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Technology Report

Loss Prevention & Beyond: How Video Innovation Enriches Retailers





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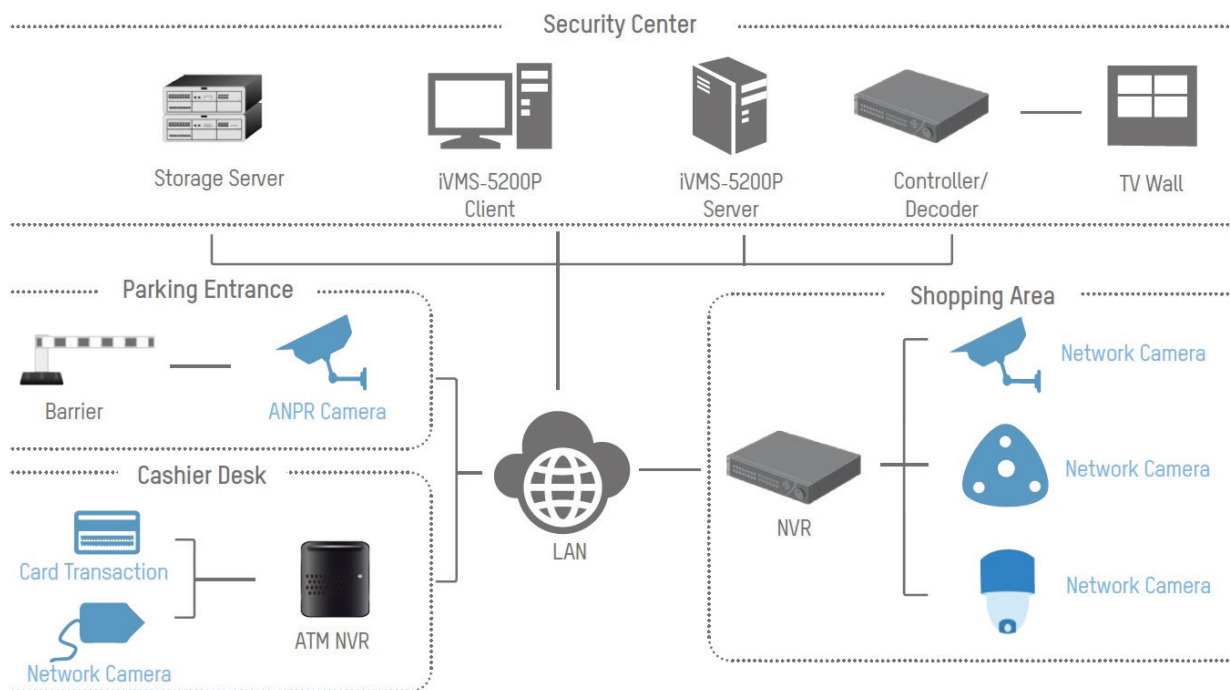
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Loss Prevention & Beyond: How Video Innovation Enriches Retailers

The retail market is facing unprecedented challenges as brick-and-mortar locations struggle to redefine their role in the age of online commerce. Retailers also deal with continuing, age-old requirements to minimize costs in a competitive landscape and to provide services and a customer experience that encourages repeat business.

Video surveillance technology today offers new tools to help retailers. Video in the retail sector has long been associated with loss prevention – providing that “eye in the sky” for store security personnel. But just as retailers are re-inventing themselves, so is video technology.

The biggest change in video is a transition from analog to systems based on Internet Protocol (IP). Networks of cameras connect like computers and can become part of a retailer’s information technology (IT) infrastructure. From the retailers’ perspective, the other exciting development in video is more capabilities at lower costs. Cloud-based systems are also having an impact. Video systems that provide more value to retailers are creating new opportunities, doing more for less money, and expanding the role of video in the retail environment. In effect, video is offering new tools for retailers right when they need them the most.



Various elements in a retail organization can be tied together using a unified video surveillance system.

For new installations, the IP transition is happening faster. Today, more new video system installations in the retail sector are IP-based.

The Transition from Analog to IP

The transition from analog to IP video technology is well under way in the retail sector, although there is a huge base of analog systems still in use.

For new installations, the IP transition is happening faster. Today, more new video system installations in the retail sector are IP-based. One Hikvision integrator estimates 70 to 80 percent, or more, of new video systems are IP, especially for larger customers. Every year sees an increase – four years ago it was probably 30 to 40 percent of new customers.

Larger retail operations with existing video systems tend to be slower to transition to newer technologies. For example, a large retailer with both corporate stores and franchisees may elect to adopt newer technology at corporate-owned stores, but can only recommend that franchisees follow suit. In fact, franchisees may elect to stick with older, more familiar equipment, whether because of costs or simple inertia.



Hikvision's TurboHD™ products are simple to install in retail environments.

Smaller retail customers may wish to make the transition to IP, but costs are a problem. Hybrid equipment can help. For example, Hikvision's hybrid NVR/DVRs allow flexibility for retailers to retain analog cameras in some locations and to install IP cameras in others. The approach enables franchisees and smaller business owners to “layer in” additional IP cameras while keeping their existing analog infrastructure. [A network video recorder (NVR) connects to IP cameras, while a digital video recorder (DVR) connects to analog cameras; a hybrid NVR/DVR can connect to both.]

Another alternative for existing analog systems is Hikvision's TurboHD™ range of NVRs (HD over analog) and HD-TVI (High Definition Transport Video Interface) cameras, allowing retailers to reuse analog cabling (coaxial and electrical) and replace older analog cameras with 1080p versions, sending uncompressed, high-resolution video over coaxial cable.

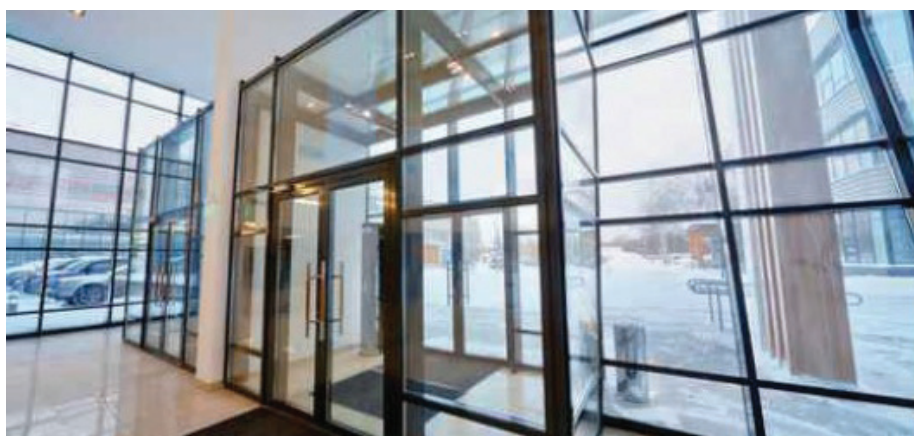


A four-channel TurboHD™ system by Hikvision connects like an analog system, but provides higher resolution.

Familiarity with existing equipment is a large factor in retail, perhaps more than any other vertical. Store detectives who use video to track shoplifters are used to working with analog equipment, and are comfortable with their responsive pan-tilt-zoom (PTZ) controls, which make it easy to follow a shoplifter through the store. In order to apprehend a suspect, they have to maintain continuous observation of the customer. Newer, software-controlled PTZs have traditionally suffered from latency, so if a suspect changes direction suddenly, the video operator could lose them.

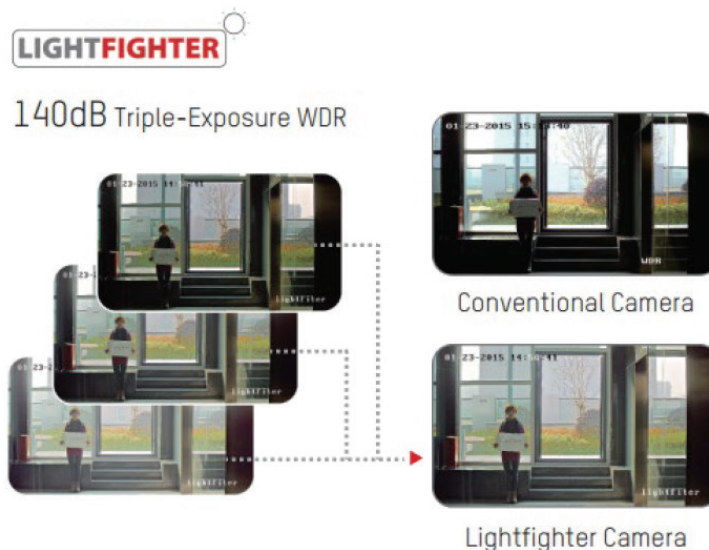
New systems have addressed the problem of latency, but the operators may still not be comfortable with software-controlled PTZs or other features. Newer graphical user interfaces (GUIs) are more intuitive and easier to use, and integrators and manufacturers are seeking to do a better job of training users on the new systems, helping them get used to the feel and control of a new system, to facilitate a changeover.

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Extensive use of glass in shop entrances provide a challenging lighting environment for video

New Cameras Expand Capabilities



Lightfighter WDR improves images in backlight situations common in retail environments.

Video camera technology is evolving in ways that provide specific benefits for retail end users. The latest cameras are better at dealing with issues of glare and backlighting in glass areas at the front of a store, for example. More resolution, provided by high-definition (HD) cameras, means less pixelation. Hikvision's LightFighter cameras with ultra-high WDR (wide dynamic range) deliver clear images with true color reproduction in brightly lit or high-contrast environments, particularly suited to intense backlight situations. Hikvision's DarkFighter series of ultra-low-light cameras work well after hours in a warehouse or retail operation, providing color images down to 0.001 lux and black-and-white images down to 0.0001 lux. The "DarkEye" SLA (Super Large Aperture) lens enables operation of the camera at a consistently large aperture, at any zoom setting, for maximum low-light performance.

Smaller, less conspicuous cameras, such as Hikvision's pinhole cameras or mini-domes, may also be favored by retailers concerned with aesthetics or wanting their surveillance system to have a low profile. Hikvision's large product line provides plenty of choices, and standardizing on one brand of cameras minimizes training cost.

Power over Ethernet (PoE), which provides power to a camera as part of the network connection, eliminates the need for a separate power supply (another potential point of failure). Integrators will also save on labor with simplified cabling installation (cameras are networked rather than each requiring a "home-run" coax cable back to the front-end). Simply put, IP solutions are easier to configure from a cabling perspective.

More camera functionality (at lower cost) is driving less expensive systems, providing more value for retail customers.

A typical remote video management scenario in a retail environment would consist of a Hikvision NVR at each remote location, with the entire video network tied together in a head office or loss prevention control room using a management server to connect to hundreds or thousands of stores. Hikvision's concept of plug-and-play NVRs makes installations easy and keeps costs low. A camera's IP address is automatically configured by the simple act of plugging a PoE cable into a network interface.

More camera functionality (at lower cost) is driving less expensive video systems, providing more value for retail customers. For example, fewer cameras are needed to cover the same areas (because new cameras see larger areas with more detail). Also, integration of Hikvision cameras with NVR/DVRs and video management systems (VMS) from third-party manufacturers – such as Genetec, Exacq or Milestone – enables use of less-expensive Hikvision cameras in those installations as a way of stretching the budget. Using Hikvision cameras might enable an increase from 20 cameras to 28 cameras within the same budget, resulting in increased functionality and faster ROI.



Compatibility of Hikvision cameras with a range of systems enables integrators to substitute better-value cameras at any point in planning a system. Any skepticism about changing brands can be alleviated with ease by showing a customer two screens with views from competing camera brands and asking them to assess the difference.

Hikvision's cameras and other video equipment offer a strong array of base-model features, and Hikvision works with partners who use its application programming interface (API) to develop even more capabilities based on Hikvision products. Hikvision has a full catalog of products, and technology partners expand the options even further.

Cloud-based systems work extremely well with multiple, distributed sites – a fundamental aspect of retail.

Cloud-Based Systems in Retail

There are unique opportunities for cloud-based systems in the retail vertical. Cloud-based systems work extremely well with multiple, distributed sites – a fundamental aspect of retail. Cloud systems minimize the need to manage equipment and hardware at each site. There may be no staff at a retail location who can maintain, backup, reboot or take care of a video management system. And with video in the cloud, there doesn't have to be. Also, fewer trips are needed to individual stores to maintain the surveillance system, as all the video can be viewed remotely – from headquarters, a head office, a manager's mobile device – and can be sent remotely to police without anyone having to visit the store. Cloud systems also improve and simplify the mobile experience. Users can view video easily wherever they are in the world.



IP systems, such as Hikvision's Smart IP pan-tilt-zoom family of products, expand the capabilities of surveillance in retail environments.

Cloud-based video systems are more secure, too. The video is stored offsite, so it can't be stolen by criminals. Cloud systems can also integrate with general business systems and analytics.

Cybersecurity is also paramount, and cloud systems are "locked down." Customers don't have to worry about the vulnerability of their cameras to cyberattack.

“With the cloud, rather than a capital expense, it’s pay-as-you-go,” says Dean Drako, President and CEO of Eagle Eye Networks, a cloud video service provider that sells through the security dealer channel. “You only pay for what you use. And it’s flexible. You don’t have to predict how many stores you will have and where, or move excess equipment [except cameras] from one store to another.”

Cloud systems are also always up-to-date. *“The cloud system is only going to improve and get better,” says Drako. “The customer doesn’t have to do the upgrades, or send somebody out to make sure it works. The system just gets better and better every day. It’s all good. That works well for retail folks who may not have the experience with video systems.”*

Compatibility of cameras with cloud-based systems is critical, so cloud companies such as Eagle Eye work with various camera providers, including Hikvision, to ensure smooth operation. Even analog cameras can be used with cloud systems. *“Some customers want cameras with microphones, some with night vision, some with HD, some want WDR (wide dynamic range) cameras,” says Drako. “It really depends on what the customer is trying to do and what they are wanting to spend.”*

Eagle Eye Networks and Hikvision work together to ensure compatibility using the ONVIF protocol, fine-tuning as required so the interface works even better.

Eagle Eye Networks’ system involves placing a small bridge/router at each site. All the cameras on the site connect to the router, which serves as a bridge and a “traffic cop” and communicates with Eagle Eye’s cloud service.



Return On Investment (ROI) in Retail

Return on investment (ROI) is a key metric in any business, but is especially so in the retail sector, where profit margins may be narrow and could be threatened by the installation of any equipment that doesn’t “pay for itself.” Expanding uses of video boost cost-justification scenarios for any retail business.

More cameras are being installed in retail environments, and the value of camera systems extends far beyond loss prevention. Everyone may immediately think a camera is for loss prevention, but some cameras today can also be used to ensure compliance with PCI (Payment Card Industry) regulations, standards for retailers who handle credit cards. Regulatory factors are requiring camera systems with additional storage – up to 90 days. Cameras can watch a server to ensure PCI compliance. Using video to ensure compliance may have been cost-prohibitive several years ago, but not anymore.

More cameras are being installed in retail environments, and the value of camera systems extends far beyond loss prevention.

Camera systems also contribute to general liability and safety for retailers. Cameras are being deployed to watch escalators and parking lots (where personal injury liability claims might originate), prompted by the risk management department rather than loss prevention.

Cameras can detect if a person is present when an employee provides a refund, or voids a sale, or performs some other high-risk transaction.

Snippets of video can also be used in training to show good and bad examples of employees in action.

But that's just the beginning of the value video provides to retail operations beyond loss prevention. Big value comes in the areas of operations and merchandising.

Value for Operations and Merchandising

Even systems originally installed for loss prevention may extend their value if video access is provided to other departments, such as operations and sales. The same camera views used for loss prevention can enable owners or managers to inspect their stores: How much stock is in the back room? Is there a backlog of merchandise? How long is the queue at checkout? Did the store open on time? Are the right people in place? Has the store completed the planogram?

Using information gleaned from video is another useful tool for retailers, especially when combined with other information to yield analytics of – and insights into – store operations. The most common example is conversion rate: How many people who come into the store actually buy something (and how much)? A camera with people-counting capabilities, mounted at the entrance, provides a total number of customers, which can be compared with sales numbers to measure conversion, for the day or during various periods throughout the day. If one store is not performing on par with the others, the conversion rate number can provide a red flag. There may be customer service or staffing issues. The queue wait may be too long. Staffing may be inadequate at peak times. More and more retailers are using conversion rate to help them manage their businesses more effectively.

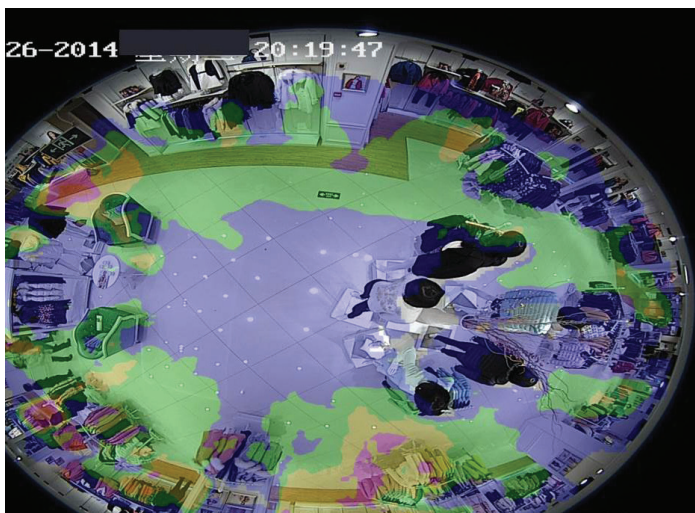


DarkFighter cameras by Hikvision.

Retail businesses leverage video system capabilities such as heat mapping, people counting, monitoring queue times, etc., to achieve goals beyond loss prevention. People counting at the edge (inside the camera) provides a useful “pull” solution (rather than a “push”) for a smaller retailer, providing a people count as needed on a daily or weekly basis, even if it isn’t integrated with other software/analytics systems. A Hikvision Professional 4 Line series camera, mounted overhead at an entrance, counts people who enter the store; the camera can also be used to count objects that cross a virtual detection line (to analyze traffic flow). Specialized “mini” fisheye cameras, suitable for indoor small surface areas, also include a people counting analytic.

Cameras also help analyze traffic patterns in the store. When a person comes through the door, do they go left or right or straight ahead? What impact does such information have on how products are merchandised? There is also the concept of dwell times: How long do people stop at an end-cap? Heat mapping capabilities of video cameras provide a color-coded image of traffic patterns and dwell times – hot spots, slow areas, bottlenecks, etc. – a valuable tool for analytical retailers.

Retail businesses leverage video system capabilities such as heat mapping, people counting & monitoring queue times to achieve goals beyond loss prevention.



Heat mapping capabilities of fisheye cameras can detect customer traffic flow and provide other intelligence.

Hikvision’s 360-degree fisheye cameras provide heat mapping, and the ability to specify zones to view, for example, detecting whether people stand longer in front of a certain display. The Hikvision 360-degree fisheye camera line provides 3-, 6- or 12-megapixel resolutions. The fisheye is a convex lens that provides a wide-angle field of view, with the scale being reduced toward the edges, resulting in a “warped” view. Hikvision’s camera series offers hardware de-warping and a variety of viewing modes – original fisheye, horizontal panoramic view, or quad view with virtual pan-tilt-zoom (PTZ) to any region of interest.

Video can help with managing staff: If one location in a city gets busy, managers could send staff from another location to help handle the rush. Monitoring retail traffic – and fine-tuning staffing levels to ensure that adequate (but not surplus) staff is available – can help retail customers control their labor costs more effectively and contribute additional ROI.

Leveraging Video in the IT Environment

Video can operate as a component of a retail business's IT infrastructure, and as such can complement other IT technologies, such as point-of-sale (POS) systems, to benefit the retail environment.

A Hikvision partner currently leveraging the value of video in an IT environment is POSRG, which has been in business since 2006 and serves a range of retail businesses, including grocery and convenience stores, cruise lines, casinos and amusement parks. Supplying "cradle-to-grave" IT and POS systems, the company specializes in serving enterprises (companies with 10 or more locations), constituting 90 percent of their business. Systems include POS, surveillance, auto-ID, servers, routers, telephony, printers, media, and touch screens. POSRG began as a "remarketing group," repurposing older equipment for new uses (the letters of their name stand for "Point of Sale Remarketing Group). But today, roughly 50 percent of their business is new equipment, including Hikvision cameras and DVR/NVRs.

POSRG has been supplying surveillance systems for about three years, and last November decided to standardize on the Hikvision brand. *"Because we work on the enterprise side, we need a continuity of the product line, and a consistency,"* says Reggie Saghafi, Director of Sales, US and Canada, POSRG. *"We go to market with one horse. I heartily believe you have a responsibility to vendor partners to align correctly. In a project, we say 'this is the manufacturer we want to bring in.' We lead with Hikvision exclusively when it comes to surveillance. If a customer says 'I want to put a surveillance system in,' I say 'let me introduce you to Hikvision.'"*

Customer support is an important factor in POSRG's decision to standardize on Hikvision. *"If I am rolling out a system for a chain of fast food restaurants, I need consistency on the product side, but I also need support,"* says Saghafi. *"If I have the support, the price is a non-issue. With Hikvision, there is a live person answering the phone if you call; there is help on the website, downloads. They do whatever they can to make the product work. Price was not the main issue. Quality and support are the key issue."*

POSRG uses a range of Hikvision video products – IP and analog, indoor and outdoor, bullets, domes, night vision, higher resolution – to capture motion and people in a variety of scenarios. Covert pinhole cameras might be mounted inside fast-food drive-through speakers, or a camera might be mounted for public view. New cameras offer clearer resolutions to improve capture of facial features, and better images are available in the dark, 30 to 50 feet away. Resolution also enables cameras to capture cash denominations when watching transactions. If a customer says "I didn't get enough change," a manager can check the video.

"There are so many choices, we don't have to change brands," says Saghafi. *"Hikvision's range of cameras allows us to select what works best based on customers' needs, whether it's cold temperatures or humid and hot."*

Video can operate as a component of a retail business's IT infrastructure, and as such can complement other IT technologies.

Familiarity with one brand of NVR and a unified and standard operations environment enables POSRG to provide a maximum range of options when designing a system, says Saghafi. Lower camera costs – and more functionality for the price – make systems more affordable.

For POSRG's end-user customers, video analytics “thresholds” are set on individual cameras to provide alerts to managers of a variety of situations requiring attention, says Saghafi. If someone falls down in a restaurant, did they get tripped or “trip themselves?” What if a disgruntled employee starts destroying equipment? Restaurant owners can view a car approaching the drive-through after hours, see what's going on in the parking lot, and keep watch on money transactions.

The retailer sets the threshold of things they want to see, and can adjust the threshold. For any event, they can view live or recorded footage on a Web portal. In the case of an incident, pre-event and post-event recording can help authorities understand exactly what happened, whether it's money missing from the cash drawer or a broken window. Integration of video with POS systems ties video images to any transaction.

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A retailer might want to be alerted if someone gets near the backdoor of a business after closing, if someone is inside the building after hours, or if people are loitering in the parking lot or sitting in the drive-through after closing. All these events can be recorded, and thresholds can be set on each camera. An NVR can send multiple emails – to an operations group, for example – to ensure that someone will respond. Thresholds can be adjusted if too many alerts are being received.

Providing an Operations “Window,” and Responding Quickly

Video provides a “window” to view a retail business's operations, and to respond in real time, which is particularly useful in multi-site operations that are managed centrally. Voloforce, another Hikvision technology partner, provides a good illustration of the concept.

Does this store conform to the corporate expectation of a customer experience? What specific tasks should be performed to correct any deviations? Is my display fully stocked? Are my marketing signs correct?

Paul Zsebedics, CEO of Voloforce, defines “loss prevention” in a broader sense than it is generally understood in retail. He says the term extends beyond its traditional definition related to shoplifting and theft. Many retail stores also lose money because customers walk out of a store without buying anything due to some lapse in customer service or a general lack of appeal. *“It isn’t just the individual thieving, it’s the day-to-day customer who leaves the store without buying anything,”* says Zsebedics. *“Retailers lose money because of lack of execution.”* Preventing these types of losses requires that stores be more effectively managed in real time, and video has a role to play here, too.

A software developer by trade, Zsebedics was intrigued in the retail market with the idea of being able to visit a store remotely using a video camera. Loss prevention departments (using the more traditional definition) have plenty of cameras in retail stores, but the systems are mostly locked down, and the video is not available for operations. Therefore, Zsebedics sought to leverage the video feeds from those cameras in new ways to promote better management of retail locations. Retail is a challenging business, and better technology solutions are needed to meet the challenges.

Zsebedics says Voloforce provides new technologies to manage retail operations. The “retail workforce execution platform” provides retailers immediate insight to their store execution across sales, merchandising, marketing, operations, and social media campaigns. The system is based on the idea of checklists, a common tool for any business. Voloforce adapts checklists to a digital format and adds a new element – video – as a tool to hold employees accountable for performing listed tasks. In effect, the system communicates a needed task digitally (using a smart phone app) to an employee at a retail location: “I need this done and returned to me in 20 minutes.” Then, the manager requires the employee to respond with a textual/numeric input and provide a video image to support the message that the task has been accomplished. Finally, the manager confirms from the video image that the task is accomplished.

Most importantly, it all happens in real time. In other words, the business is being managed (with the help of video) in the present, not through a “rear-view mirror,” which is how Zsebedics describes the practice of collecting analytics to guide the course of a business. *“We understand the end result you are looking for, and as the data comes to us live, our app has the ability to manage a single location autonomously,”* he says. *“Managers can find that ‘needle in the haystack’ and manage the situation in real time.”*



The Voloforce thin client lets a manager “tour” a store and command-and-control remotely – selecting a section of video from the “tour,” creating a dialog with the store, and ensuring that any corrective action is achieved.

“Our system allows managers to remotely manage a number of stores, and to visit more retail stores per day,” says Zsebedics. The focus is on operations, not theft control, and managers are looking for product counters, categories and displays – the location’s look and feel. Does this store conform to the corporate expectation of a customer experience? What specific tasks should be performed to correct any deviations? Is my display fully stocked? Are my marketing signs correct? Voloforce allows managers to “peer in” and see for themselves, using tablets and computers, on iOS or Android devices. *“We use information – email, SMS, Apple push notifications and Android push – to drive execution in the store,”* says Zsebedics. *“The Millennium Generation is used to receiving information in a social environment.”*



Fisheye cameras provide 360-degree views of retail environments using a convex lens.

Voloforce’s software interfaces with Hikvision NVRs, which are installed in retail stores separate from existing VMS systems (used for loss prevention) and access independent video streams from existing cameras for use in a separate system for operations. Voloforce accesses video images from the NVR, which are mapped to specific

product categories, and the system is simplified for easy searching of images, the same way one might use Google Search. Video isn’t being streamed to the cloud; rather, the system is creating snapshots and thumbnail images that can be used in the cloud to assess and correct operations issues. Zsebedics says the color and clarity of Hikvision images are the closest to real life, which is important when dealing with product displays, whether in darkness or in light. The Hikvision NVR can be connected to any camera using ONVIF standards.

One of Voloforce’s markets is retail locations of mobile smart phone carriers, where a primary concern is protecting the privacy of customers. Video can monitor whether employees are leaving sensitive paperwork lying around, or throwing it in the trash can (where it could be retrieved).

Impacting Retail Beyond Loss Prevention

Retailing and video surveillance are two markets currently facing upheaval and transformation. Fortunately for retailers, video surveillance changes are providing opportunities to deal more effectively with the transformation they face. Less expensive equipment and ease of installation make video equipment more accessible. Technologies such as people counting and heat mapping are providing new data and tools for retailers. Clearer images and more features are expanding system capabilities. And human ingenuity is developing new ways technologies can be applied in the retail vertical.

Retailing may always be a challenging market, but video systems are poised to play a larger-than-ever role in addressing those challenges in the future. Loss prevention is just the beginning.

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