High-Resolution Cameras Move the Market

BY ROSA CHEN

As image resolution improves, users can enjoy greater clarity and more image detail from today's growing range of megapixel cameras. Although the technology is becoming more sophisticated, market adoption is slower than anticipated. *A&S* explores the phenomenon.

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Where detailed images are required, cameras can now provide ultrahigh resolution for the accurate recognition of faces, license plates and other indicators. Compared to traditional analog cameras, megapixel and HD cameras have at least three times the resolution, said Nafis Jasmani, Sales Manager for ASEAN at Axis Communications.

These cameras change the way video surveillance systems are designed and deployed. More resolution indicates greater coverage, meaning that fewer cameras are needed to survey a given area. "In the past, designing a surveillance system for an outdoor parking lot, for example, required roughly 15 to 20 standard network cameras. With megapixel, we use only seven or eight cameras, reducing the camera count by up to 50 percent," said Patrick Lim, Director of Sales and Marketing at Ademco.

In countries where the penetration of network video surveillance equipment is high, the adoption of megapixel and HD cameras is generally also high, said Gary Wong, Market Analyst at IMS Research. "By sales revenue, megapixel and HD cameras accounted for more than 20 percent of total network camera sales in 2008."

This year, the market for network cameras is forecast to be US$1.1 billion, with worldwide adoption of megapixel and HD cameras accounting for $354 million, said Steve Collen, Director of Marketing at Cisco Systems.

Within purchases, an increasing number of retrofit projects are specifying higher resolution. "Three years ago, megapixel cameras were deployed mainly in greenfield projects. Today, projects are 70 percent greenfield and 30 percent existing installations," said Paul Bodell, CMO of IQinVision. "Next year, we expect these numbers to even out."

Ellen Cargill, Director of Product Development for Scallop Imaging agreed, adding that analog systems will exist for many more years as users will be reluctant to replace anything that still works. For new systems, network cameras will comprise the majority of sales.

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EFFORTS TO STANDARDIZE

Some best practices have emerged, regarding the number of pixels required for certain applications. For an overview image, for example, it is generally considered that 20 to 30 pixels are sufficient to represent one big section of a scene, Jasmani said. For applications that demand detailed images such as facial identification, requirements can rise to as much as 150 pixels per foot. This is slightly more than 1 megapixel.

Organizations such as the ONVIF and PSIA are in the works of promoting "open" network video surveillance solutions, among which include standards to increase awareness and adoption of

high-resolution network cameras. However, protocol-level compatibility for network cameras does not address codec compatibility, which presents an ongoing challenge to wider adoption, said Gary Perlin, VP of Video Products at Speco Technologies.

On the other side batting for existing analog installations, the HDcctv Alliance promotes specifications for HD video over coaxial cable. "As all of the standards bodies are currently in the early stages of specification design, it's still difficult to assess the effectiveness of their promotion of megapixel and HD technology," Wong said. Many manufacturers agreed.

REAL LIFE

Geographically, the fastest growth for megapixel and HD adoption can be found where there is strong economic activity, pressing security issues and greenfield installations, said James Mihaychuk, Product Manager of Surveillance and IP Cameras, Lumenera. Recently, the Middle East and Asia attest to this finding.

HOT VERTICALS

Wide-area coverage like city surveillance and transportation

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proves to be the fastest growing segment for megapixel and HD cameras, as identification and verification are critical requirements, said Peter Norman, Senior Product Manager, Security Solutions Asia Pacific, Sony Electronics.

Citywide traffic monitoring systems take advantage of existing metropolitan wide-area networks, which makes sense for deploying megapixel and HD cameras, Perlin said.

Projects with state, local and federal funding, such as critical infrastructure, education and defense, are employing more megapixel and HD cameras, Collen said.

In the entertainment industry, there has been some dispute over the adoption of megapixel cameras at casinos. Casinos are unique in the sense that they have a great

need for the clarity of images that megapixel cameras can deliver, but the environment of constant light change from slot machines and digital signage make designing the system difficult. "Casinos today have challenging lighting conditions that aren't optimum for megapixel cameras," Collen said. "This is a prime example of needing to run tests to optimize placement and performance of cameras."

System integrators have an optimistic view. "Most megapixel cameras used in the gaming industry have features that control for flickering light. Others have a proprietary DSP," Lim said. "Also, lighting design is now done in consideration of video surveillance requirements."

Banks and commercial buildings also deploy megapixel and HD cameras at critical areas, such as entrances, to identify those entering and exiting the premises. For these applications, facial recognition and license plate recognition algorithms help alert for blacklists, Lim said.

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SLOW-MOVING VERTICALS

Slowest to adopt are industries that use their surveillance systems as deterrents, such as residential areas, small-to-medium businesses and small retailers. "These sectors are extremely cost-sensitive and have existing analog systems; crossing over to IP-based systems is considered a luxury, not a necessity," Mihaychuk said.

Small retailers, such as convenience stores, see the added cost of replacing present analog cameras, as not being worth the added resolution, said Mark Wilson, VP of Marketing at Infinova.

If retrofitting existing systems to support higher resolution is needed, users can now choose HDcctv. "It will also be the choice for installers needing better resolution but not wanting to learn the language of networking," Perlin said.

SOFTWARE AND INTEGRATION

Frequent questions from users and installers about third-party software compatibility and integration are high among the list of concerns. "For megapixel cameras to integrate, every camera must have an API that allows you to talk to the management server," said Neeraj Purandare, Product Manager for the Physical Security Business Unit at Cisco Systems. "Currently, every manufacturer has to customize an API for each new management server their cameras link to. There is little uniformity or standard. In the future, however, with the ONVIF and PSIA working toward standards, the number of APIs needed will dwindle to two. All cameras can then become normalized for one or both of the standards, to overcome the age-old integration problem."

Customers usually want to know if they replace one or two cameras now, and are considering replacing other units in the future, how many separate APIs are needed. "Generally, if one camera is integrated, the rest of the offered line can be supported as well," said Robert Gailing, National Sales Manager, Security Products Group (Consumer Solutions Division), North America, Sanyo.

Presently, however, integration still poses a challenge. There is such a wide range of megapixel and HD cameras, meaning that demands vary greatly on the network video management software (VMS) used. Megapixel cameras with fewer features may be easier to integrate. However, using cameras manufactured by multiple vendors on one VMS platform may diminish the end result, said Michael Hodor, Senior Sales Director of Western North America, Latin America and Asia Pacific, Avigilon. "Sophisticated features of cameras may not be supported by third-party software that is not designed especially to support megapixel cameras."

Megapixel and HD cameras are perfect tools to take advantage of video analytics, but there are few analytics providers that make full use of their capabilities. "One camera is capable of running multiple algorithms in one video stream, but very few analytics providers can do this," Lim said. For example: With a megapixel or HD camera, two events in a parking lot, such as loitering and illegal parking, can be detected simultaneously. The analytics can zoom in to capture the face of the person loitering and pick up the illegal parking vehicle's license plate. This is a much more efficient use of the camera.

PRICING ISSUES

The current high prices of

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megapixel and HD cameras are still market barriers, but prices are forecast to decline for three reasons: Megapixel sensors are declining in cost; more manufacturers are releasing these cameras; and more open standards will lower the barriers of entry for new vendors, Wong said.

Compared to standard network cameras, megapixel cameras are sometimes two to three times more expensive, depending on frame rate and resolution, Collen said. "However, you should not make a choice based on price. Rather, you make a choice based on application."

In practice, more users are requesting for megapixel and HD cameras, but asking for them and being able to afford them are two very different things. "There is definitely an explosive growth in inquiries, and the awareness for the technology is certainly growing," Lim said. "The problem is price point. Today, network cameras account for nearly 50 percent of our video surveillance revenue, but actual deployments of megapixel and HD cameras are still only 10 percent of this revenue."

Developments in cost-saving features such as PoE and automatic focus and zoom have given megapixel cameras more appeal; however, market adoption is still lagging. As price comes down, requests shall eventually turn to purchases.

BRANDS

In general, larger brands invest more in R&D and compliance requirements set by the International Organization for Standardization (ISO), which means that product quality is generally higher, Lim said.

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Smaller players are less concerned with the quality and continuity of products, and are more concerned with selling volume.

Megapixel and HD cameras manufactured by Asian vendors have been known to deliver resolution and sensitivity that do not meet the quoted specifications, Perlin said. "Furthermore, poor documentation, nonexistent technical support and failure to honor warranties are also problems we have encountered. However, there are many lesser known Asian brands with excellent quality if you know where to look."

EDUCATION IS KEY

There is a learning curve involved. Optimal results can only be achieved when customers are properly educated, as to what to expect from a price-performance viewpoint. Market adoption will then follow. Manufacturers should demonstrate their equipment to customers and work with them to determine what resolution is needed, Perlin said.

Both the advantages, such as increased image resolution, and disadvantages, such as increased storage and bandwidth, must be highlighted for users to gain a realistic understanding of the technology, Wong said.

As such, the technology is poised for widespread deployment, but user awareness and knowledge prohibit rapid growth. Customers need to learn the differentiations among types, formats and specifications, as well as how this technology changes or affects other parts of the surveillance or even IT system. Without clear comprehension, users cannot make the right decision or be fully satisfied with a purchase.

Most manufacturers agree that megapixel and HD cameras are the future of video surveillance, but that future can only be realized if steps to overcome these current market barriers are properly addressed. ▪