7 in 10 citizens think police forces should use digital technology to build trust.

52% to 67% of citizens say the presence of CCTV security cameras makes them feel safer.

63% of citizens say they want local police to make more use of analytics to predict crime.

60% to 73% of citizens surveyed believe police forces should be collaborating with other government agencies.
SEIZING THE CCTV OPPORTUNITY IN PUBLIC SERVICES

Combining the power of CCTV and emerging technologies to realize the future vision of preventative policing.

The presence of close-circuit television (CCTV) cameras in public and private locations has long been a fact of life for citizens in many countries. For public safety agencies, these devices present a useful way to collect, monitor and analyze information that can help to keep the public safe and prevent and detect crime. But the reality is that their usage to date has only scratched the surface of the potential benefit they could deliver.

This is set to change. Today, rapid technological advances – both in cameras themselves and wider digital capabilities – are opening up new ways for CCTV and digital surveillance to benefit public safety. While cameras have evolved rapidly in recent years – with higher resolution, better connectivity, night vision – the underlying infrastructure and monitoring processes behind most CCTV systems have largely remained unchanged, focusing on manual monitoring and post-incident analysis.

Moped crime alert

In the future, CCTV systems could potentially detect a moped street robbery in real time, automatically alerting police with an image, description of the vehicle and number of suspects along with the direction of travel, and sharing this information instantaneously with officers nearby. Deep learning algorithms could even detect patterns in video streams and spot early warning signs that might enable officers to intervene and prevent thefts.
However, this lack of innovation is now being questioned by citizens. Accenture’s Public Service Citizen Survey 2018 shows that three in four want government technology leaders to innovate more\(^1\), and that 62% expect public service organizations to use innovative technologies and solutions to improve service delivery while driving down cost\(^2\). By using new technologies to transform the analytics and processes behind their CCTV systems, agencies can meet citizens’ rapidly increasing expectations around the responsiveness, proactivity and effectiveness.

**Accelerating the way to a more proactive and preventative future**

What’s more, using digital technologies to enhance CCTV opens up much wider opportunities. The video information from CCTV is just one part of an expanding deluge of data now coming into policing and other public safety agencies. The full power of CCTV will only be realized when it is used in combination with emerging technologies and other data sources, such as social media and sensor data, to create new insights – enabling higher levels of proactive monitoring and detection than ever before, and supporting a more preventative policing strategy.

Again, citizens are in favour of this advance: our research shows around two-thirds or more think digital technology can help deliver more effective policing and public safety, and around 7 in 10 think police forces should use digital technology to build trust\(^3\).

Most importantly, combining CCTV with real-time connectivity and advanced technologies like artificial intelligence (AI) and machine vision can enable public safety agencies to “see the unseeable”, by extracting insights and identifying patterns and actions that would be missed by humans, and then alerting officers so that they can proactively take action based on these insights. This ground-breaking capability can help agencies “pivot to the New” by entering a new era of policing: one that’s focused less on dealing with the aftermath of criminal activity, and more on using technology to enable proactive actions to prevent – or disrupt – crime before it happens. CCTV is just one building-block among many enabling this shift, but a vital one.

---

**Today, rapid technological advances – both in cameras themselves and wider digital capabilities – are opening up new ways for CCTV and digital surveillance to benefit public safety.**
CCTV TODAY: WHAT’S BLURRING THE PICTURE?

To harness the potential of CCTV to help create this future, public safety agencies first need to overcome three key issues with today’s CCTV systems.

The first is that most public safety CCTV operations remain focused on reactive processes. CCTV cameras now boast many advanced features, and the video footage they capture is usually recorded and archived – but is only subjected to analysis if warranted by reports of an incident, after the event. There’s a stark contrast with the social media sentiment monitoring conducted by many organizations – both public and private sector – which is increasingly comprehensive, AI-enabled, detailed and real-time. This means the CCTV device remains largely a “black box”, producing data that’s only pulled out from the archive for review after the event if something has happened.

The second – related – issue is that manual interventions still tend to dominate CCTV operations. A lack of automation means that most real-time monitoring and supervision of CCTV content is still carried out by teams of humans sitting in control rooms, watching content and monitoring

Automated weapon alert

High-resolution cameras using video analytics could automatically detect a weapon in any public space and alert nearby police officers.

Emergency response for a collapsed person

Pattern recognition could detect a person lying still in a public place and automatically alert the emergency services with information including description, age and gender.
A lack of automation means that most real-time monitoring and supervision of CCTV content is still carried out by teams of humans sitting in control rooms, watching content and monitoring other sources such as sound sensors, and then reporting back on what they’re seeing and hearing to determine what the public safety response should be.

The ability to transfer video evidence seamlessly between different public safety agencies and other participants in the ecosystem delivers many benefits. These include dramatic time saving and better intelligence from bringing disparate footage together. But historically CCTV information has been stored in discrete network video drives or on physical tapes or CDs, meaning sharing it is difficult, slow and highly labor-intensive. Taking a large city as an example, this issue is underlined by the sheer range of CCTV systems likely to be operating at once – owned and run not just by police, but also by local authorities and transport operators on the public service side, as well as by citizens, third-party operators and facilities management companies on the private sector side. All of these systems can produce data that could benefit public safety if shared in a controlled and permissioned way.

People are also used to conduct post-incident analysis, trawling through many hours of footage and sound recordings from different cameras and sensors to establish what happened. This approach is slow and resource-intensive, with the result that the time-lag between an incident taking place and a human accessing and reviewing the footage can be hours, but more likely days or weeks. This means the current approach is barely feasible for an agency covering a major city – and will become less so in the future, as more video sources come online from the likes of transport networks, shopping centres and citizens’ own video recordings.

The third challenge for today’s public safety CCTV systems is that their ability to share data across functions or other organizations is very limited.
As public safety agencies seek to address these three shortcomings in today’s CCTV systems, their efforts are complicated – and made more urgent – by wider developments across society. Given the general decline in trust in institutions in recent years, it’s vital that the police retain the public trust and confidence that enables them to work effectively with the communities they serve, something that greater use of CCTV could threaten if the public regards it as excessive.

However, at the same time citizens’ expectations of the public safety benefits that can be achieved and delivered through CCTV are rising rapidly, driven by Hollywood movies and their own experience of home surveillance and security systems – where features such as facial recognition are becoming mainstream.

**Constant automated vigilance for suspicious packages**

Video analytics could trigger an automatic alert if any package or bag has been left static in a public place for more than 3 minutes.

**Automated crowd “nudging” to prevent overcrowding**

Linking adaptive signs, smart lighting, pop-up barriers, e-gates, video-equipped drones and other IoT devices into the same platform as the CCTV video analytics creates the ability to automatically nudge and direct crowds to avoid unsafe bottlenecks emerging.
Again, Accenture’s Citizen Survey research illustrates the shift in public mood, finding that citizens want government to be more active in making them more secure. Around two-thirds of respondents – ranging from 63% to 74% across the six countries surveyed – think the police and law enforcement agencies should make greater use of CCTV security cameras. And the majority of citizens in each country – 52% to 67% – say the presence of CCTV security cameras makes them feel safer.

People’s growing comfort with CCTV is undoubtedly being fostered by their rise in the use of home surveillance solutions. With an expanding number of vendors having entered the marketplace, remote video-based home security is now both technically feasible and financially affordable for a rising proportion of consumers. As well as changing consumers’ expectations of CCTV, these increasingly sophisticated domestic offerings are also having two further important impacts on public attitudes to CCTV.

**Exposing blind-spots around capabilities and ethics**

First, the new generation of home security solutions are highlighting where the gaps are in many existing CCTV operations run by public safety agencies. For example, real-time video surveillance systems are now available that can use facial recognition technology to differentiate between friends and potential foes, and enable remote two-way interaction with people on the doorstep.

Second, the growing use of domestic video surveillance offerings is making citizens increasingly aware of the ethical issues that can arise around CCTV. The key concern for many is around the risk of a “surveillance state” developing – a worry that goes to the heart of the trust relationship between citizens and their government and police force.

An additional ethical and technical challenge is in “adversarial techniques” to trick or defeat machine vision. These techniques can make the technology provide erroneous results and manipulate the value gained by the use of AI. This evolution in technology will continue to inform and influence citizen perceptions of what responsible CCTV looks like in the future.

Current responses to these issues vary widely between different societies and cultures. In Germany, for example, usage of CCTV is strictly regulated. The UK, by contrast, has historically been one of the world’s most heavily-surveilled societies – but people there generally assume that most CCTV cameras are either switched off, won’t be of sufficient quality, or can’t be accessed easily by police. Singapore is different again, with citizens feeling comfortable with the use of a widespread CCTV-based facial recognition system under the city-state’s ‘Safe City’ programme.
Public safety agencies must maintain the trust and confidence of the citizens they serve

What’s clear is that the worldwide debate over “responsible CCTV” will continue to grow and evolve differently in different places – as will the usage of CCTV as a public safety tool. And in both contexts, what matters for public safety organizations is that they must keep pace both with how citizens are using video surveillance and also with how they feel about its use in the public domain. In this context, Accenture’s Citizen Survey research shows that many people trust government with their data if they see a benefit in return; half of citizens across the six countries surveyed are willing to share personal data with a public agency if they receive better service delivery as a result. Also, most citizens think the increased protection provided by security cameras outweighs any risks to privacy – except in Germany, where just under half (46%) agree this is the case.

However, other findings from our studies underline that there are limits to the extent to which citizens trust the authorities to behave in ethical ways. For example, only about one citizen in three (albeit rising to 42% in Singapore) is confident that governments’ usage of AI would be ethical and responsible. And generally, only four or five citizens in every 10 support the use of AI by government for a variety of analytical applications.

As such responses illustrate, only if the public are comfortable with how CCTV is applied will they continue to trust the agencies using it, and collaborate in helping to make it as effective as possible. We’ll now look at how this can be achieved.

The key concern for many is around the risk of a “surveillance state” developing – a worry that goes to the heart of the trust relationship between citizens and their government and police force.
THE WAY FORWARD: AI, AUTOMATION, AND SHARED CROSS-AGENCY INSIGHTS

As we’ve highlighted, most CCTV operations in public safety have stood still while citizens’ expectations have risen in line with the rapidly increasing capability of technology. So major changes are now needed if CCTV’s full potential for public safety is to be realized.

In Accenture’s view, these changes must include using digital technologies to cut across the silos that currently separate CCTV from other sources of data relevant to public safety. This lowering of barriers should also foster sharing of CCTV and other data across agencies, and encourage sharing by private individuals and other organizations of any video data that could help protect the public.

Equally importantly, agencies must make a concerted shift towards “smart surveillance” – enabling a small number of human analysts to monitor a wider range of cameras and detection sensors. This is achieved by using AI, automation, video analytics and technologies like “machine vision” to analyze video streams in superhuman detail in real-time, providing alerts and predictive insights that would be beyond the abilities of any human to see or develop.

Using analytics and AI in this way can also help public safety’s wider move towards a more preventative model – and a number of scenarios illustrating the resulting benefits are scattered around this point-of-view. Again, Accenture’s research suggests there’s strong support for such a shift, with 63% of citizens saying they want local police to make more use of analytics to predict crime. And most public safety leadership think advanced analytics/predictive modelling (61%) and biometrics (51%) are leading the way in terms of pilots and implementations, with video analytics (30%) the next most common.
A multi-stakeholder public safety data platform

CCTV video data needs to become just one element in a comprehensive range of information that’s brought together and integrated from a wide array of stakeholders in a holistic public safety platform. These platforms need to be equipped to accept and analyze data not just from multiple agencies but also from third-party organizations like transport operators, and from the public via direct sharing or social media. To do this the platforms will need to be highly agile, technology agnostic and adaptable, offering the ability to add more services easily.

A schematic of this type of collaborative platform is shown in Figure 1. Significantly, Accenture’s Citizen Survey research shows the between 60% and 73% of citizens in the six countries surveyed believe police forces should be collaborating with other government agencies.

Smart personalized home security

Linking CCTV with smart home devices such as smart locks can create smart personalized home security, enabling a citizen’s home could let in family, friends, deliveries – or even trusted neighbours if it recognizes them and they’ve granted them permission to enter while they’re away.

Connected cameras on bike helmet or car dashboard

Linking these devices into an emergency contact service means that in the event if an accident, the video footage, location and discernible witnesses or nearby vehicles could be sent immediately to the police as contextual information.

Predicting gang conflicts

Combining facial recognition with a known watch list could enable the system to alert police when automatically when two members of rival gangs come into close proximity.
Figure 1: a public safety platform incorporating CCTV
Do some housekeeping

Carry out a review to understand the current state of the CCTV system, all the way from the technology capabilities of the existing cameras to the back-end processing of images.

Use the power of AI and machine vision

Compare the capabilities of current CCTV systems with the improvements in public safety that could be achieved through advanced cameras (if not yet being used), and implementation of technologies like automation, AI and machine vision in the back-end.

Privacy and ethical responsibility is paramount

While identifying the use cases, always remaining mindful of the need not only to meet legal requirements, but also to act responsibly and be sensitive to citizens’ concerns over privacy. This is vital for “taking the public with you” and sustaining citizens’ confidence and trust.
Think platforms, not siloes

Design a scalable data platform to support collaboration and information sharing, initially emphasizing high-impact use cases that will deliver the biggest benefits to public safety, and building support, buy-in and momentum both across the organizations involved and among the public. At the same time, identify how CCTV video data can be integrated, stored and analyzed in combination with the full range of agency data.

Collaborate across the ecosystem

Reach out to other agencies, wider organizations and the public to encourage them to agree to share their video and other data on the platform, opening up opportunities to expand the available information and the benefits delivered over time.

CCTV in public safety currently presents a huge but largely untapped opportunity for public safety agencies – not only to detect crime, but to drive the advance towards a more preventative role in protecting the public. It’s time to realise its potential. The five fundamentals above can help them do it.
EXPERTS

James Slessor
Managing Director, Global Public Safety Industry
Email: james.w.slessor@accenture.com
LinkedIn: https://linkedin.com/in/jslessor
Twitter: @slesor_james

Jonathan Tipper
Digital Strategy Manager, Public Safety
Email: jonathan.l.tipper@accenture.com
LinkedIn: https://www.linkedin.com/in/jonathan-tipper-52a37648
Twitter: @JLTipper

Nikita Gupta
Digital Strategy Consultant, Public Safety
Email: nikita.c.gupta@accenture.com
LinkedIn: https://www.linkedin.com/in/nikita-gupta-1b2aa370
REFERENCES

1. Accenture 2018 Citizen Survey research wave 1 – conducted across Australia, France, Germany, Singapore, UK and USA
3. Accenture 2018 Citizen Survey research wave 1
9. Accenture 2018 Citizen Survey research wave 1
10. Accenture 2018 Citizen Survey research wave 1
11. Accenture 2018 Citizen Survey research wave 1
12. Accenture 2018 Citizen Survey research wave 1

ABOUT Accenture

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions – underpinned by the world’s largest delivery network – Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With approximately 442,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.

DISCLAIMER

This document is intended for general informational purposes only and does not take into account the reader’s specific circumstances, and may not reflect the most current developments. Accenture disclaims, to the fullest extent permitted by applicable law, any and all liability for the accuracy and completeness of the information in this document and for any acts or omissions made based on such information. Accenture does not provide legal, regulatory, audit, or tax advice. Readers are responsible for obtaining such advice from their own legal counsel or other licensed professionals.

Copyright © 2018 Accenture
All rights reserved.
Accenture, its logo, and High Performance Delivered are trademarks of Accenture.