

Assistive AI:

Delivering real-time insights for
next-level awareness

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Chapter 1

Identifying blind spots

Connections are important. Not only do they provide a critical emotional link between people, but they also bridge gaps in technology and infrastructure.

In the world of public safety, making a connection is vital to safety, efficiency, and overall success. When connections are missed within disparate data, it creates operational blind spots across live and historic events. This puts the well-being of the public – and the reputation of the public safety organization – at risk.

Blind spots emerge from different levels of an organization. For example, dispatchers don't work 24 hours a day, nor are they privy to the details of every call received by emergency communications centers.

Consider how operational blind spots can precede a complex emergency:



Tuesday, 8:45 a.m. A man calls an emergency telephone number to report his white van was stolen.

Tuesday, 6:10 p.m. A caller reports a white van driving erratically down a busy street.

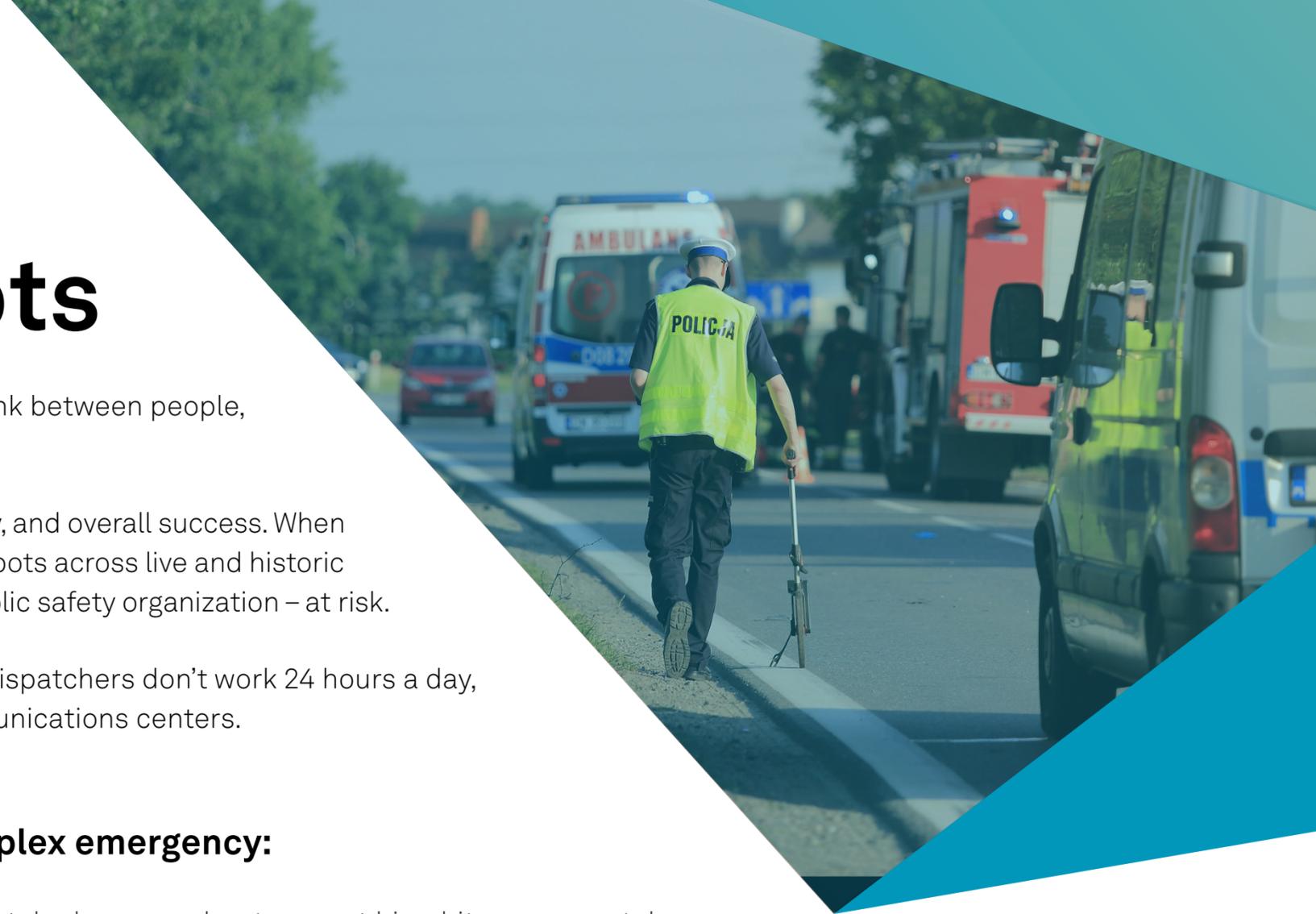
Wednesday, 7:25 a.m. A witness calls to report a violent robbery and kidnapping attempt. A white van is seen leaving the scene.

Wednesday, 8:05 a.m. A white van crashes into a pedestrian walkway, injuring dozens of people.

The scenario is fictional, but not out of the ordinary in today's world. The smartest and safest cities have contingency plans for natural disasters, but man-made incidents are unpredictable and can escalate rapidly.

Threats are growing, and so are their impacts. Even worse, when major incidents do occur, comms centers are inundated with a sea of information that dispatchers must sift through to find relevant details to inform their response.

The best chance public safety agencies have to make connections and fill operational blind spots is to uncover relevant insights sooner.



Chapter 2

Seeing the unseen

One of the primary goals of a public safety agency is to provide emergency services to citizens in a fast, efficient manner. To that end, comms center personnel must make split-second decisions as events unfold in real time.

Getting it right 100% of the time involves more than diligence and awareness on their part; it requires recognizing critical connections. That means detecting patterns, similarities, and correlations between calls, which can often precede everything from low-level crimes to large, rapid on-set events.

Most legacy computer-aided dispatch (CAD) systems don't have the ability to recognize potential "red flags" within the data pouring into the center. Organizations also face frequent staffing issues, resulting in overworked personnel.

Whether because of schedules or the number of calls handled, the dispatcher who answers the first white van call at 8:45 a.m. on Tuesday is unlikely to be the same person who takes the call at 6:10 p.m. Contextual searches of CAD data can help bridge such gaps in personal knowledge, but they are simple, and don't always produce results. These gaps, which create blind spots, make public safety organizations vulnerable.

The introduction of **artificial intelligence (AI)** and machine learning (ML) within the public safety market provides organizations with the assistive insights they desperately need. These next-generation technologies enable organizations to see the unseen.



If we do it right, we might be able to evolve a form of work that taps into our uniquely human capabilities and restores our humanity. The ultimate paradox is that this technology may become a powerful catalyst that we need to reclaim our humanity.

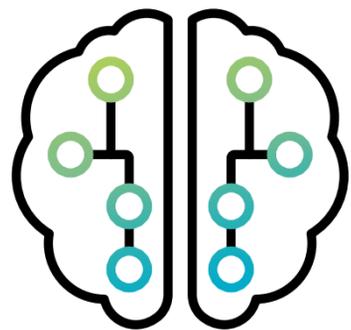
John Hagel, management consultant & author

Chapter 3

AI within our world

To fully understand how AI can help public safety agencies, it's important to understand AI is already pervasive. From GPS devices and ride-share services to responsive home speakers, AI is all around us.

While the base concepts of AI date back to the early 20th century, the technology has become considerably more advanced over the last 25 years.



Today, AI is prevalent in the way we communicate, work, live, and travel:

- **Smart assistants:** Voice-activated devices in our homes, pockets, and purses comply with voice commands
- **Predictive searching:** Powerful search engines help users narrow down search terms after typing just a few letters
- **Preferences:** Apps, using a device microphone, can tell users the name of a song playing at a restaurant and recommend similar offerings
- **Assistive chat / email:** Programs predict users' word choices when sending a text or email
- **On the road:** Modern vehicles have safety features like lane departure warnings, backup sensors, and self-parking
- **In the home:** Smartphone apps control a home's temperature, adjust the lighting, see who rang the doorbell, lock the doors, and audit the contents of the refrigerator

Considering AI's vast capabilities, its growing usage within a public safety organization seems like a natural fit:

- **Comms centers:** Chat applications create new channels between the public and comms centers
- **Health applications:** Voice analysis helps determine the nature of a caller's medical emergency
- **Crash detection:** Vehicles call 9-1-1 / 112 when a collision occurs, while an on-board GPS system helps responders locate the vehicle
- **Rapid response:** Gunshot detection systems send coordinates to comms centers so officers can be quickly dispatched to the location
- **Investigations:** Criminal case resolution through matching DNA or genetic evidence
- **Firefighter safety:** Biometric devices monitor stress and heat levels to protect firefighters from heat exhaustion and/or physical injury
- **Weather impacts:** Alerts help responders and the public prepare for adverse weather events and provide real-time information (e.g., flooding, wind gusts, ice) that could impact operations

In all of these examples, there is a necessary component – human interaction. Whether it's everyday life or public safety, AI shapes decisions autonomously, but it doesn't always make decisions independently. In the emergency call center, human interaction will always guide and determine the outcome of a call, from a seemingly minor incident to a large, rapid-onset emergency.



A **market survey**¹ of public safety professionals found 81% of respondents said AI is somewhat, very, or extremely important to their organizations. A recent **IDC report**² described AI as “inescapable,” and predicted 90% of new enterprise apps would leverage AI by 2025.

¹ “Technology & its use in public safety organizations,” Hexagon, September 2020

² “IDC: Top 10 worldwide IT predictions for 2020, Oct. 29, 2019

Chapter 4

Assisting employees under pressure

Not all public safety agencies are embracing AI, but that's changing. The reason why more commercial organizations are adopting AI is truly threefold. Technology improvements result in greater operational efficiency, lower costs over time, and enhanced performance. Where AI is also having a significant public safety impact, however, is at the human level.

When complex emergencies occur, dispatchers are placed under tremendous strain. Not only do they have to parse through a deluge of incoming data, but they must also gather pertinent information for internal and external decision-makers.

Prolonged stress can be damaging to all levels of an organization. Call-takers and dispatchers inundated with dire information from frantic callers face an increased risk for post-traumatic stress disorder (PTSD). The risk is even greater when they don't have real-time insight into what's happening in the field or know the outcome of a situation.

Other personnel, including PSAP managers and data analysts, also face stress, but for different reasons. An overworked PSAP means higher turnover and health problems among staff, forcing managers into a situation in which an experienced call-taker with a substantial knowledge base is replaced by a new, inexperienced hire.

For intel and tactical personnel, stress occurs because there's often a lag between logging events and analysis. The manual monitoring of alarms, video, and common operating pictures puts them at greater risk of overlooking a relevant link.



Artificial intelligence and machine learning, as a dominant discipline within AI, is an amazing tool. In and of itself, it's not good or bad. It's not a magic solution. It isn't the core of the problems in the world."

Vivienne Ming, executive chair & co-founder, Socos Labs



Chapter 5

Assistive AI for public safety

Some fear a world where AI is in complete control of our lives, but while some uses are truly autonomous, most AI applications purely assist humans. Public safety solutions that leverage assistive AI and ML don't make decisions, but instead provide timely, accurate insights to help users make informed decisions.

The debate over the merits, advantages, or uncertainties regarding AI in public safety isn't likely to fade. But it's important for organizations and the public to understand there are stark differences between predictive solutions that issue guidance based on dubious algorithms and assistive solutions that issue alerts based on useful context or a potential situation.

Consider the benefits:

- Dispatchers' stress is reduced when they can easily share or act quickly on relevant information as opposed to worrying about missing a critical connection.
- Comms center managers' stress is reduced when dispatchers make confident decisions.
- Tactical and intel personnel stress is reduced when they can assess verified links between events.



Some people call this artificial intelligence, but the reality is this technology will enhance us. So instead of artificial intelligence, I think we'll augment our intelligence."

Ginni Rometty, executive chairman of IBM

Chapter 6

Making the connection

Public safety organizations with operational blind spots now have a first-to-market solution designed to scan a broader horizon, regardless of the agency, location, or event type. Developed with comms center personnel in mind, **HxGN OnCall® Dispatch | Smart Advisor** from Hexagon leverages AI and ML to notify users of trends, anomalies, and similarities within CAD events.

The key to Smart Advisor's success is autonomous agents continuously working in the background to mine current and recent event data in real time. When an agent's conditions are met, alerts are sent to the user, who can assess, act on, and share the information. The trainable agents can also be configured to users' specific operational needs and alerts refined to their personal preferences using thumbs up/down feedback buttons.



Nobody phrases it this way, but I think that artificial intelligence is almost a humanities discipline. It's really an attempt to understand human intelligence and human cognition.

Sebastian Thrun, German entrepreneur & computer scientist



The following example illustrates how Smart Advisor can identify a series of connected events and ultimately help resolve an incident:



The links between these incidents might not have been visible to the different personnel handling each call, but Smart Advisor connected the dots in real time utilizing advanced statistics, similarity, and fuzzy logic. The result is an additional layer of autonomous assessment more efficient, effective, and scalable than manual monitoring of video, alarms, and common operating pictures.

Delivering real-time insights

Around the globe, public safety agencies face similar challenges – larger service areas, shrinking budgets, overburdened personnel, and a growing number of threats. Loss of life and bodily injury aren't always necessary for a complex emergency to be deemed catastrophic. Man-made incidents that cripple a city's infrastructure (e.g., transportation, utility, and/or data systems) can be just as costly and damaging.

Operational blind spots often delay recognizing and responding to large, rapid-onset events. Impacts from smaller complex emergencies, such as the risk of avoidable harm, occur when repeat incidents aren't spotted. Failures in resolving linked events can also result in missed connections between reports.

By finding connections within data and issuing timely alerts, Smart Advisor enables personnel at all levels to make – and have confidence in – fact-based decisions. In other words, it does not automate decision-making; it equips decision-makers with crucial, real-time insights.

Fully integrated within the user interface of Hexagon's industry-leading CAD solution, **HxGN OnCall Dispatch**, Smart Advisor delivers relevant insights without disrupting workflows. It can also be tailored to the needs of the agency and each user.

[Explore HxGN OnCall Dispatch | Smart Advisor](#)

About Hexagon

Hexagon is a global leader in sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity and quality across industrial, manufacturing, infrastructure, safety and mobility applications. Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon's Safety & Infrastructure division provides software for smart and safe cities, improving the performance, efficiency and resilience of vital services.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 4.4bn USD. Learn more at hexagon.com and follow us @HexagonAB.

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