

A large market, such as the U.S., is comprised of many market segments, some of which overlap. The electronic security industry is also broken down into separate product sectors and categories. U.S. security players talk about these as well as the challenges each market segment offers, both to the end user and to the vendor.

BY GINNY LU & LING MEI WONG

CCTVs

According to IMS Research, the U.S. CCTV market was estimated at US\$1.89 billion in 2006, growing to \$2.67 billion by 2011. Canada's CCTV market was estimated at \$136.8 million in 2006, growing to \$206.9 million by 2011. These figures were closely matched by other industry players' estimates although some, such as Joel Schaffer, Vice President of Product Development for GVI Security, North and South America's exclusive business partner for Samsung Electronics, put the figure for the U.S. CCTV surveillance market at between \$2.8 billion and \$3.1 billion. Both Michael Usami, Senior Manager of the Product Planning Section at Sony's IPELA Department, and Sean Leonard, Strategic Marketing Manager, Video and Access Systems, Honeywell, gave an estimate of \$2 billion based on industry studies as the value of the market for video surveillance products in North America. Of this, Usami said 40 percent pertains to cameras and 30 percent to recorders (NVRs and DVRs); other products, including displays, matrix switches and encoders, account for the remaining 30 percent. The growth rate of this sector is believed to be 15 percent to 20 percent, said Usami, with IP-based products growing at roughly 45 percent per year. Canada's surveillance market is similar to the U.S. though it is only 10 percent of the size due in part to Canada's smaller population. Leonard's breakdown was closely parallel to Usami's: 40 percent of the \$2-billion figure belongs to DVRs, 35 percent to cameras and 25 percent to system components.

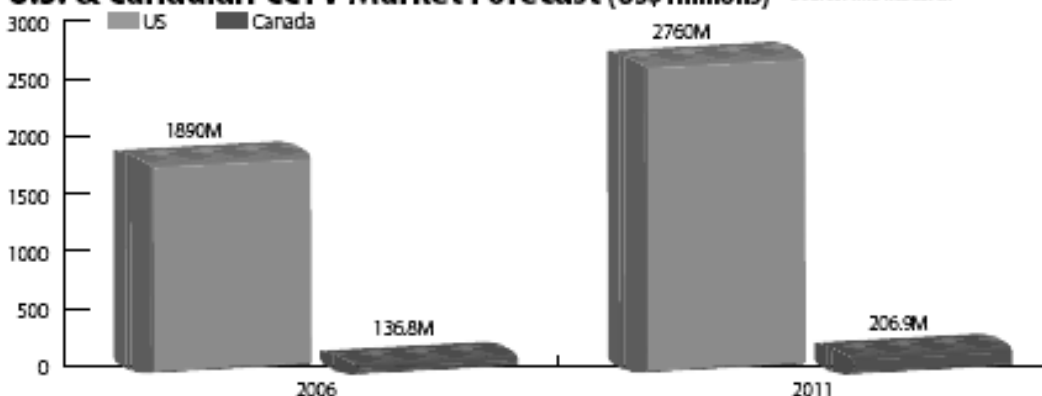
buys. My estimate for the North American market would be \$1.8 billion to \$2 billion."

Similarly, Fredrik Nilsson, General Manager of Axis Communications, believes that the U.S. video surveillance market is worth \$2 billion. This sector has an annual growth rate of between 10 percent and 15 percent. Up to 3 million security cameras are sold in the U.S. per year, with systems integrators installing up to 20 percent of these. "The U.S. seems to have been the earliest adopter of IP-based, video surveillance cameras, followed by Europe. Growth in IP-based cameras in North America is at 50 percent per year."

Nilsson gave two reasons for the growth: need for surveillance in many areas, including banks, airports, retail stores and schools; and IP scalability. "A few years ago," he said, "all of a sudden, IP cameras had a part to play in this growth. This is because there are many things one can accomplish with an IP camera that cannot be done with analog."

"Various market reports put the worldwide CCTV market at \$7 billion," said Oliver Vellacott, founder and CEO of IndigoVision. "This figure includes 6 million cameras sold per annum, but it is difficult to say how much of these figures apply to the U.S. alone. I estimate, though, that the IP market occupies less than 5 percent of the total video surveillance market today. The rest of the CCTV market is comprised of analog and DVR systems. The DVR market is very mature, but IP networking of CCTVs, access control and intruder alarms will eventually penetrate the vast

U.S. & Canadian CCTV Market Forecast (US\$ millions) Source: IMS Research



"The worldwide figure for CCTV is estimated to be \$3 billion," said Steve Weir, Director of International Sales at Cohu's Electronics Division. "However, this number is skewed due to military and government

majority of the market. Market researchers report that the IP market grew at the rate of 40 percent in 2006." Vellacott believes that in order to obtain a meaningful view of the IP surveillance market, one has to understand the difference between a complete, end-to-end IP-video solution from a single manufacturer; and multivendor solutions, which involve sourcing hardware and software from different manufacturers. "Enterprise

systems, such as airports, railway systems and casinos, normally choose complete, end-to-end solutions to achieve maximum performance and smooth deployment with no integration issues."

Schaffer had this to say about the IP-based video sector: "This has been a hot topic for a number of years. Many players have done a poor job of informing end-users of the benefits of this technology, which I think would otherwise have been much further along. Customers are still confused about IP because they have not been educated properly about what IP-based products can do. In the security industry, there are many who are still not knowledgeable about technology this may be the problem." CCTV players who offer IP training courses or classes to end-users and/or installers include Samsung, Sony, Axis, Bosch, Vicon and IndigoVision.

Access Control: Getting In and Out

Systems that provide a high level of protection with a minimum amount of maintenance and manned support hold especially good prospects, according to Freedonia. Access control systems are expected to show the strongest growth due to technological innovations that allow them to employ an increasingly sophisticated array of clearance options and because these systems can effectively replace guards. Advances in this product group will be led by biometric access control systems, the market for which will be worth \$3.6 billion by 2015.

The market research company's findings indicate that the demand for card-based, access control systems is projected to expand 8.3 percent per year through 2010 to \$2.5 billion above-average growth in terms of the broader electronic-security market, but below the forecast average pace for total access control sales; growth will be driven by increasing implementation of access control systems based on smart card technology. Although Europe accounts for most of the smart card technology being used, the U.S. is a growing market. IMS Research has found that, in terms of access control, the U.S. market was estimated at \$519 million in 2006; it will grow to \$739.1 million by 2011. Canada was estimated at \$62.5 million in 2006; this will grow to \$91.6 million by 2011. "One of the big trends is that more companies are not only adding cards to their organizations, but they're also making sure that the cards can't be compromised by adding a foil stamp or hologram," said Kathleen Phillips, Vice President of Marketing and Sales at Fargo, a subsidiary of HID Global which specializes in card printing in a range of applications. "For any company using badges, a card represents a brand very well. With a photograph



Michael Usani, Senior Manager of the Product Planning Section at Sony's P&A Department
Jonathan Whaley, General Manager of Ad-Communications

and data, it makes it easy to identify that person. It's analogous to a credit card there is a limited amount of real estate on that card, so we want to make sure that everything is readable from a distance."

A card printer now on the market does not print information onto plastic cards, but directly onto film, said Phillips. The film is then applied to a plastic card, preventing flaws from appearing on the card caused by uneven surfaces on the plastic. "You can't remove the image off the card; you can't add information to it. The security is embedded into the lamination," Phillips explained. "It's layering on the security, with some type of visual element. For more sophisticated projects, there are covert and overt options, such as flip images, pseudo color, fine line design or nano text. This makes sure that it is an authentic card." The added security is part of a national trend toward more sophisticated identification, she said.

Biometrics in Access Control

"Most people think of biometrics as being for security systems first," said Tom Brigham, Ingersoll Rand Security Technologies spokesman, "but indeed, more biometrics is sold for time and attendance and identification than for access control. In today's convenience world, there is use of biometrics because the company or organization does not have to manage cards. More importantly, there is no lost-card problem. This is why biometrics is so big at gyms and recreation centers you do not need to remember a card; you do not need to remember your key. Customers love it just come in, drop your hand on the reader and there you go. Management saves money, with the record right on the reader. Stand-alone or networked, life is very easy using biometrics. With this solution, past security loopholes with forgotten cards are overcome."

While companies like Ingersoll Rand offer its fingerprint solutions, its hand-geometry reader is popular as well. "Such readers can check 90 points of a big hand in three dimensions," Brigham continued. "A bandage does not matter. It has to do with the throughput, the physics of a bigger (surface) compared with a finger. The sensitivity of the reader, or forgiveness for varying hand measurements, can be adjusted for an application. You can lower the points (of measurement) for a recreation center, or go higher for nuclear plants."

Intelligent Video

In the video content analysis sector, the fastest-growing market segments are "likely not the ones that are traditionally security related," said Edward Troha, Director of Marketing and Communications for ObjectVideo. "There is a lot of discussion about how to turn a video surveillance infrastructure that was initially designed for security purposes into something that enables the user to get other benefits, in addition to physical security functions. With the application of

video content analysis software, there are many more benefits derived from video surveillance. Users do not just want security; they want safety; they want to save energy; they want to understand occupancy so as to better manage their property. This is where we think that the video content analysis market is going."



Edward Troha, Director of Marketing and Communications for ObjectVideo

fastest-growing market segment has been the government sector, said Schaffer in agreement with Sadeh. This can be broken down into military, education and transportation; another developing market is prisons. Most are taxpayer-funded and a lot of this money goes into video surveillance. Transportation is growing at around 12 percent to 14 percent annually. "According to various studies, the U.S. transportation and industry/corporation market segments such as nuclear power stations and petrochemical facilities will grow faster than the ones in Europe due to the U.S.'s strong economic surge," said Schaffer. Growth in the petrochemical and industrial market segments is hard to determine, added Schaffer, as the companies do not like to disclose expenditures on security. Many ask for a non-disclosure agreement before project work begins.

Health care, gaming, correctional facilities and education are important market segments in the security sector and will continue to be a focus area in 2008, said Len Friedman, Vice President of Marketing for the Americas, Bosch Security Systems. Meanwhile, IMS Research pointed to the petrochemical, retail, government and gaming market segments. Marjorie Gurwin, Director of Marketing for Vicon Industries, likewise numbered education, gaming, health care, transportation including airports municipalities and city surveillance. Some of the larger vertical markets in the U.S., said Leonard, are retail, for video and access control; transportation, comprising railroads, ports, airports, and other facilities; and the enterprise/commercial vertical. These are all growing at a rate of over 10 percent annually. Leonard placed education and critical infrastructure in the second tier in terms of size, but growing at a slightly faster rate than first-tier verticals. In terms of education, the opportunities are similar in the large university campus environment and in the Kindergarten through 12th grade U.S. education system vertical. Both have made significant investments in their IT infrastructure, and are looking to build on this backbone to implement security. The education market segment is experiencing big growth for a number of reasons, said Usami, including incidents of violence in U.S. schools some of which have been highly publicized and lack of CCTV systems in schools before the IP age. "In North America, a lot of investment is being driven by homeland security initiatives," Leonard continued. "Over the next five years, there is expected to be large growth in critical infrastructure and education. As the former grows, more communication is wished for between public institutions within a regional area. This will have a pull-through effect on the education vertical." Likewise, Leonard also saw a trend for integration of city surveillance systems with police departments and school systems.



Oliver Villacott, founder and CEO of IndigoVision

A number of market segments are particularly suited to this technology, said Troha. These include banking, transportation, and most especially, retail. In the banking environment, for example, video content analysis software, when incorporated into an ATM-transaction management system, has the capability to ensure that transactions are legitimate. In transportation, the technology can be used to monitor whether high-occupancy vehicle (HOV) lanes are being used most effectively; and, in retail, intelligent video can be used for shrinkage prevention purposes, among a variety of loss-prevention and operational applications.

Market Segments

According to Freedonia, heightened security consciousness has had an impact on many types of institutions, especially educational ones, following various well-publicized incidents of violence. Such incidents often stimulate demand for products like metal detectors and high-end CCTV systems. Institutions also comprise significant markets for intrusion and fire alarms, card- and keypad-based access controls, and basic CCTV systems. In addition, libraries represent the largest market for electronic surveillance systems that has developed to date outside the retail sector. In a somewhat different vein, educational institutions especially colleges and universities use multi-application smart cards. Building access control is one of several capabilities incorporated onto cards. In addition, the cards function as identification and a debit payment cards. Medical facilities also utilize access control, alarms and CCTVs to protect vulnerable populations.

"In the wake of Sept. 11 and the Madrid and London train bombings," said Dagan Sadeh, CEO of Visual Defence, "the lion's share of security investment has been taking place in the border, airport, port and public transportation market segments; that continues today." Come 2008, interest in transportation security will not wane significantly, but the market will begin to see new focus on evaluation and development of security initiatives for public infrastructure, including water facilities and power plants. Since 2001, the

"Due to terror threats," said Michael Rubinov, Marketing Director for NiceVision in North America, part of Nice Systems, "there is a lot of money coming from the U.S. government, which is allocated to transportation, critical infrastructure and city surveillance.

There are large amounts flowing into airport and port protection. Education is one of the newer market segments a market segment in which IP-based video is becoming more prevalent but security in this sector is not provided for by the federal government." Another high-growth market segment is gaming, he said, as casinos are phasing out old VCR technology and installing DVRs or IP-based systems.



Sea port investment has increased in ports since Sept. 11, 2001.

City surveillance, according to Rubinov, is not growing as rapidly as initially expected due to privacy reasons. Projects are being blocked by citizens wary of Big Brother. Schaffer concurred, saying U.S. citizens are more concerned about privacy than their European counterparts. However, more and more people are coming round to the idea of increased surveillance, he added. In the U.S. market, said Mariann McDonagh, Vice President of Global Marketing for Verint Systems, "We see a number of market segments, which have been key in terms of early adoption of IP video and its continuing growth. These include critical infrastructure airports, government facilities, water power sources, energy, chemical plants mass transit both fixed assets such as stations and platforms and rolling assets such as train cars, buses, light rail, trams and transit vehicles (ambulances) enterprise retail, and banking."



Mariann McDonagh, Vice President of Global Marketing for Verint Systems

Challenges

The main challenge from the U.S. security equipment, end user point of view, no matter the market segment, is the selection process, said Rubinov. Which system to implement and which vendor to use are questions

that complicate this process: the U.S. market offers a wide variety of both. Because of different technologies that are constantly added to the market, noted Nir Hayzler, Vice President of Marketing for NiceVision, a big challenge is balancing creation of migration paths from existing infrastructure to secure end user past investments with investment in current and future systems. Solution providers who manage this problem well are the winners, Hayzler believes.

In terms of government, Schaffer said issues lie in dealing with bureaucracy and the highly competitive nature of the business, especially when it comes to high-profile projects. "It is a large challenge to meet the competitive price set by the government. Sometimes, it is not worth a company's time to do the business. However, because of publicity that comes with completing a prestigious project, security companies hope to gain customers from the private industry, who have become aware of the company's activities in the government sector."

In gaming and prisons, end users are very interested in a particular feature of IP-based systems, said Gurwin: virtual matrices. These allow users to instantaneously pull out and view multiple cameras at the same time, without having to do so on one monitor split into up to 16 screens. Digital video can be converted back to analog so that video can go out to regular monitors. This technology will help increase popularity of IP-based systems among end users, Gurwin believes.

Casinos, which are legally required by gaming regulations to have security systems, tend to have very dense camera networks, explained Vellacott, making them particularly suited to IP-based surveillance, as the technology scales "exceptionally well." If a camera stops working, casinos are required to stop gaming activity covered by this camera. These facilities are keen to use IP video.

Corporate enterprise financial institutions are mainly concerned with physical access control and access to data, said Leonard, necessitating an enterprise-wide security solution. One of the drivers in this vertical is tighter integration between IT systems and business work flows utilizing vendors who partner with IT players such as Novell to allow for correlation between physical security and IT security events. In critical infrastructure, the focus is on perimeter protection, said John Fenske, Senior Systems Marketing Manager at Johnson Controls. The Chemical Security Act has been in place since the Sept. 11 terrorist attacks, and is driving growth in this market segment. Challenges include broad, sprawling infrastructure, requiring protection of pipes, tanks, reactors and other equipment, especially near water (for oil refineries and petroleum-based chemical plants) where facilities may not include physical perimeter barriers. Systems

integrators often partner with video-analytic providers and perimeter-protection players to secure these sites, incorporating radar-based equipment into systems. "Each market segment presents different challenges," stated Dave Akin, Sales Manager at L3 Communications. "When it comes to public venues, the problem is, people are there all the time. You do not want to impede movement. Yet, at the same time, you have to create a secure and safe environment. This market segment is also event-driven (a concert or sporting event). In other words, it is not 24 hours a day. In such environments, sometimes it is cheaper to have a wireless solution rather than a wired system."

Another challenge is bandwidth, continued Akin. "Often, end users do not want to see everything that is happening at the stadium. We can, therefore, take video alarms and push them out to the camera, with what we call an 'edge device.' Alarms are added to three or four cameras, and other sensors can be brought in. The system is programmed in such a way that the only time that video is sent is when an event happens. Video analytics can be used." Akin added that there are at least 35 competitors in video analytics in the U.S.

Retail

Retailers are, by far, the biggest CCTV users, said Nilsson. "Here in the U.S., big is beautiful. Huge U.S. retailers the big brand names have thousands of stores; and every year, they build hundreds of new stores. These retailers have surveillance everywhere up to 100 cameras in each store. Such retailers are very cost-conscious; they employ only equipment that provides good solutions at lower total costs. IP cameras are very expensive, but these retailers have realized that by installing and maintaining them, they are saving money in the long run." Even two-year-old analog cameras are pulled and replaced by IP-based cameras as they are cheaper to maintain because of scalability. U.S. shopping malls are also following this trend.

With their continued investment in IT, mainly for data transfer purposes such as credit card transactions, retail end users want to drive a robust infrastructure both in their IT and their customer interface systems, said Leonard. End users in this vertical look for not only security, but also operational costs savings, and increased revenue. The challenge here lies in making transitions easier for end users. "Working with retail customers to provide safety and security for point-of-sale applications is the focus for many vendors." Security systems can be tied into retailers' point-of-sale software, allowing correlation between video and sales transactions.

Transportation

The biggest challenge in mobile transportation is motion, said McDonagh. Systems are not connected to a physical network on a regular basis, thus requiring

hardy equipment suited for rugged environments with vibrations and temperature fluctuations, vandal-proof devices for open-air installations, and simple-to-operate systems able to interconnect with other systems on the go.



Transportation is an important market segment for U.S. security.

A further problem in mobile-transportation security is power supply, said Usami. Cameras on buses mean high power consumption, which is supplied by batteries. Lowering rates of energy consumption is, therefore, a goal that needs to be met by vendors. A little-known fact is that cameras installed on moving buses can be used for city surveillance purposes, Usami revealed.

Axis video encoders have been used by one of the company's end users, a highway monitoring authority, which has placed video on the Internet so that rescue workers can access data, said Nilsson. In mobile transportation, including buses, trains and subways, cameras have to be mounted on the chassis of the bus or railcar or on the ceiling. "If one were to use an analog camera, one would need an interlace scan, which provides the analog camera with a total of 480 lines. This technology shifts through all the odd lines first, followed by the even ones. Then, it puts them together." This, he continued, is great for live video because images look fluid and smooth, but when pausing a VHS tape, it looks strange. In contrast, when pausing a DVD, the image looks clear. DVDs use progressive scan, which is a vital technology for mobile environments because everything is constantly shaking, making details such as faces difficult to see. Progressive scan images are of much higher quality and still images are much clearer. IP cameras use intelligent video to allow cameras to recognize and learn the environment. "Instant alarms can be set off the minute someone uses chewing gum on the camera, sprays it or removes it."

U.S. Department of Defense (DoD)

The very large DoD market segment involves particularly long sale cycles and is very competitive, Akin said. Two things are required: money and time. This market segment includes everything from marine and army troops on the ground combating terrorism in Iraq and Afghanistan, to airports. As such, it is a very mobile market segment. Training is a big aspect of the military, as much training goes into preparing for an

event. For this, video surveillance is used. "In DoD, you have safety; you have security; you have mobility; you have fixed day-night, thermal cameras or infrared cameras not just regular sensoromatic or day cameras all these factors are involved."

The main challenge in DoD mobile security is size equipment cannot be heavy or bulky. "You have to carry that box everywhere across the desert, so it has to be man-portable, something that anyone can pick up and throw over his or her shoulder. Therefore, there is a size element. There is also an environmental issue. In the desert, temperatures can go up to 130 degrees Fahrenheit and, at night, they can drop to as low as 30 degrees. The equipment has to be able to endure all this. Furthermore, there is the power problem as there cannot be any plugging into a wall socket. A good mobile power source is imperative: gasoline, AC/DC or something that you can plug into a car battery. Flexibility is key." Finally, there is perimeter security. "When troops are running across the desert and are surrounded by terrorists, they want to know how close the enemy is before they are right on them. Perimeter security allows for the setting up of safe zones, so that equipment can be deployed to let someone know if a perimeter has been breached. What is also desired is information at a far enough distance to allow for time to respond," said Akin.