

SA schools introduce CCTV to help combat high levels of violence

The levels of violence in South African schools are significantly higher than in countries such as the United States.

So say the findings of a ground-breaking study conducted by **Patrick Burton**, director of research at the Centre for Justice and Crime Prevention (CJCP), and released in April 2008. The National Schools Violence Study (NSVS) also found that 15,3 per cent of primary or secondary school learners have experienced some form of violence while at school with the number rising "significantly" if non-violent crimes such as property theft are considered. It's not surprising then, that some schools have recently taken unprecedented steps such as installing CCTV (closed circuit television) on their premises to safeguard pupils, teachers and property.

In view of the "alarmingly high percentage of learners who report access to weapons at school", Mr Burton believes it is time for "comprehensive action" on the part of the Department of Education. He says further that: "While situational prevention or 'target hardening' (that is, increasing security around a school, including security fencing, security gates, alarm systems, security guarding and metal detectors) do not at any level address the causes of violence within school, they do make it harder for learners to bring weapons to school, and by doing so address the intensity of the violence that occurs within the school environment."

Acknowledging the need for improved school security in his area, Western Cape Education MEC **Cameron Dugmore** referred to a "focused and intensified Safe Schools Project" in his budget speech (May 22, 2008). The project, he said, would allow for the introduction of a set of deliberate measures in targeted high-risk schools in the province (109 schools) with a budget of R14,9 million. These security measures would include CCTV installations at 60 high-risk schools.

Bearing in mind the controversy that continues to rage worldwide around privacy issues, and the efficacy of CCTV as a crime deterrent, *Security Focus* spoke to some of the leading players in the local industry about the latest technology, trends and results.

MOST DANGEROUS

In a letter titled "Visual security at schools: combating crime to protect children", to Education South Africa, **Bernard Senekal**, managing director of Sentronics, starts off by saying that South African schools are rated as the most dangerous in the world.

"This comes from an assessment by the South African Institute of Race Relations, which further found that only 23 per cent of learners feel safe at school," says the man whose company recently supplied 60 recording and camera systems to schools in the Western Cape.



Ingrid Smit
Special correspondent

"The idea with the Safe Schools Project was to implement local recording systems at the identified schools, which could be linked back to a control room environment in order to allow for centralised monitoring and management," he explains. And though it's still "early days", reports are positive. "The kids are aware they are being watched and criminal activities, such as drug dealing just outside school perimeters, have decreased. One example is the closure of a TIK dealing house just a block away from one of the schools after suspicious activities were recorded by its CCTV system. Another school's system captured two children throwing another one down the stairs."

He continues: "Sadly, schools have become a platform for many types of criminal activities. Learners and teachers are repeatedly targeted on school grounds and in classes by the criminally inclined. They have become 'soft targets' and their weaknesses exploited easily, hence the need for us to up the levels of security in schools."

According to Mr Senekal, crimes being committed at schools run the gamut from abuse, vandalism and stealing to bullying and gender violence. To this he adds ongoing incidences of crimes involving firearms and other weapons, and organised crime such as drug dealing and gangsterism.

As a result, he's a firm supporter of initiatives such as those by the Western Cape Schools Educational Department's Safe Schools Programme, whose strategy includes the installation of security systems at schools, while also addressing the social environment by influencing learner behaviour and working with schools to mobilise community support. "This is a powerful start to addressing the missing link between schools, the police and the community," he maintains, describing the rolling out of electronic security equipment such as CCTV on the perimeter, and in classrooms and passageways, as a critical first phase. "The creation of a 'Big Brother' presence is vital to raising awareness among would-be criminals, who know they are being watched. This in turn reinstates the confidence of learners and teachers because of its ability to deter or reduce crime."

Once the first phase is up and running, he says the intention is to implement a second phase which will address the need to visually confirm and thereby dynamically manage critical situations that occur on an *ad hoc* basis. This will be done by linking the cameras and recording devices at schools to a central control room managed by a third party or possibly even the education bodies themselves. "This system will directly

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complement the integrated prevention, crime control, intervention and response strategy which is now part of the Safe Schools Programme," says Mr Senekal.

After the first and second phases have been successfully implemented, the plan is to launch the third phase which will integrate existing or future electronic devices such as alarm systems, security doors and safety gates. "The recording platform forms the heart of the system and controlling or triggering the attached and integrated devices based on a set of rules or manually from the control room based on visual verification of a specific incident. If all these resources, procedures and technologies are complementing each other as far as the cross dependencies that exist among them, then you end up with a system that not only proves itself as the ultimate crime combating tool, but also sends a message to the community that says we are no longer going to allow the "tail to wag the dog," he explains.

Global CCTV snippets

CCTV may well become a vital tool in the battle to catch school cheats if the British Examination Officers' Association (EOA) has its way. In his article which appeared in the Liverpool Echo on May 3, 2008, Ben Turner writes that the EOA, which is responsible for patrolling and monitoring most of the exam halls in the UK, has come out in favour of CCTV after more than 4 000 secondary education students in the UK were caught cheating last year.

CCTV could also find a home on school buses, according to an article in the Hamilton Advertiser (July 3, 2008). Journalist Graham Fraser tells of four schools in South Lanarkshire in the UK, which have decided to install CCTV on their school buses in an attempt to enhance the safety of their child occupants.

And last but not least, the Engineering and Physical Sciences Research Council (EPSRC) is funding research at the University of Portsmouth in the UK that will allow CCTV to capture events by sound as well as visuals. According to the university's news page (www.port.ac.uk, Jun 23, 2008) sounds such as breaking glass, shouting or the noise of a crowd gathering are being "learned" by artificial intelligence software. The hoped-for end result is that this technology will revolutionise the speed with which crimes are caught on camera and responded to by police.

Further to this, the intention of the three-year project is to adapt artificial intelligence software already being developed by researchers at the University's Institute of Industrial Research to identify visual patterns. According to the article, the software is already so sophisticated that it can identify minor visual cues such as whether a car aerial is up or if the car has a dent on it as well as more complex cues such as violent behaviour... By the end of the three-year programme, the researchers hope to have generated algorithms that can be used inside existing CCTV software. And because the system is underpinned by artificial intelligence, each successive generation of algorithms would become more sophisticated as they "learn" what they are looking and listening out for.

TRENDS

"CCTV as a surveillance tool has reached a mature stage with the developments now being made in 'value-adds' such as text overlay on video from point-of-sale and/or access control systems," says **Brian Wynberger**, senior product specialist for Regal Security. The technology is working successfully in fields such as video fire detection, where advantages include a quicker detection process and increased coverage range, owing to the camera's field of view now being able to cover a fairly large area.

The reduction in the cost of broadband is giving rise to growing demand for the remote access monitoring features now offered by most DVR (digital video recording) systems, he adds. Customers with both large and small applications are demanding advanced monitoring systems for more secure and effective remote surveillance, including real-time transmission, says Mr Wynberger. The emergence of other technologies, such as facial recognition, licence plate recognition, behavioural recognition and auto-tracking are also becoming prevalent. "IP (Internet protocol) surveillance systems continue to make slow but definite inroads into the mainstream CCTV market, and digital video monitoring management, used to link disparate security subsystems, is also gaining momentum."

Commenting on where CCTV is today, **Michelle Korff**, marketing manager for Norbain, says the technology is now so sophisticated that night vision, computer-assisted operation and motion detection facilities are a reality. So are DVR back-ups and IP surveillance, the latter of which has been on a steady growth incline for the past few years and is still accelerating. "Predictions are that IP surveillance sales figures will overtake that of CCTV by the year 2011, largely due to the advanced functionality and easy integration of IP surveillance," she says. "Camera intelligence has advanced to the point that cameras will activate once an alarm has been activated. Further, built-in electrical switching allows IP cameras to be wired into alarm systems and electrical gates, thereby allowing for activation from remote locations."

Ms Korff adds: "What's also important is that audio can now be captured by the camera itself, synchronised with the video and integrated into the same video stream. All these developments are ensuring higher security levels, vastly superior image quality and lower total ownership costs. There are also other notable improvements in the field of CCTV, such as Internet Protocol (IP) cameras which are run on an established, standardised and inter-operable network infrastructure; digital images that are not vulnerable to any reduction in image quality typically associated with analogue; integration with other systems can be easily accommodated when standard protocols are adopted; and real-time information can be made available for remote sites across the globe to multiple users. Added to this are digital video's advantages with regard to storage and accessing historical footage without holding or managing tapes."

The proliferation of the network or IP (Internet Protocol) camera is the best thing that's happened to the video surveillance industry, believes **Roy Alves**, country manager for Axis Communications. He supports this by saying: "Network cameras and megapixel technology have drastically enhanced the image quality that would typically be achieved from video surveillance systems. In addition, the network camera has brought other benefits such as monitoring through the Internet to the point that it's emerged as the preferred surveillance solution in recent years."

Attributing its growing popularity as the direct result of people's

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reaction to terrorist threats and rising criminal activity, he says video surveillance is used today in almost all industries in South Africa and the rest of the world. "These include the banking sector, manufacturing, the hotel industry, mining and the transport industry, among others," he notes, adding that the Gautrain is set to have one of the most advanced video surveillance systems in the South African public transport sector.

CHALLENGES AND SOLUTIONS

For Brian Wynberger, one of the biggest problems with CCTV at the moment is the failure of users to implement surveillance systems as a management tool. "There's often a gap between the technology's capabilities and its implementation, which results in under-utilised surveillance systems that in certain cases become white elephants," he says, though he adds that users, as they become more aware of surveillance system capabilities, are insisting on installers or system integrators implementing these "value-add" features.

"Installers who are comfortable with analogue camera technology are often presented with a steep learning curve when faced with having to put in an IP surveillance system," he continues. "The most obvious way to overcome this challenge is for installers to learn this new technology themselves, although this isn't always what happens. Other installers tend to outsource the function to knowledgeable third parties, at an additional installation cost. What's also helping is that

some manufacturers have come to the party with easy-to-implement IP surveillance solutions. Regal's camera supplier, GKB Taiwan, has designed a solution which allows for almost effortless implementation of this technology."

Adds Mr Alves: "The name 'closed circuit television' is descriptive of one of the major shortcomings of legacy or dated CCTV systems because the very nature of their analogue basis limits them in terms of their accessibility. To access the system, one needs to physically be at the given location because remote access is not an option."

Another major problem with analogue systems is storage. "Footage in analogue systems is stored on video cassettes which take up a lot of physical space and are not that reliable as a storage medium because of their limited durability," he explains. "A further and major drawback with legacy CCTV, he notes, is the lack of flexibility with regard to integrating with other IP systems since CCTV systems are generally made up of proprietary hardware that cannot be integrated with equipment from other vendors.

He's quick to point out modern-day solutions. These include the digitisation of surveillance systems and the introduction of network cameras with built-in Internet browsers. "Operators are now able to access the surveillance network from anywhere where there's an Internet connection," says Mr Alves. "This allows for greater flexibility and functionality. Also, because footage on a network system is captured digitally, it can be saved on a computer hard drive, thereby saving precious office space. Take for instance Axis' installation at iBurst. The biggest challenge was the vast open plan office space that needed to be covered. With traditional analogue surveillance systems, an installation of this scale would require a large number of cameras to ensure adequate coverage. However, with the IP system that was installed at iBurst, it took only a few megapixel network cameras to cover the entire office area. Another great installation is the Ermelo street surveillance system where network cameras have been deployed to monitor the area and keep the streets safe for residents."

FASTEST GROWING INDUSTRY IN THE WORLD

CCTV is the fastest growing industry in the world, according to Ms Korff. "Keeping the 2010 Soccer World Cup in mind, there is enormous pressure on South Africa to provide the highest possible levels of video surveillance through widespread CCTV installations in the interests of safeguarding its foreign visitors. Foreigners are used to having CCTV on every street corner and will expect the same here, so there's a lot for us to do in the next couple of years."

After the World Cup, she continues, when the country should be riding the crest of the resultant economic wealth wave, it will have to focus attention on maintenance of existing installations. This demand for CCTV cameras and their resultant maintenance requirements will definitely see it becoming a growing, multi-billion rand industry, she believes.

Essentially, CCTV users comprise home users or consumers, businesses, and government, says Mr Wynberger. The home market is being driven by crime and therefore people need to enhance the safety of their families. What's also boosting take-up is that prices have dropped significantly in the last few years, making the technology affordable to this sector.

With regard to small business, he says cost-effective, integrated solutions are driving this market. "Most sought-after are applications

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that combine security with safety, management and staff productivity tools. This differs from big business, where many corporations have historically implemented CCTV technology and have been through the learning curves of the small business segment," he points out. "These companies are now seeking solutions which integrate into their total security strategy."

Then there's government, where the focus is on metropolitan systems aimed at crowd monitoring and crime prevention, he continues, the ultimate goal being to speed up response times to incidences.

THE BIG BROTHER ISSUE

Privacy advocates are anti the use of CCTV but, says Mr Alves, the privacy issue is not as much of a problem in South Africa as it is in European countries. "This is because people here are more concerned about their safety than they are about privacy. And without doubt, the latest technology is making a difference to crime. Apart from making it easier to identify perpetrators due to better image quality, surveillance cameras act as a crime deterrent. Criminals typically shy away from their intentions when they are aware that their activities are being monitored, so for as long as surveillance systems are seen to be contributing positively towards the fight against crime, they will continue to be accepted by the majority of the population."

Bear in mind too, that there are legal parameters regarding CCTV

installations in environments such as educational institutions, adds Brian Wynberger. "These are based on common law, which makes it illegal to install cameras in bathrooms and other places of privacy."

SCHOOLS

"There have been many incidents in South Africa where teachers and pupils have been threatened, injured or killed," says Ms Korff, hence her belief that schools need CCTV systems. "These systems are intended to deter thieves and vandals while simultaneously improving the physical safety of the pupils and their teachers. When criminals know the school is under the watchful eye of CCTV, they tend to be hesitant about entering the property. Making cameras visible also helps to prevent potential security problems while at the same time making staff and pupils feel safer."

Saying that CCTV is not a "silver bullet" solution, Mr Senekal supports its use in conjunction with other measures, protocols and controls so that the system becomes a tool within a total approach geared towards combating crime. "In the case of CCTV in schools, the demand was community-driven. It's become part of a total solution that includes the community being directly involved with control room monitoring, which is in turn linked directly to the closest police stations," he offers.

"Aside from deterring crime, CCTV in schools can fulfil other roles such as monitoring pupils' behaviour, protecting expensive equipment and monitoring teachers' performances," points out Mr Wynberger. The downsides, in his opinion, are that CCTV has the potential to undermine teachers' ability to work independently. Also, despite being able to cover a significantly larger observation area than a security guard would be able to do, there would still be areas in the grounds that were not covered. "Once delinquent pupils inevitably become aware of the cameras' shortfalls, they could use these areas for criminal or violent acts, which is a concern. However, the upside to this is the practice of delineating 'safe areas' where cameras cover a known area and bags or valuables can therefore be left securely."

Says Mr Wynberger further: "Based on Patrick Burton's findings, it seems imperative that measures are put into place to ensure the safety of pupils in schools. CCTV surveillance solutions provide an effective manner to counteract crime, provided they are properly monitored. The integration of video, security fencing, security gates, alarm systems, security guarding and metal detectors is the ideal solution for crime prevention, although obviously the cost involved is an inhibiting factor for many schools."

Funding for the implementation of successful security strategies has to come from somewhere – the question is where?

"Parents and government would like to see the ubiquitous reduction in crime, but the fact is that budgets and cash flow are limited. The R12m spent by the Western Cape Education Department on the 60 high risk schools reflects the severity of the problem of crime in schools in South Africa as a whole and the high cost of addressing it," comments Mr Wynberger.

Mr Senekal adds: "Some of my staff members have been to these schools and they come back almost in tears. You will not believe the challenges that a learner who wants to study has to deal with, in these environments. I think that the Western Cape's Safe Schools Project has been driven correctly in so far as they are investing in more than a security system: they are, in fact, investing in securing a brighter future for this country and its up-and-coming generations. This project, and others like it, as well as the communities behind them, should be commended for driving the message that South Africa is saying NO to crime in our schools and YES to the future of our children and our country." ■