence remind us not to be complacent, and the threat of violence is just one aspect of security in the education arena.

Video surveillance cannot address all the security challenges in education, but it is a valuable tool and among the least obtrusive options available. And the list of security challenges that video can address grows every day. Video systems can provide real-time monitoring of school premises, and facilitate rapid response to incidents. New advances such as video analytics are currently underutilized in the education arena. Historically, video has been used as a forensic tool in the education market, providing critical information about an incident after the fact. But that generalization is changing.

This **SourceSecurity.com Technology Report** will examine the forces that drive the education market, and highlight opportunities to deploy video surveillance systems in schools, colleges and universities to make them safer. We will focus on one manufacturer, Hikvision, that has a growing presence in the education vertical and whose products and infrastructure are tailored to meet the education market's surveillance system needs.

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IP Adds Value in the Education Market

As video continues to transition from analog to systems based on Internet protocol (IP), video technology becomes a more useful and widely available tool for school systems. In

Hikvision has a growing presence in the education vertical.

the analog age, video surveillance images generally remained on-site, and were mostly used for forensic investigations after an event occurred. Today, networking enables those images to be shared throughout a school system, traveling over existing networks, empowering a more centralized security management structure, and making video more valuable.

Larger school districts generally have dedicated information technology (IT) staff to manage the system's network; partitioning is used to keep the video separate from the other data on the network. Video files are large and could otherwise clog up the network.

Implementation of IP systems simplifies the task of centrally monitoring video from multiple locations in a school district. Sharing video across a network enables a centralized video surveillance "hub," typically located in an administration building, that oversees security and other operations district-wide, including elementary, middle and high schools. In a college or university environment, a hub offers centralized control of video across a large campus area or even multiple sites.

IP video also enables more mobile access to video. For example, a school resource officer at a high school can access video remotely using a smartphone or tablet device. The same functionality can be used in other busy and crowded environments, such as a football game or other event that requires officers to be on-site and simultaneously able to view video.

After hours, school districts can use surveillance to respond remotely to an alarm. Instead of sending a staff member, they can identify the cause of an alarm remotely – was it the custodial staff (no problem) or a student running amok in the hall after hours (security breach)?

Video can also supply police and first responders views of an emergency before they arrive on the scene. When responders arrive, they are better informed to go about their duties. The capability of a police department or outside agency to access school system surveillance video varies widely from one district to another. Whether video is

Video surveillance at schools can better inform first responders of what to do when they arrive on-scene at an emergency.

made available to police depends on the type of agreement a school district has with local law enforcement. Deciding whether to allow access to video involves conversations among the school superintendent, the police chief and other stakeholders. There may be contractual agreements in place to pave the way, such as the police department providing school resource officers (SROs). Sometimes schools opt not to allow outside access to video because of staff or privacy questions.

IP video surveillance expands the possibility of using analysis of video content (video analytics) to provide real-time alerts when an event occurs or access to metrics analyzing possible areas of concern. Analytics could send an alert when a vehicle parks in a no-parking zone or bus drop-off point, for example. An alarm could be sounded if someone on foot enters a restricted area. Analytics such as "object left behind" and "object removed" can be deployed. Camera systems allow an operator to "draw a box" around an object on the screen and be alerted if there is activity within that box. People-counting analytics can provide statistics on occupancy, foot traffic patterns, muster reporting, etc. These and other capabilities of IP-based systems enable video surveillance at schools to evolve from delivering strictly forensic value into systems that provide real-time – and sometimes even predictive – benefits.

School systems also use video outside actual school buildings, and sometimes the benefits of video expand beyond the scope of security. For example, schools can use surveillance to protect school buses and other high value equipment at transportation facilities. At a remote delivery gate, video can enable surveillance of deliveries, and remote communication with delivery personnel, either through a separate intercom or using camera audio. The transition from analog to IP systems makes video applicable to more situations than ever in the education environment.

K-12 Schools Versus Higher Education

The education market encompasses two sectors – the kindergarten through 12th grade market (K-12) and the higher education market. They have a lot in common, but there are differences. For example, higher education institutions are more likely to view live video, given the larger campuses, greater number of buildings, and more public areas where staff and students congregate.

The funding process also tends to move faster among higher-education customers. There may only be one institution involved, in comparison to the K-12 market where more schools (and variables) are involved. Therefore, higher education sales cycles are shorter.

On the other hand, institutions of higher learning are complex institutions. A state university, for example, is made up of multiple colleges that operate independently, each with its own budgets and staff. The fragmented organization increases the challenge. A security system might span across multiple buildings, or even across various semi-autonomous colleges at a university. Decision-making is less centralized, there are more stakeholders involved, and their agendas may not be aligned.

Another difference is that colleges and universities take up larger geographic areas with a wider variety of security challenges. A college campus might be divided by a major four-lane highway, might border a residential area, or could be adjacent to a rail line. Some campuses have their own airports. There is also a wider range of threat levels – a building that houses dangerous chemicals might need a higher level of protection than a building devoted to English literature. There are various types of buildings – security is very different for a residence hall versus an education building or an administrative facility. And of course, it is important to avoid a detention-like feel, and to strike a balance between security and an "open" campus.

When students live on campus, the picture changes, too; security and life safety concerns are more important, and privacy concerns must be addressed. Privacy/masking functions on cameras (including Hikvision's) enable sections of a video view to be "blacked out," to eliminate the view into the window of a residence hall, for example.

As universities and colleges often have students living on campus, stakeholders must also be aware of privacy concerns with security.

Beyond the differences in facilities and stakeholders, K-12 schools also tend to use different camera systems than higher education facilities. For example, given that video from most K-12 school cameras is not viewed in real-time, use of pan-tilt-zoom cameras (which require operator involvement to cover an area) has been supplanted by multi-sensor panoramic cameras. These cameras use multiple sensors to cover large areas with enough detail to allow "virtual PTZ" in forensic video; views can be magnified without losing definition.

Most video systems in the education environment are used as forensic tools rather than in real-time, especially in the K-12 sector. A system is generally not monitored live, but rather is used later to view previous incidents and find out exactly what happened or even to identify the individual(s) involved. It is critical that video is stored and easily accessible. If a child is injured, for example, administrators can review the video to analyze the situation. Video is typically saved for 30- or 45 days. A determining factor in whether video is a forensic tool or is monitored in real-time is student enrollment – a larger facility with higher enrollment is more likely to be monitored.

The K-12 sector largely uses video surveillance as a forensics tool.

K-12 school customers are often influenced by which technologies other nearby school systems – their peer group – are using. Administrators may contact other districts to educate themselves about what technologies work in a similar situation. Other times, they depend more on their architect and engineering (A&E) teams to evaluate and recommend products. K-12 schools tend to be more value-centric than brand-centric in buying video products. They want the most value their money can buy.

On the Front Lines: Crux Technology and Security Solutions

Crux Technology and Security Solutions offers engineering and design services to the education market, covering physical security and video management, network infrastructure and audio-video. The company spun off about a year ago from Huckabee and Associates, the largest K-12 architect in Texas. Currently, Crux does about 85 percent of its business in the K-12 market, in more than 200 school districts in Texas and now in Oklahoma, too. They are generally hired by an architect and design team to focus on security systems, or they may be contracted directed by the school system to provide program management or consulting. In either case, they are on the front lines of how video surveillance is being deployed in the education market.

Like other design firms, Crux Technology communicates with Hikvision to remain up-to-date on new technologies and camera capabilities in the market. Gene Connelly, Hikvision's Central Region A&E business development manager, works closely with Crux Technology. *"When we have specific needs for a camera in a certain situation, he will take us through the choices,"* says Drew Deatherage, vice president at Crux Technology and Security Solutions. *"Gene is very responsive with product information and constant product updates. Not all manufacturers are that easy to work with."*

Crux Technology and Security Solutions is expanding its services, too, helping schools evaluate their security needs. Crux's security assessment services include identifying the security weaknesses at a school and then designing countermeasures and mitigation to solve the security problems, whether it's access control, video management, or even rewriting policies and procedures.

Texas school districts are required to perform a security audit at regular intervals and report to the state. Crux provides outside audit services, which involve meeting with the client, walking the facilities, and providing a written evaluation.

Crux employs former law enforcement professionals to do the audits; some previously worked as school resource officers (SROs) and are familiar with the inner workings of school security. They are also specialists in crime prevention through environmental design (CPTED) and undergo a three-step state certification process.

The need to communicate video product information to a customer depends a lot on the customer. *"The product selection is always up to our clients,"* says Allan Lawrence, director of client services at Crux Technology and Security Solutions. *"Some clients are self-sufficient, some are technology-savvy and do their own research. They are the minority. Many rely on us to narrow down the field of technology choices, to set up product demonstrations, to help them interpret the technical information. "*

Budgeting for Education Projects

A unique aspect of the education market is that budgeting and implementation of security projects generally must conform to a school system's calendar year. Thus, surveillance business in the education market tends to be seasonal. In fact, budget cycles drive the funding for any security project, in contrast to the enterprise market, for example, which tends to be more project-based. Budget decisions can't be rushed, and they are made at specific times of the year. If you miss a budget cycle, you wait until next year for a project to be funded.

In a typical scenario, budget planning sessions are held in the fall or early winter; then projects are put out to bid in the spring; and construction typically occurs during the summer, when many schools are not in session. This cycle is especially applicable to public school systems. In some cases, a project identified in the fall might not go to bid until two years later. Another delaying factor is the number of bids being evaluated for a certain job. Some school systems want three to six bids on a project to ensure a good "sample size" in evaluating the bids. If there are more bids involved, evaluating them takes more time.

Because public school systems (and public colleges and universities, too) are dealing with taxpayer funds, decision-makers tend to be much more budget-conscious than private entities. They may not always accept the lowest bid, but they are unlikely to accept a bid from the higher half of the choices. In some cases, a school system will eliminate the highest and lowest bids and then choose from the remaining bids.

Once a school decides it needs a new system, the project is submitted at a budgetary meeting. Proposals are compiled based on the expertise of consultants and A&Es, or even manufacturers.

A budgeting reality in the education market is that the IT department usually gets more budget than the security department. Therefore, given that video camera systems today are networked, the IT department is often involved in the decision-making of a new system.

In contrast to the budget and bid requirements of public facilities, there is more flexibility in private institutions because funding doesn't come from taxpayers. With private funds, if a need is identified, and there is extra money in the budget, for example, a project could move forward quickly during the current fiscal year.

Integrators with experience in the school market are valuable.

Hikvision is available to confer with security departments, facility management departments, and IT departments about available technologies for an upcoming project. Once a system has been budgeted, it is put out to integrators for bid. An A&E might make a recommendation of a specific integrator since they often know which integrators are most capable of installing and maintaining the equipment.

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Integrators with experience in the school market are valuable, and a past record of completing school jobs can help an integrator win a contract. Education market integrators are familiar with the compressed timeframes involved in school projects and can work quickly, accurately and cleanly, despite time limitations.

New Construction Versus Retrofit

There is also a contrast in education markets between retrofit video surveillance projects and new construction. One difference is the motivation of the installation. In the case of new construction, design of a new, up-to-date security system is only one of many systems that are implemented as part of a modernized school design. In the case of a retrofit system, the driving force is more likely to be a desire to "do more" than the current system can do, whether it's better images, broader coverage, or more modern capabilities and features. The motivation often means that design and procurement of a retrofit system moves faster.

In a newly constructed building, the "building" starts out as a drawing, and there may be no past experience to inform camera choices. Rather, A&Es and consultants must assess the surveillance needs at a more theoretical level. A well-informed manufacturer can offer useful advice on what camera systems are desirable based on building plans.

Also, when installing a retrofit system, there are no delays waiting for the various stages of construction, which can plague a new school project. Installing a video system in a new building that's under construction can be a waiting game while various parts of the building – the drywall, cable drives, rack mounts, etc. – are put into place.

Meeting the Needs of the Education Market

Architects and engineers (A&Es), as well as other consultants, are important players in the education market. They work directly with a school system after the need for a new project has been identified, whether it's a new system in an existing school or even a new school. Manufacturers like Hikvision work closely with the A&E community to educate them on available technology choices and how they can fit in an education project. In some cases, architects include specific product choices in their system and facility designs. (If Hikvision cameras are "flat-specced" into a design, labor costs become the key variable in awarding the bid.)

Security is a hot topic among schools nationwide, and administrators are eager to learn more about technologies and solutions.

Hikvision has a robust team focused on the education market, including Michael Brown, director of education sales in the U.S., and a team dedicated to educating architects, engineers and consultants on video surveillance products geared to the education market. The importance of education customers doing their own research cannot be overemphasized. Hikvision is happy for its cameras to be tested side-by-side with competitors based on verifiable performance and value. Hikvision's generous five-year warranty program is especially appealing to the value-conscious education market.

Hikvision works to establish, maintain and build relationships in the A&E community as a route to increasing business in the education sector. In addition to other benefits, these relationships can identify possible upcoming projects (and future business) a manufacturer might otherwise not be aware of.

Conversations need to be broadened to include the larger security picture and to ensure that basic safety protocols are in place in schools.

The more manufacturers know about the education market, the more helpful they can be to their integrator partners. Manufacturers can also be a valuable resource to school systems and their communities by getting involved with associations and events that cater to the education market. They can help educate school staff and community members about emerging video surveillance capabilities and trends in the market.

Hikvision is often invited to speak at state education association meetings and conferences to provide technology information to attendees and thought leadership outside of the security industry.

Security is a hot topic among schools nationwide, and administrators are eager to learn more about technologies and solutions. In some cases, it's a matter of opening their eyes and "*letting them know what they don't know.*" Brown says: "*You can convey to them the importance of security in general and let them know what's possible with new systems.*"

Conversations About Security in the Education Market

The education market tends to be more reactive than proactive. In many cases, customers don't address security issues until an incident happens. Sometimes it's a high-profile national tragedy like the massacres at Sandy Hook or Virginia Tech. Other times, the impetus to consider security is a troubling local trend, such as an increase in vandalism, or a specific incident. The conversations that begin in the wake of these incidents can evolve into consideration of specific systems (including video) to address the concerns and broader security issues.

Hikvision works to establish, maintain and build relationships in the A&E community as a route to increasing business in the education sector.

It's important not to "sell fear." Security at schools is a very serious subject, and the stakes are high; however, security also must operate in the context of other priorities at a school.

"*Security is a reactive business, and we are always reacting to the latest incident*," says Drew Deatherage, vice president at Crux Technology and Security Solutions, which provides design and project management services for the education market. At the same time, conversations should be broadened to include the larger security picture and to make sure that basic safety protocols are in place. Rather than a school shooting, a security concern may involve an enraged parent, or a tornado, or thunderstorms. Schools should be equipped to address such everyday occurrences, which are much more likely than an active shooter scenario. "*Security and safety is a much larger conversation to have, including training, operations, and what are you trying to protect?*" says Allan Lawrence, director of client services at Crux Technology and Security Solutions.

It's also important not to "sell fear." Security at schools is a very serious subject and the stakes are high; however, security also must operate in the context of other priorities at a school. "*It's a balance*," says Lawrence. "*You can speak about security, but you can't forget that it's a school. You have to strike a protective balance. You can't keep the community out of these buildings, so you balance security design with operational aspects.*" In short, schools aren't prisons, and parents shouldn't feel as if their children are being confined.

Ironically, concerns about privacy (as they relate to video surveillance) do not generally come up in the education market. Rather, the overarching concern is about protecting students – an obligation felt keenly by school systems. Parents also tend to emphasize protection over any privacy concern, although the balance differs across states and/or school systems.

Hikvision's Portfolio of Products

Affordably priced and rich in features, Hikvision's cameras are particularly well suited to the value-conscious education market. Public education facilities will find plenty of Hikvision cameras that deliver high quality at an affordable price for a range of applications.

Panoramic cameras such as Hikvision's Multi-sensor can view large areas in detail.

Precise positioning of cameras is a key facet in the implementation of video surveillance equipment in any vertical market, and education is no different. Schools would certainly want cameras to cover any high-traffic areas (whether foot traffic or vehicles). Cameras would also be used to view any areas where violence or other events have occurred in the past. Common areas of particular interest are parking lots, large courtyard areas, halls and stairwells

Given the variety of education market applications, Hikvision's large portfolio of products offers cameras and other equipment with various capabilities and at many different price points. There's likely to be a product for any need in the education environment. Cameras need to vary because environments vary. For example, for an area that requires video coverage around two corners of a building, a 180-degree hemispheric solution (such as the Hikvision PanoVu Series Panoramic Cameras) might be appropriate. For areas with low-light, or no light, an infrared camera might be better. Some customers find value in pan-tilt-zoom cameras, but they do need to have personnel on hand to operate the PTZs.

In all situations, having feature-rich flexibility at a good price point is appealing. Some cost-conscious K-12 systems may migrate to more basic models, while other schools might go for the feature-rich top-of-the-line models. Some schools prefer "low-profile" cameras, such as small fisheye cameras that cover large areas. *"Hikvision has very capable cameras that can compete with any manufacturer,"* says Deatherage. *"The breadth and variety of cameras is very impressive."*

Some education institutions have personnel on hand to operate pan-tilt-zoom cameras.

Multi-sensor cameras are especially useful in covering large areas – whether indoors or outdoors. Using a single camera to cover a large area can save a ton of money compared to deploying additional smaller cameras. However, in areas where views are blocked, more cameras are needed.

Specific application needs point to the right camera choices. For example, Texas requires that areas devoted to special education have video and audio. Most of those are now fixed cameras (whether 1, 2, 3, or 5 megapixels), with 90-degree or 180-degree fields of view. The camera choice depends on the application. Designers need to consider questions such as: Does it require a long hallway shot, or a wider shot of a door?

For various grade levels, the types of camera deployed are similar, although the number of cameras tends to increase for higher grade levels. There are more cameras in middle schools than in elementary schools, more still in high schools, where the need is generally greater to control problems such as vandalism, fighting or other questionable behaviors. Most states don't allow cameras inside rest rooms, but there may be a camera located right outside watching who comes and goes.

Education: A Challenging – and Rewarding – Market

Education is a rewarding market for video surveillance products and security integrators, but it's also a market that comes with challenges.

Funding processes can seem to proceed at a snail's pace, and budgets are never large enough and always stretched to the limit. The structure of the education market challenges equipment manufacturers to get information about viable solutions into the right hands. The range of applications at education institutions are diverse, so many types of equipment and systems are used.

Fortunately, technology is evolving to increase the utility of video surveillance in the education market. Manufacturers including Hikvision are expanding the equipment choices, providing more capabilities in lower-cost products, and paving the way for even greater use of video surveillance in the education market. The future is bright.

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