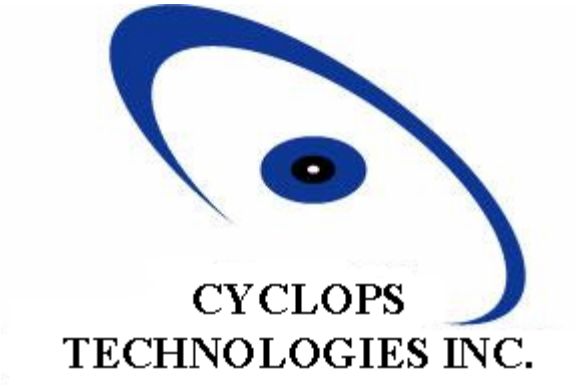

Video Analytics: Fulfilling The Promise

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Executive Summary

Video Content Analytics, also known as Video Analytics, is the process of automatically analyzing video and extracting data. The data extracted can include faces, gestures, numbers of people, text, and a variety of other information. Although in development for several decades, Video Analytics did not truly begin to emerge as a technology until the early years of the 21st Century, beginning around 2004.

Despite a ten-year period of growth, however, Video Analytics has not delivered on what was initially thought to be great promise. There are numerous reasons for this, including high cost, lack of standardization, and the underperformance of the existing technology. Additionally, the growth of Video Analytics has been hampered by the piecemeal approach the industry has taken to its advancement. Many different manufacturers work on different "pieces" of the puzzle, such as facial recognition, object recognition, or motion tracking, but few work together to create integrated turnkey solutions. Additionally, Video Analytics at its inception did not include License Plate Recognition (LPR) as one of its data streams, despite the technology's success as a source of mission-critical actionable information. All of these factors add up to a technology that is not as widely embraced as industry experts originally anticipated.

The purpose of this white paper is to explore the current state of video analytics and to suggest a new course for its development—a course that, if followed, will lead to a more rapid acceptance of the technology and steady growth of the industry.

What is Video Analytics?

Simply put, Video Analytics, also known as Video Content Analytics or VCA, is the process by which a computer automatically recognizes and extracts data from a piece of video. VCA systems are designed to detect a variety of data points, such as the number of people in an image, a particular face, a gesture, or even a heat signature. As with any other technology, the capabilities of video analytics have improved over the years; however, its limited penetration in the marketplace shows that there is still room for improvement.

An Unfulfilled Promise

From approximately 2004 on, Video Analytics has been hailed as the security industry's "next big thing." As early as 2006, some industry analysts were predicting IP cameras with fully integrated video analytic capabilities that would include behavior detection, counting people, sounding alarms, and other sophisticated analytic functions. Eight years later, such

products have yet to materialize. Moreover, the specialized analytic technologies that do exist in the marketplace have not fared as well as the experts had hoped. Many early adopters of Video Analytics discontinued their use after short periods of time, the technology having failed to produce the results they sought.

The underperformance of many video analytics systems goes hand in hand with one of the key challenges that the industry faces; namely, a lack of official standards. Because industry players cannot even agree on definitions for much of the terminology they deal with, and because no procedures or standards have been defined for measuring product performance, buyers of video analytic technology have had to rely largely on manufacturers' claims regarding the effectiveness of their products. Such claims, while not necessarily false, were often based on the results of tests conducted under conditions that bore no resemblance to real-world scenarios. In practice, many early users encountered a high number of situations where the system either missed an incident it should have issued an alert on, or produced false alerts.

Furthermore, there was—and still is—an overwhelming variety of specialized analytics products available; i.e., some do facial recognition, others do gesture recognition, others do thermal image capture, and so on. The effort to combine these technologies into integrated solutions has been slow and halting at best. In this situation, experts have often advised prospective buyers to choose the "best of breed" in each analytic category; however, determining just what that means has been challenging at best. Because most Video Analytics technology continues to carry a high price tag, and because the available products are difficult not only to integrate but also to judge as to quality, it is no surprise that so many potential adopters choose to watch from the sidelines.

A Sea Change

At the same time that Video Analytics was emerging in the marketplace, another form of computer-based object recognition was making its way from its birthplace in Europe to the shores of North America. This technology, called License Plate Recognition (LPR), allowed law enforcement to automatically "read" the license plate numbers of vehicles that passed in front of a video camera and instantly compare them to databases for active wants or warrants. LPR had had a great deal of success in Europe, where license plates were largely standardized; however, the technology had a rude awakening in the United States when it encountered the bewildering array of colors, fonts, and layouts present on American license plates.

The European technology's inaccuracy reading North American plates was only one issue. The systems were also incredibly expensive, owing to their need for specially designed cameras and dedicated processing hardware. They also could not recognize state jurisdictions, which was a major bone of contention with American police departments.

With the 2012 debut of Cyclops Technologies' Software-Only License Plate Recognition solutions, the industry began to turn a corner on the aforementioned issues. The first release was a mobile LPR solution, designed primarily for law enforcement, dubbed PlateSmart. Independent third-party testing showed that PlateSmart's recognition engine read American license plates correctly at least 90 percent of the time and could recognize all 50 state jurisidictions, a significant improvement over competing systems. Also, the system was camera-agnostic, allowing it to function with a broad range of IP video cameras, even inexpensive off-the-shelf models, and required no dedicated processing hardware to function. Out of the gate, Cyclops had overcome the issues of cost and accuracy that plagued the LPR market.

Following the success of PlateSmart, Cyclops developed and released ARES, its LPR-based Video Analytics software. ARES combines license plate data extraction with state-of-the-art analytic tools for applications such as pattern recognition, vehicle counts, time in and out, and more. Based on the same recognition engine as the PlateSmart software, ARES delivers the same LPR accuracy as its mobile counterpart in addition to analytic capabilities never before available in an LPR-based product. With the introduction of ARES, video analytics is starting to fulfill some of its promise. Previous video surveillance technology was limited to simple record-and-playback functionality with some time stamps; the vast number of triggers it generated required a great deal of human intervention to analyze that video when needed for forensic evidence. ARES automatically captures and indexes events based on license plate captures, then allows data mining to find significant events or patterns with just a few mouse clicks. Being software-only, ARES can integrate smoothly with Video Management Systems, a fact that has gained Cyclops ongoing integration partnerships with Pelco, OnSSI, Exacq, and the opportunity to partner with Milestone, the largest VMS maker in the business. ARES can turn any camera connected to these systems into an LPR/analytic camera.

The Next Step

With its eye on the larger analytics market; that is, the market beyond LPR, Cyclops is currently engaged in the development of the next generation of ARES, an engine more powerful than any data analytics engine on the market that will dramatically expand on the

original software's data acquisition capabilities. Added to the mix will be facial capture, thermal imaging capture, and camera association functionality, as well as importation and integration of third-party data. Future versions will see even more capture capabilities. The greatly enhanced ARES engine will join LPR with video analytics to produce a stream of actionable data in real time.

The next generation of ARES will also take all of these new capabilities to the cloud, offering the power of Cyclops' object recognition engine and full feature analytics in a Software-as-a-Service (SaaS) model. Users will not have to install any software on their end and will pay on a per-click basis, thus providing them the intelligence the need with a massive savings of money and bandwidth. If desired, users will also be able to purchase a software license outright.

Future generations of Cyclops Technologies' ARES software will also see expanded analytic capabilities, making ARES one of the most comprehensive video data intelligence analytics tools for security organizations, businesses, or practically any other client in need of mission-critical actionable data in real time. For many organizations, this kind of software-only, hardware-agnostic video analytics solution will be the only viable option, whether for cost reasons or for ease of use. We submit that this model is the best roadmap to the future. The addition of Cyclops' technology will help the Video Analytics industry to fulfill its original promise.