



# Fraud Loss Prevention for Retail Banks

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# Abstract

3VR's Searchable Surveillance System™ is the first video surveillance system designed to address the management, investigation, and fraud challenges facing today's banks. In addition to the full range of enterprise video and IT management features that banks require, 3VR's system includes SmartSearch™, a patented Event Search Engine bringing Google-style efficiency and ease-of-use to investigations, and CrimeGuard™, the only banking security solution that recognizes and stops fraudsters and criminals.

Fraud is the largest and most expensive security challenge facing banks today. Collectively, U.S. banks lose \$5 billion a year to check fraud, which breaks down to \$100,000 a year in losses for every branch in the country. The Chief of Financial Crimes for the US Secret Service calls check fraud "the single greatest threat to our financial system." All of which makes fraud reduction the best way for security managers to gain a rapid return on investments in video systems.

The capabilities enabled by the 3VR system result in a rapid and meaningful ROI by:

- ❖ *reducing operational costs,*
- ❖ *improving investigative efficiency,*
- ❖ *and stopping costly fraud losses.*

Not only does check fraud come with financial losses and customer satisfaction problems, it is quickly becoming a matter of national security. Easier to pull off than a bank robbery, fraud has become a popular fundraising method for terrorist groups and organized crime, prompting the federal government to include a "Know Your Customer" clause for banks in the U.S Patriot Act that requires stricter fraud prevention measures.

This paper will discuss the challenges involved in securing financial institutions, and how the 3VR system can be deployed to prevent fraud.

# Today's Fraud Mission

Retail banks have been battling money launderers, identity thieves and crooked brokers for the better part of the last century. Fraud and thievery are nothing new. What is new are the motivations of the groups who now perpetrate these crimes. From Al-Qaeda to the Russian Mob, these are no longer the innocent days of chasing two-bit thieves for a few forged checks; today, multiple individuals, multiple identities, and multiple channels of business conspire to commit crimes that fund international crime, drugs and terror.

Banks have had a head start in managing this challenge, but the number of individuals and methods for committing fraud is growing at an exponential rate, taxing the risk missions at even the largest banks. Effective fraud prevention requires real-time alerting capabilities, backed by databases of identities and accurate views of activity across long periods of time and geographically distributed branches.

Information must be shared between branches and organizations to prevent repeat offenders. When an incident does occur, investigators must be able to go beyond a single identity, which may appear to be clean, to uncover any links to nefarious individuals, groups or governments.

Business and market efficiency requires banks to provide their customers with immediate access to services. There is no time for slow verification procedures. This means that banks have to operate under a fair amount of trust in their customers. This trust creates gaps that fraudsters relentlessly exploit. Combating fraud activity requires a solution that maintains the openness required to perform business, while covertly identifying key threats and enabling immediate notification.

***"Fraud is the single greatest threat to our financial system."***

***- Chief of Financial Crimes  
US Secret Service***

# Smart Surveillance Prevents Fraud

Imagine a typical fraud incident in the average U.S. bank, equipped with standard security equipment, including the latest DVRs and maybe even a few video analytics:

A known fraudster walks into the bank, the third bank they've hit this week. Perhaps he or she behaves strangely, but the teller, trained to provide quality customer service, ignores their gut instinct and is courteous and helpful to the customer. The fraudster leaves with a wallet full of cash.



AlertViewer™

60 days later, the customer whose account that fraudster was stealing from notifies the bank that unusual account activity occurred on a specific date. The bank hands the case over to an investigator who is working on several other cases. It takes the investigator three weeks to comb through several hours of video from various cameras to find the perpetrator. By this time the criminal has hit several more branches.

With 3VR's CrimeGuard™ application the fraudster's face, loaded into the system's database as a known criminal, triggers an immediate alert on the system's patented AlertViewer™ console. An alert review pops up on the computer monitors of the teller and bank manager with the alert sound of their choosing (a bell, a song, etc.), not unlike an instant messaging window. A quick visual assessment eliminates false alarm concerns. Bank personnel can choose to make a polite excuse (e.g., the system is down, or this check needs X days to clear) or call the authorities.

The fraud is prevented and information about the perpetrator and incident is shared with every other branch related to the system to prevent him/her from attempting the same crime at another branch.

Given the same situation, with a fraudster unknown to the system, a fraud investigator could use 3VR's SmartSearch™ function to sift through the same amount of video and find their suspect in seconds as opposed to minutes, limiting the time required to close the case and increasing the probability of preventing further fraud at other bank branches.

# Searchable Surveillance Systems™

With the 3VR Searchable Surveillance System™, four key elements are working together to prevent fraud:

- ❖ *Next Generation DVR - SmartVideo™ delivers the highest quality video with optimized storage and bandwidth, while SmartManager™ provides best-in-class enterprise management to reduce downtime and maintenance costs.*
- ❖ *SmartSearch™ – 3VR's patented Event Search Engine brings Google-like efficiency and ease-of-use to investigations.*
- ❖ *CrimeGuard™ - 3VR's award-winning anti-fraud application uses video, search, and facial recognition to stop fraudsters and criminals.*
- ❖ *Platform for the Future – SmartFusion™ is an integration platform that meets today's requirements and anticipates tomorrow's with support for hybrid camera configurations, software and analytic updates, and data integration with teller/ATM, access control, and other systems.*

# Next Generation DVR

## SmartVideo™ and SmartManager™

3VR Searchable Surveillance Systems™ replace outdated VCRs or DVRs with the best-in-class video and system management features required by modern security buyers. 3VR's SmartVideo management suite ensures the highest standards for video recording and storage, automatically compressing video to reduce bandwidth requirements while producing high quality images for use as evidence.

SmartManager includes a trio of enterprise-level management applications - HealthManager™, which centrally monitors system health and reduces downtime and maintenance costs; SystemManager™, which centrally manages networked systems, software, and configurations, streamlining maintenance and upgrades; and CaseManager™, a scalable system that organizes, retrieves, and permanently archives case data to streamline case and investigation management.

- ❖ **Leverage highest quality video** with variable frame rates (up to 30fps per channel) and maximized resolutions (up to 4CIF).
- ❖ **Optimize storage and network bandwidth** with the leading video compression standard (H.264/MPEG-4 Part 10) and a revolutionary model for centralizing lightweight key frames and metadata.
- ❖ **Reduce downtime and maintenance costs** with Health Manager™ and System Manager™, enterprise-level management applications that centrally manage system health.
- ❖ **Streamline case and investigation management** with CaseManager™, an investigation management tool that configures, retrieves and permanently archives case data.



# SmartSearch™



Search Results

As important as analytics have been in using video to combat fraud, they would be of limited investigative value without simultaneous advances in search engine technology. Google has used search to make the eight billion pages of the Internet searchable and useful.

SmartSearch™, 3VR's patented Event Search Engine, leverages the same types of technology to make investigative searches as easy and efficient as using Google. SmartSearch™ enables rapid, accurate searches for particular events, transactions, or people, and intelligently selects

thumbnail results to populate the EventStoryboard™, a revolutionary visual interface that allows users to efficiently scan and bookmark key results.

3VR has also made it possible to run analysis and conduct searches against imported data. This means that watchlists can be imported and shared, which is crucial to both the detection and deterrence of fraud, and investigations of fraud across multiple branches.

Of course, evidence isn't worth much if it is comprised of fuzzy images, which is why 3VR's SmartSearch engine includes FaceOptimizer™, a unique application that intelligently compresses video to retain high quality face images while reducing storage needs.

- ❖ **Gather video and transaction evidence more efficiently** using EventSearch™ to instantly query for and compile relevant surveillance events from branch cameras and transactions from network servers and ATMs.
- ❖ **Review evidence more efficiently** using EventStoryboard™ to efficiently scan summaries of intelligently selected thumbnails in an easy-to-use storyboard.
- ❖ **Leverage highest quality evidence** with FaceOptimizer™, which intelligently selects and then compresses video to retain the highest quality face images.

# CrimeGuard™



SimilaritySearch™

To combat fraud loss, 3VR offers CrimeGuard™, the first banking security solution to integrate face recognition with video search to automatically detect and disrupt fraud attempts.

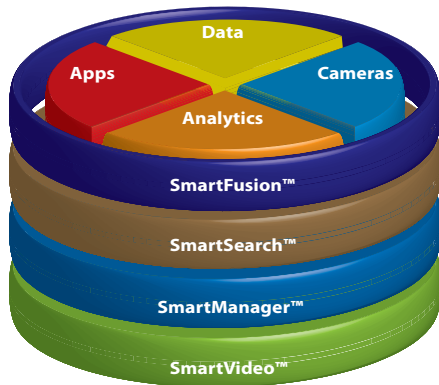
Studies show that the majority of fraud criminals are habitual offenders who escape detection by moving between branches and using different names and accounts. DVRs only link transactions by account, preventing investigators from tracking a suspect's activity. When a crime has been perpetrated against a branch with a 3VR system,

however, the criminal's face and profile are flagged and they are listed on an alert watchlist that the system automatically checks every face against. SimilaritySearch™, one of 3VR's most important innovations, allows users to search and set alerts not just for exact face matches, but for similar people. Consequently, when a fraudster tries to hit multiple branches using various disguises, their face will still trigger a Face SimilarityAlert™ on the 3VR system.

Using PeopleShare™, with the click of a button an investigator or user can distribute a suspect's face to watchlists within every regional branch. When a fraudster attempts a future transaction, the 3VR system automatically recognizes the face from the watchlist and triggers a real-time alert to stop the transaction. By eliminating the loss, the investigation, and future losses, 3VR returns real money to a branch's bottom line.

- ❖ **Solve complex investigations not feasible with DVRs** using SimilaritySearch™, a breakthrough combining event search and face recognition to track a suspect's face across time and branches.
- ❖ **Detect, deter, and disrupt fraud attempts** with Face SimilarityAlerts™, an application that enables real-time recognition and alerts for the presence of watchlist fraud suspects.
- ❖ **Seamlessly share suspect information** with PeopleShare™ and single-click distribution of images, IDs, and alerts across branches.

# Platform for the Future



3VR's SmartFusion™ platform meets today's technical requirements and anticipates tomorrow's, enabling seamless migration and simple software upgrades. The system supports hybrid camera configurations, incorporating analog, IP, megapixel and USB cameras all in the same appliance. In addition to broadening user's camera choices, this flexibility eliminates the cost of encoders or decoders required by other systems to integrate new camera types. This flexibility also supports the integration of new analytics and software as it becomes available, making upgrades inexpensive and straightforward, and the system's

API ensures seamless integration with IT systems.

Though the 3VR platform is open to new cameras and upgrades, it is tightly locked against physical and IT security breaches. The system is built around a well known, controlled operating system, it includes no unproven end-user modifications or upgrades, and it restricts network services and ports to the few required to run 3VR's applications.

The applications that run off of the SmartFusion™ platform (CrimeGuard™, SmartSearch™, etc.) are fully embedded, and the system is closed to any additional, unnecessary applications that might create network vulnerabilities. In other words, there's no threat of a viral attack via the Internet because the platform doesn't include a browser or email client.

3VR's stress tested, fully certified hardware is based on industry standards (Intel architecture, XPe, MySQL), and manufactured in the same ISO-9000 approved facilities as a high-end IT server.

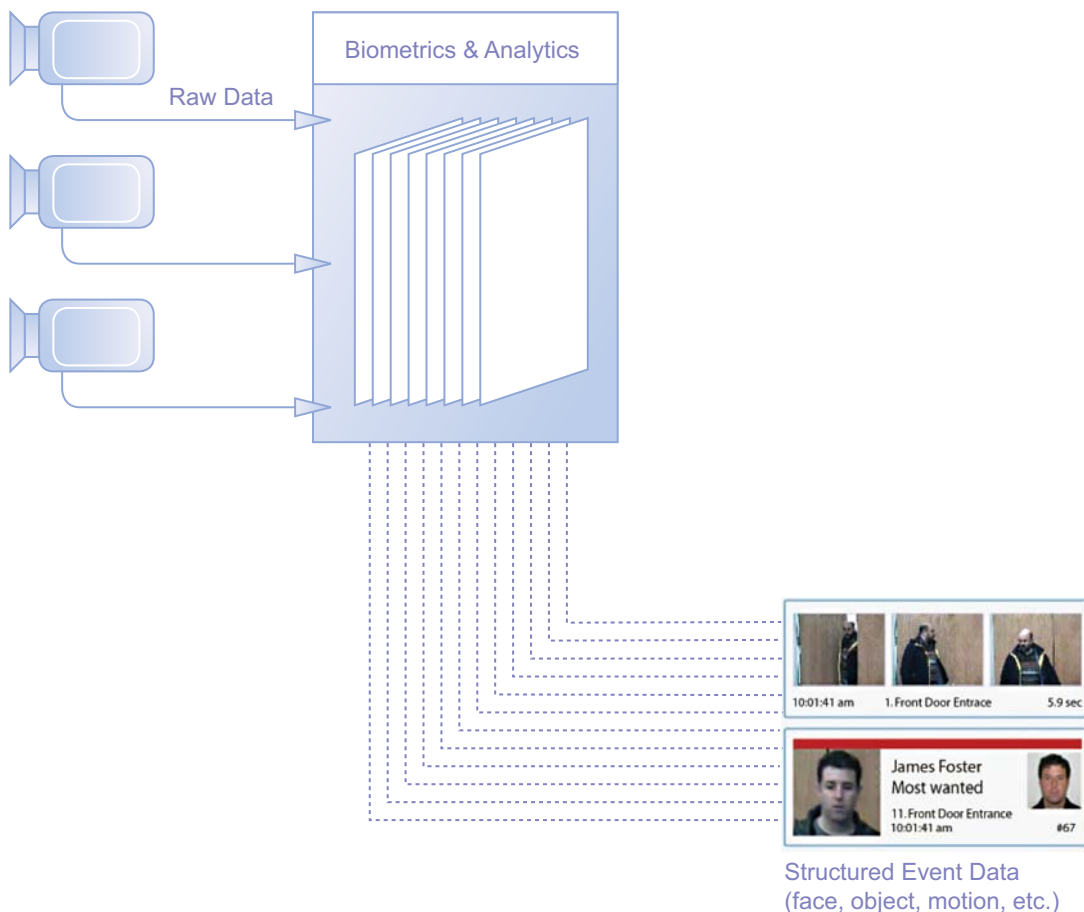
- ✦ **Future-proof your security strategy** with SmartFusion™, 3VR's platform for integrating and supporting hybrid camera configurations (IP, analog, megapixel, USB, and PTZ cameras), external IT systems, and emerging analytics and applications.
- ✦ **Secure your security system** with 3VR's highly secure, manageable appliances that incorporate a well-known, controlled operating system and a fully embedded application.

## How It Works: Architecture

The 3VR software consists of an analysis pipeline that all data is passed through on its way to storage on hard disk. The pipeline takes the data (video, images, signals from other sensors, transactional text, etc.) and creates metadata (information about what is happening in the environment) from it. This metadata describes events, ranging from simple motion events (“motion occurred on camera 45 at 3:34pm on February 3, 2006 for 34 seconds”) and face events (“John Smith exited the building”) to more complex events enabled by more complex underlying analysis. Objects appear, move, and disappear. John Smith met with Jay Grove last week. A silver vehicle with license plate 3AHL200 entered the parking lot.

Each event is tied to the video captured around that time and place and entered into the event database. All of this information enables a variety of alerts - for specific people, actions, or the movement of specific objects.

Metadata also enables SmartSearch™. Investigators can search a vast database of video and image information to find specific people or events in seconds. And, once information is stored and alerts and watch lists are created, 3VR’s unique PeopleShare™ function allows branches to share information amongst themselves, thus limiting repeat fraud attempts.



## How It Works: SmartFusion™

Built from the ground up to address today's security mission, 3VR's Searchable Surveillance System™ is designed around a patented SmartFusion™ platform that seamlessly integrates analytics, applications, data, and services. With these crucial tools working together, 3VR provides effective protection on several fronts, while reducing operational costs and headaches. In addition to expanded capabilities, the 3VR platform is scalable and flexible to make growth and updates as simple as possible.

### Understanding Face Recognition Biometrics

3VR systems feature visual, even-driven user interfaces. The visual interface is populated by a variety of analytics working simultaneously together to structure data and present it on the monitoring panel.

Bank personnel and investigators can run facial recognition, motion detection, tripwires, access control, and object detection all from one system and, because 3VR analytics are platform-based, when new technology becomes available, the analytics can be upgraded just as easily as the operating system on a standard PC.



*Event Storyboard*

The 3VR system compares every face it sees to a regional watchlist of fraudsters, and either triggers an alert or stores the mugshot in a database. All this happens in seconds.

Historically, biometrics have been associated with very expensive, limited government and military applications that often ended in failure. Advances in search and computing technology have enabled 3VR to transform biometrics into a cost-effective, practical tool that fraud and security managers can use to covertly and continuously monitor activity. In the past, biometrics required subjects to actively present themselves and wait for the system to analyze them. Today, 3VR can covertly and passively check any and all subjects as they pass by and conduct their activities without any awareness of the biometrics employed.

3VR has also made it possible to run analysis on imported data. This means that watchlists can be imported and shared, which is incredibly useful in both the detection and deterrence of fraud, and investigations of fraud.

In addition to importing images for watchlists, 3VR systems integrate easily with ATMs, transactional data systems, access control systems, and any other external data or IT systems. This allows investigators to search for suspects via transaction numbers or account numbers, and to track suspicious activity across various data sources.

All of these analytics working together make it possible for investigators to run rapid, accurate searches using a variety of parameters on an enormous amount of video data.

## Real Customer Test Results

A major nation-wide bank is currently testing the 3VR system throughout their branches in Los Angeles, a city that is known as a hot-bed for fraud, with the following results:

Metric	Results
Matching Accuracy	94%
Nuisance Alert Rate	.03%
Number of Sites	15
Total Faces Analyzed	104,542

## Conclusion

There is no magical end to economic crime in sight. Retail banks must concentrate on leveraging new identification technologies to ferret out threatening individuals and organizations, and stop fraud before it happens. Investigators must leave the old notion of what constitutes a 360-degree identity behind and embrace the next generation of identity, which goes beyond 360-degrees to include analysis of links between identities and events.

With 3VR Searchable Surveillance Systems™, retail banks extend the capability of their anti-fraud processes to:

- ❖ *See through an individual attempt to mask identity;*
- ❖ *Link a seemingly benign single customer to a nefarious individual, organization, or foreign government;*
- ❖ *Share and cross reference customer data stores with external data sources and federal watch lists.*

Improving their awareness and understanding of potential threats to this level, retail banks will find themselves well armed to confront and manage the booming fraud industry.

## About 3VR Security, Inc.

3VR Security, Inc. is the creator of the Searchable Surveillance System™, which integrates a best-in-class DVR with the most effective search, intelligence, and crime-fighting tools to enable fast, comprehensive investigations and theft and fraud prevention. Backed by leading venture investors (Kleiner Perkins and VantagePoint) as well as the U.S. government's intelligence investment arm In-Q-Tel, 3VR is the first company to provide the complete range of analysis required by today's security professionals in one system.

A single, affordable appliance that supports industry-leading hardware and storage options, the 3VR system has been recognized as the best digital video surveillance system by the Security Industry Association and Frost & Sullivan. In addition to a variety of government installations, 3VR systems are the first such products to gain real traction in the commercial market; the system is deployed at top national banks, several Fortune 500 companies, national retail chains, and world-renowned hotels.

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