IP VIDEO SURVEILLANCE IN THE RETAIL INDUSTRY
## A MILESTONE BLUEPRINT ARTICLE

People who work in the physical security industry tend to notice a lot of details. Like how many video cameras are present in your local supermarket, shopping mall, or home improvement store. It is absolutely astounding! The problem of course, is shrinkage which costs USA retailers an estimated 1.4% to 1.7% of sales. At a net loss of over $30 billion per year, there is a lot of motivation to come up with effective counter-measures.

How does video surveillance rank in terms of effectiveness? Not very well if the system is based on cheap analog cameras – and in the retail industry at large, bad video quality is rampant. The problem I have as a Certified Milestone reseller is to convince the store owners and security staff that they should spend more than twice as much on a state of the art IP Video system versus the Taiwanese DVR and cheap analog cameras that someone else wants to sell them.

It's a tough sell, but one made easier if you understand the specific threats to the store's profitability and can design a better mouse trap. Analog cameras and DVR's have served this industry well over the years and systems frequently do get upgraded. The goal of this blueprint is to demonstrate key advantages of IP Video systems toward addressing specific threats in retail.
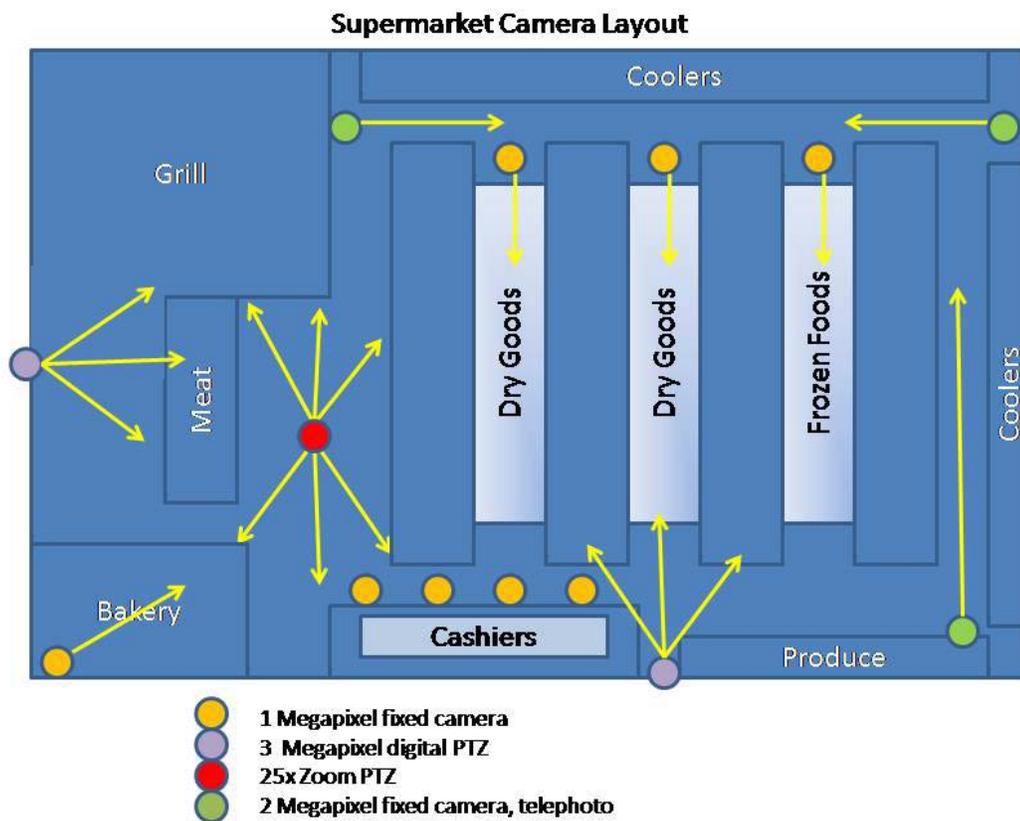

Camera Views in an Office Supply store
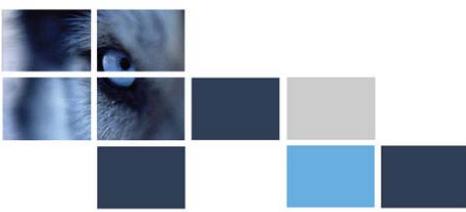
Designing effective Anti-Shoplifting systems

Good camera placement, appropriate lens selection, and adequate lighting are the fundamentals that are important to a video surveillance installation. The key difference between analog systems and IP Video is resolution. You will be able to see more detail in a scene and be able to cover a larger area with fewer cameras. Almost all stores have long aisles of merchandise that will be difficult to cover with standard VGA cameras. This design uses some specialty cameras to best cover the difficult shots.

Supermarket Camera Layout

- ● 1 Megapixel fixed camera
- ● 3 Megapixel digital PTZ
- ● 25x Zoom PTZ
- ● 2 Megapixel fixed camera, telephoto

MegaPixel Cameras

Consider a typical Supermarket layout. The prevalent camera in this design is a one megapixel mini-dome camera that will typically be wall or ceiling mounted. The vari-focal lens allows the installer to frame the view around the area of greatest interest – usually the most popular and highest value items in the store. Audio is available on many cameras now, and is fully supported in the Milestone software. Consult the local regulations regarding informed consent for audio recording as they vary widely from state to state.

Be sure to read Paul Bodell's article this month about what constitutes 'forensic video'. There are simple formulas that determine how much detail you will be able to see. At a cashiers stand,
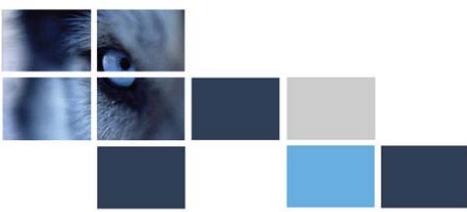
you may want enough resolution to actually see the money change hands. Choosing the right lens is imperative.

New Types of Pan/Tilt/Zoom Cameras

Where large open areas exist, a wide angle lens on a megapixel camera is all you need for digital Pan Tilt Zoom capability when using the Milestone software. In this example a three megapixel digital PTZ camera allows you to move a 640x480 window anywhere within the scene. The cameras have no moving parts, so customers never know where you are looking and there is no wear on a PTZ mechanism.

Traditional PTZ cameras are a great tool if you have a staffed monitoring station. In larger stores, an employee tracks activity from an office location looking for shoplifting, internal theft, or suspicious activity. The two most important characteristics of this PTZ camera are positioning speed and zoom. The camera should be fast enough to easily track people as they walk through the store. The dome will be smoked, so camera position will not be obvious. The zoom lens must be powerful enough to cover all line of sight opportunities, and auto-focus, auto-iris is essential.

In an unattended mode, PTZ's can be used effectively when set on patrol. The Milestone XProtect product line has a useful feature that pauses patrolling when motion is seen. This is great for mostly empty areas (like parking lots at night) but will not be effective in a busy store where there is constant motion. New algorithms for auto-tracking are looking very promising in some of the higher end products.

Long Shots with High Resolution Telephotos

For very long aisles, a fixed camera with telephoto lens and at least 2 megapixel resolution is the best solution. Telephoto shots will have high depth of field so that most objects will be in focus, both close and far. The high resolution will allow 'after-the-fact' zooming of captured images in the Milestone software.

Note that this design is only feasible using an Open System approach to system integration. The Milestone XProtect product family supports more cameras, plug-ins, and partner products than any other video management software on the market.

Understanding Internal Threats

Shoplifting is the first and most obvious threat but not the largest.   According to a National Retail Security Survey report, 48.5% of all shrinkage was due to employee theft and 31.7% was due to shoplifting. The balance was in administrative errors and vendor fraud. Catching shoplifters is easy compared to internal loss. There are dozens of techniques that are well known to employees working as cashiers or on the shipping dock.
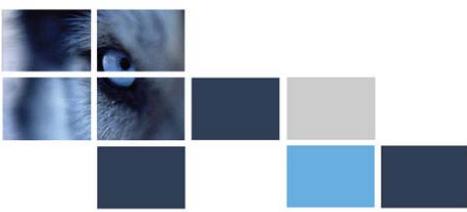
Examples of Internal Theft:

The Hidden Scan: A 'Friendly Cashier' fakes a scan of an object by turning it over as they cross the barcode reader.

The Phony Return: The Customer Service desk accepts back merchandise that wasn't purchased, or marks good product as defective.

Coupon and Discounting Fraud: A cashier discounts products inappropriately.

Credit Card Fraud: Cash credit is placed back on a card other than the one which made the purchase. Cash back is given to stolen or fraudulent debit cards.

Reverse shipping or Caching: Merchandise leaves the shipping dock either as product returns or trans-shipments to other stores. Caching involves staging the merchandise in an accessible area for future removal.

If a store is large enough to have a loss prevention department, your prospective client will start listening now. All of these schemes are very sophisticated and difficult to prosecute. Consider a major department store that has an RFID Anti-theft system, a sophisticated Point-of-Sale system, a Video Surveillance system, and an IT support person to keep all this stuff running.

Integrating the POS System with Video

All of the above schemes hide internal theft inside of an apparently normal business practice. Losses will be detected pretty rapidly by the accounting department but it will be difficult to pin-point the source unless the thief slips up or tries it too often.

POS integration is the first step in solving this problem. The Milestone Transact product combines Point-of-Sale data with stored video on each transaction. If you suspect a cashier of using the Hidden Scan technique, simply compare the register tape to the video of the transaction. If the video camera has been well placed, his goose is cooked!

Integration with Analytics

The new field of Video Analytics is one of the most exciting developments since video went digital. The problem with all of the solutions above is the shear amount of data. It is not uncommon for a large store to have 50 or more cameras. It is nearly impossible to keep track of all cameras at once, so some intelligence is needed to filter out extraneous data.
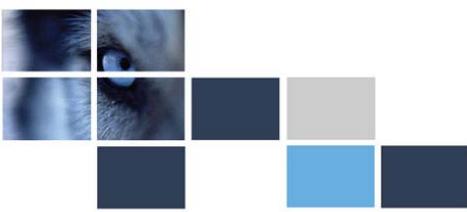
The recently announced Milestone XProtect Analytics Framework opens the door to some truly effective shrinkage counter-measures. Many interesting applications are already feasible using add-on modules that already exist. Some of the activities we may be able to detect:

- Loitering too long in a given area
- People tracking that 'hands off' to another camera when the subject moves
- Congestion at the check-out stands
- Hidden scans
- Incorrect shelving of product

Get into the Game!

It won't be many years before these 'advanced' techniques become standard practice and then we'll be working on other innovations that we can only dream of today. But one thing is for sure: You are not going to get there on that embedded DVR and analog cameras that most stores currently have. Video Surveillance systems aren't just getting better – they are getting smarter. Once you show a Loss Prevention officer how the Milestone XProtect software is truly effective against shrinkage and internal theft, the cost justification will be easy.