

INTELLIGENT ENTERPRISE UNLEASHED

**A public safety perspective
on the Accenture Technology
Vision 2018.**

Accenture Technology Vision Executive Summary

PUBLIC SAFETY

Technology is now firmly embedded throughout our everyday activities, but its reach is larger than that:

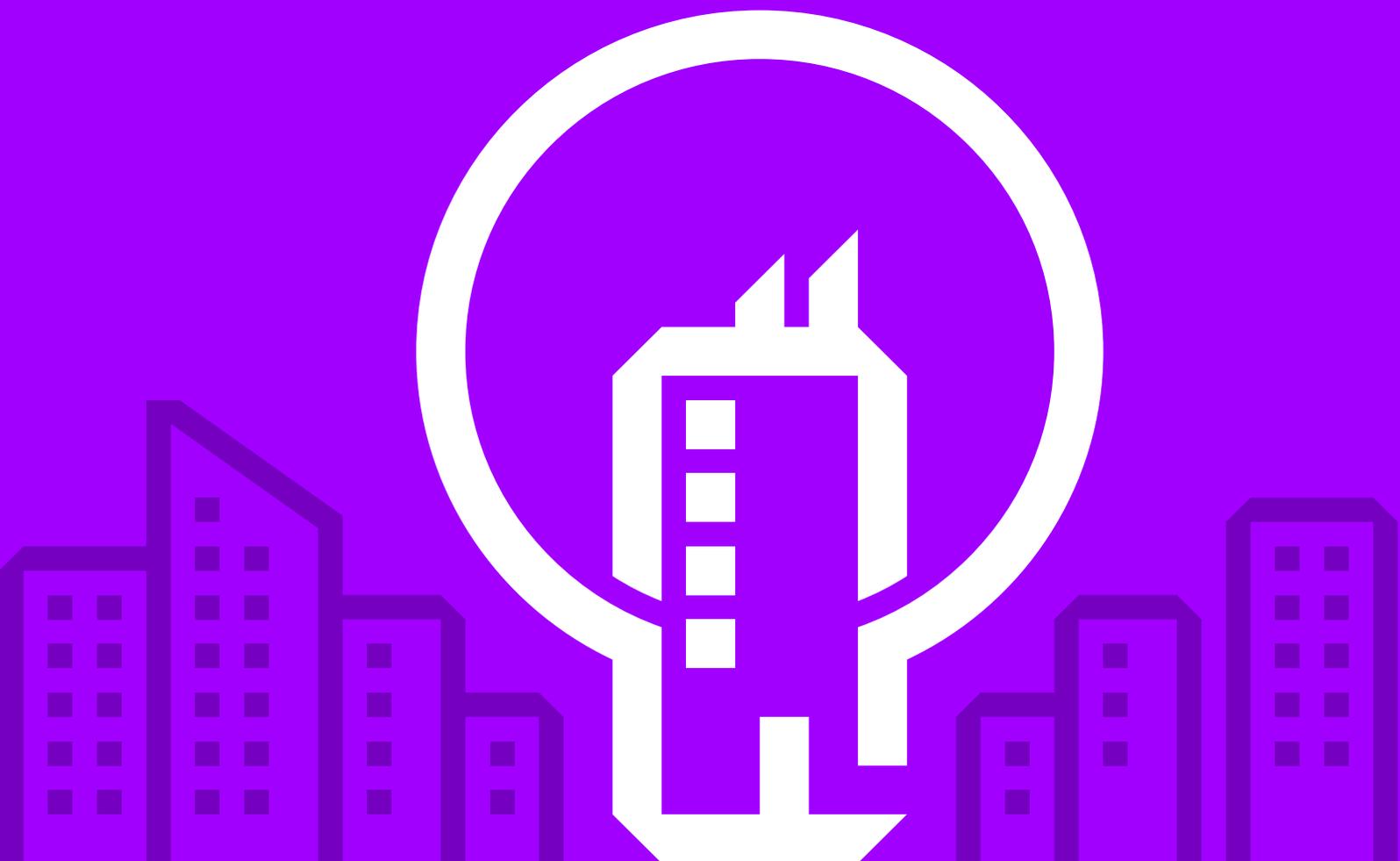
Organizations are using their products and services to reshape, reimagine, and transform how our society works, communicates, and governs. According to the global Accenture Technology Vision 2018 Survey, 82 percent of public service executives surveyed agree that through technology, organizations are weaving themselves seamlessly into the fabric of how people live today.

For public safety organizations, this weaving and blurring of distinctions is not only between people and technology, but also between citizens and public safety agencies, and how they can interact and collaborate in new ways. Sir Robert Peel, in creating the London Metropolitan Police Service, declared that “the police are the public and the public are the police”¹. That assertion takes on another dimension with the availability of digital technologies to enable citizens and public safety organizations to interlink and interact in completely new ways, sharing information and intelligence in a fast-evolving new virtual space.

As we move into a world driven by data, machines will take more decisions than ever.

In addition, public safety agencies also have to contend with another form of blurring: between the physical and the virtual or digital worlds. There are few crimes today, that do not have at least some digital component; for example with online threats from radicalization, the proliferation of indecent images and the use of social media for coercion and organization of disorder. That's changing the way that the police need to prevent, detect and solve criminal activity. And the increasing use of digital technologies is also changing the working practices of officers' and staff day-to-day activities, enhancing their situational awareness 'on the beat', aiding real-time decision making, while also increasing the accountability and transparency of their actions.

Finally, the development and deployment of artificial intelligence (AI) will increasingly blur the lines between human and machine driven decision-making and responses. As we move into a world driven by data, machines will take more decisions than ever. Making sure they make the 'right' decisions and operate according to the expected standards of police behavior will be critically important in maintaining the trust and confidence of the public.



2018 Technology Vision

INTELLIGENT ENTERPRISE UNLEASHED

This year's Accenture Technology Vision highlights five emerging trends shaping the way technology is increasing organizations' impact across society.

Within each trend, you will see how expectations are growing, as citizens, customers, employees, business partners, governments, and more, seek formalized partnerships with the organizations that serve them.



Trend 1
CITIZEN AI
**Raising AI to Benefit
Business and Society**

As artificial intelligence grows in its capabilities—and its impact on people’s lives—organizations must move to “raise” their AIs to act as responsible, productive members of society.



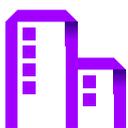
Trend 2
**EXTENDED
REALITY**
The End of Distance

Virtual and augmented reality technologies are removing the distance to people, information, and experiences, transforming the ways people live and work.



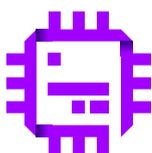
Trend 3
**DATA
VERACITY**
The Importance of Trust

By transforming themselves to run on data, organizations have created a new kind of vulnerability: inaccurate, manipulated, and biased data that leads to corrupted business insights, and skewed decisions with a major impact on society.



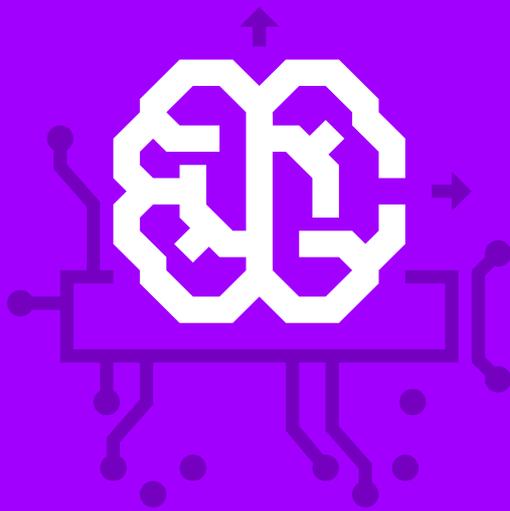
Trend 4
**FRICTIONLESS
PUBLIC SAFETY**
Built to Partner at Scale

Organizations depend on technology-based partnerships for growth, but their own legacy systems aren’t designed to support partnerships at scale. To fully power the connected enterprise, organizations must first re-architect themselves.



Trend 5
**INTERNET
OF THINKING**
**Creating Intelligent
Distributed Systems**

Organizations are making big bets on intelligent environments via robotics, AI and immersive experiences. But to bring these intelligent environments to life, they must extend their infrastructures into the dynamic, real-world environments they want to reach.



Trend 1

CITIZEN AI

Raising AI to Benefit Business and Society

For public safety organizations, deploying AI is no longer just about training it to perform a given task. Similar to the way parents raise their children, it's about "raising" AI to act responsibly.

Many organizations still treat AI as a software program—a tool to be used. No one would expect a tool to “act” responsibly, explain its decisions, or work well with others. But with AI systems making decisions that affect the public they serve and with heightened expectations of accountability and transparency, public safety organizations must teach AI to do these things, and more.

By recognizing the impact AI now has in society, that it must become a critical tool in preventing and detecting crime, and raising it accordingly, public safety organizations can create a collaborative and powerful new member of the workforce. However, collaboration will be most successful if agencies ensure there are ways of understanding an AI system’s outputs, whether by citizens and employees, or other artificially intelligent systems. AI can’t be regarded as a “black box” exempt from the need for transparency.

AI has come of age for public safety organizations. It is a tool that they must increasingly embrace. Faced with an explosion of data of many different types and from many different sources, agencies will be overwhelmed without the ability of AI to ‘see the unseeable’ in terms of being able to capture, identify and drive insight from patterns or events that humans will almost certainly miss.

For example, Accenture has developed an AI engine that is able to identify the likelihood of someone in a chatroom engaging in predatory behavior. Using machine vision, we have also trained AI to understand video images and detect likely criminal behavior. This was initially used to spot incidents of illegal waste disposal – ‘fly-tipping’ – but is now being evolved to detect other types of criminality for example to tackle the challenge of robberies from mopeds or motorbikes. By analyzing a number of different factors, from the lack of a license plate on the

vehicle to the number of passengers, the AI is able to, in real time alert police officers to suspicious activity. As AI technology continues to advance and as the use of “AI Platforms” develop, the combinatorial power of different types of AI engines – bringing together the power of functionality such as facial recognition, object detection, translation, geolocation, semantics, and more – creates the possibility of achieving insights that are beyond human capabilities.

However, being able to prevent and detect possible criminal activity in new ways must not override or transgress the rules that govern all public safety operations. That’s why ‘raising’ and educating AI to be responsible is fundamental to its successful use. Making sure that AI is explainable is therefore key. Having the right governance and accountability in place is therefore only going to be more and more important to ensure trust and confidence in AI.

Public safety organizations and their partners will need quality data to train AI how to do its job and in doing so will create the accurate and capable AI systems. However, data scientists must take care when selecting taxonomies and training data—it’s not just about scale, but about actively minimizing bias in the data and AI itself. It is also important that the use of AI is monitored on an ongoing basis to understand and detect any such bias so appropriate action can be taken.

As AI becomes more firmly and widely integrated into society, it will have an increasingly powerful influence and impact, indeed it will also create new threats and vulnerabilities. Public safety agencies must be willing to embrace AI and confidently consider its potential to help achieve their mission. But as they move forward, it’s essential that they actively “raise” their AI to ensure appropriate support and secure the success of this new approach.



Trend 2

EXTENDED REALITY

The End of Distance

Virtual reality (VR) and augmented reality (AR) deliver immersive experiences that extend reality. Extended reality (XR) is the first technology to let people experience omni-present abilities, relocating them in both time and place—bringing about the end of distance.

Results from our Tech Vision 2018 survey show 66 percent of public service executives say that it's important or very important for their organizations to pioneer the use of extended reality solutions.

The fundamental changes to organizations and society are clear: the importance of place is disappearing. Extended reality is removing the hurdle of distance, increasing access to people, information, and experiences.

Consider XR-based training: organizations can bring trainers "on-site" from anywhere, or have students virtually "travel" to an instructor; training scenarios can be set up anywhere, then run, re-run, and adjusted to give a first-hand experience of different situations. This eliminates the distance not just between student and instructor, but also concept and practice. In the public safety arena, the ability to use virtual reality to train police officers in a wide variety of highly realistic scenarios is creating new possibilities. Not only can it be used to recreate a variety of potential training scenarios, but VR can also be deployed to show and explore what a real environment will be like before officers engage. For example, officers could carry out detailed virtual reconnaissance of a hostage location before entering the premises.

What's more, VR creates the possibility of helping officers to understand how to handle complex or sensitive situations. For example, a UK force² has already used a virtual "cave" to train officers for real life domestic violence cases. And it's not just police officers who can learn from the heightened realism that VR enables. We're also seeing pilots in the courtroom that use the technology to give jurors an immersive experience of a crime-scene, enabling them to inhabit the same environment in which an alleged incident took place.

Extended reality also means being able to share a common information environment, regardless of where an individual happens to be. Headsets can display the same

information across many different users, with technology like Microsoft HoloLens creating 3-D mixed reality experiences that blend the physical and the digital. When combined with AI these can also project information and insight to officers. In Zhengzhou province, East Central China this technology is being used by rail police to provide facial recognition and help with crowd management³. While still experimental, the potential for technologies like these are to create a new layer of information for operational resources, enhancing their ability to understand and respond to their environment.

Extended reality is also closing the distance to new insights. Emerging XR tools express data in 3D environments, closer to the way humans actually see and imagine scenarios. This clears the way for new types of visualizations—and new discoveries. Extended reality is changing the viewer's relationship to information: how people parse, communicate, and extract value from data.

Today, extended reality is still evolving, and challenges around processing lag and content creation remain barriers to its full maturity. But thanks to its transformative potential, 66 percent of public service executives agree that it is important or very important for their organizations to be a pioneer in XR solutions.

Making well-planned forays into immersive experiences now will help build the capabilities needed to transform tomorrow. Extended reality is pushing companies to create new solutions that bypass many of the distance-based challenges they face today—a clear advantage for leading organizations that embrace such solutions. As XR becomes pervasive, immersive experiences will eliminate the most important distance of all: the distance between where public safety organizations are today and where they want to be in the future.



Trend 3

DATA VERACITY

The Importance of Trust

While all organizations are more data-driven than ever, inaccurate and manipulated information create a new vulnerability which threatens to compromise the insights that they rely on to plan and operate.

The potentially grave harm from bad data both creates a risk for public safety organizations themselves, but also a new threat which they will need to be able to prevent and detect. According to our survey, 78 percent of public service executives agree that organizations are basing their most critical systems and strategies on data, yet many have not invested in the capabilities to verify the truth within it.

Organizations can address this vulnerability by building confidence in three key data-focused tenets: provenance, or verifying the history of data from its origin throughout its life cycle; context, or considering the circumstances around its use; and integrity, or securing and maintaining data. For instance, many researchers have pointed out the risk of Cognitive Bias in Big Data ⁴. One example is the so-called “recency bias” whereby users can succumb to the effects of their own “availability heuristics” and consequently weigh recent event data more strongly than historic data, resulting in a potentially misleading perspective of future trends.

Overcoming challenges like these necessitates ramping up existing efforts: embedding and enforcing data integrity and security throughout the organization, while adapting existing investments in cybersecurity and data science to address data veracity issues.

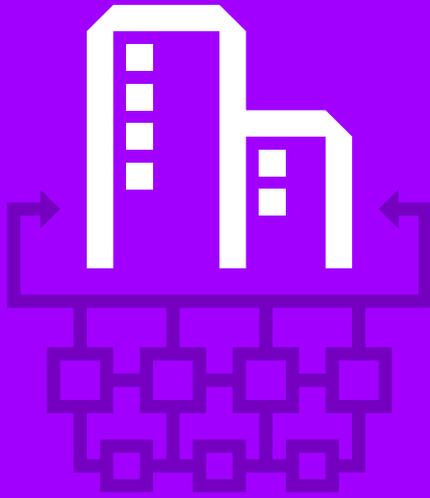
In much the same way that criminal targets’ “patterns of life” are observed for anomalies and out of character actions, “patterns of data” will need to be similarly scrutinized. Police forces have had intelligence units for many decades. That same approach

will have to be applied to becoming data intelligence units. To achieve the best results, those intelligence units will need to combine smart technologies and human insight. That’s what, for example, MIT has developed with its cutting-edge anomaly detection system AI2 ⁵. This identifies abnormal patterns of behavior, then categorizes them based on experience provided by human experts. AI2 detects 85 percent of cyber-attacks, and presents the most pressing incidents to experts for review. It’s easy to see how a similar system and role could operate in the public safety context.

Equally important is the ability to verify data for evidentiary purposes. This is where technologies like blockchain come into play. The ability to track and verify digital evidence—from video to emails and computer files—across the criminal justice lifecycle is essential to ensure the continuity of evidence. To address it, Accenture is creating a proof of concept that uses blockchain to ensure that digital evidence is secured and a verifiable and trusted body of evidence is maintained.

At a fundamental level, data is the lifeblood of all the cutting-edge technology trends outlined in the Technology Vision. It drives everything. From AI to extended reality, without high quality, verified data these technologies will never achieve their potential. Therefore the security of this data to maintain its quality and integrity is critical.

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Trend 4

FRICTIONLESS PUBLIC SAFETY

Built to Partner at Scale

Solving complex public safety issues is far from just a matter for the police or criminal justice system alone. Partnerships across different public service agencies—health, social services, education and so on—are essential.

Indeed, the Public Safety Ecosystem is and must continue to both grow and diversify to include a range of new partners from all sectors with skill, assets and capabilities which help combat evolving threats. Yet trust between these agencies and partners can be limited; and that inhibits the willingness to share information.

Take, for example, a family moving to a new location. They may need to register their information with many different services – from local government to schools, and health providers to the emergency services. Despite providing that information to multiple agencies, who has the latest copy of that data and who would a family contact if they ever needed to update it is unclear. Frictionless services are the way to bring all these public partnerships together to provide the best possible service to the citizen.

That's what The Republic of Estonia⁶ is moving towards with its blockchain-based smart contract system that operates like an ecosystem of partners. All public data, from medical records to residency information, is exclusively stored and maintained by local offices that create it, rather than in a centralized database. When completing a task requires cross-departmental information, whether creating a birth certificate or filing a police report, government employees use "X-Road," the country's smart contract system. X-Road automatically authenticates the requestor's identity, verifies their need to access the information, and regulates the time and ways in which the requestor can use the information. The framework enables fast, secure data-sharing between government agencies, while giving citizens insights into who is accessing what data and maintaining security.

Using trusted technology - such as blockchain and smart contracts - to share information securely between these agencies can expand partner networks into ecosystems that grow the range of insights that public safety organizations could draw on to prevent crime.

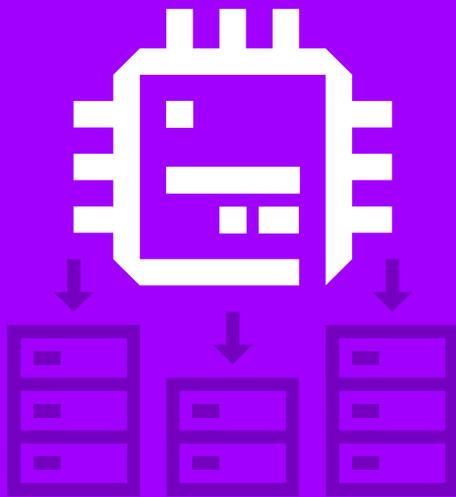
But legacy systems weren't built to support this kind of expansion, and soon, outdated systems will be major hindrances to growth.

To build a strong foundation for technology-based partnerships, agencies must consider adopting microservices architectures and using blockchain and smart contracts. Those that invest in these changes today will redefine how they exchange and collaborate in the future. But rather than using these approaches to create new products and services (as in the commercial sector) the potential for public safety is not only to connect with other forces and agencies more effectively, but to connect in new ways with citizens and develop new intelligence capabilities.

To spur a new wave of technology-based partnerships, organizations must start inside their own walls. Microservices is not a single piece of technology, but rather an approach to architecture. It delivers internal benefits like application scalability and reliability, but it is also vital for building technology partnerships – both with other agencies and the wider public.

If microservices is the key to scaling and integrating partnerships, blockchain will be critical to managing and operating them. For example blockchain has the capability to enable police, education, health and local authority partners to confidently and securely share their data to help proactively protect the vulnerable and to help ensure they have a joined up and co-ordinated cross-agency intervention approach. Public safety organizations will be challenged to maintain a higher volume of partnerships than ever before, and even rapidly pivot between partners, without sacrificing the integrity or security of their services. Blockchain will address this complexity by acting as a surrogate for trusted relationships.

While many blockchain initiatives are still in their early stages, 51 percent of public service organizations responding to our survey say that blockchain and smart contracts will be critical or very critical to their organization over the next three years.



Trend 5

INTERNET OF THINKING

Creating Intelligent Distributed Systems

Robotics, immersive reality, artificial intelligence and connected devices are bringing a new level of technological sophistication to the physical world. Cities and homes are getting smarter.

The volume of data flowing from people and devices, vehicles and sensors is rapidly growing. Public safety agencies need to understand how to manage and use that wealth of data, which presents both a new risk and vulnerability that needs to be managed and also a new opportunity to gain greater insight (often in real time). But the key challenge remains making it actionable for those in the field.

The demand for immediate response times in physical-world applications defies traditional approaches to sharing information and data. Current predictions suggest that by 2020, smart sensors and other Internet of Things devices will generate at least 507.5 zettabytes of data. Trying to do all of the computational heavy lifting offsite ultimately will become a limiting factor. The resulting need for real-time systems puts hardware in focus: special-purpose and customizable hardware is making devices at the edge of networks more powerful and energy efficient than ever before.

Across industries, the next generation of intelligent solutions are moving into physical environments, and key strategies ride on pushing intelligence into the physical world. For example, some bars in Amsterdam

are equipped with sensors on beer taps that indicate how much beer is being served. This enables the police to see when consumption is significantly above average and prepare for the potential consequences. Similarly, the city of Amsterdam has installed sensors in the sewers that can detect the amount of drugs. This enables a more proactive approach to reducing public harm. This type of insight will increase as different types of sensors develop and their proliferation increases, public safety agencies will need to think creatively about how they are best used to protect the public.

To drive AI, robotics, and other revolutionary technologies to their full potential, organizations must make a significant effort across key areas of business processes and strategy, from service design, to infrastructure transformation, to hardware considerations. The well-earned result will be truly intelligent environments that create new possibilities for increasingly preventative public safety approaches and models.

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Five trends, one goal

INTELLIGENT PUBLIC SAFETY ORGANIZATIONS

The technology advances outlined in this year's Accenture Technology Vision all point to a future for public safety that is more collaborative, connected and intelligent than ever.

New forms of data – and the AI to make sense of them – are empowering public safety agencies to sense, predict and act more decisively. The distinctions between the physical and digital world will continue to blur. Positive and productive interaction between public safety organizations and the citizens and communities they serve will be further enriched by digital technologies that enable greater sharing and use of intelligence. Above all, it's the ability of technology to empower people to do more that will shape the future of public safety and secure the mission outcomes from which everyone will benefit. It remains critical, however, that trust and legitimacy remain primary considerations among the many possibilities that will be created for public safety organizations as this technology revolution continues.





**Accenture Technology Vision
all point to a future for public
safety that is more collaborative,
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