What will Control Rooms look like in the Near Future?

Nick Chorley – EMEA Lead for Public Safety

PSCE Conference, Brussels, 24th May 2018

PSCEurope
Public Safety Communication Europe

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A Common Operational Picture…. Crisis Management

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A Call for Service…

… Resource Allocation

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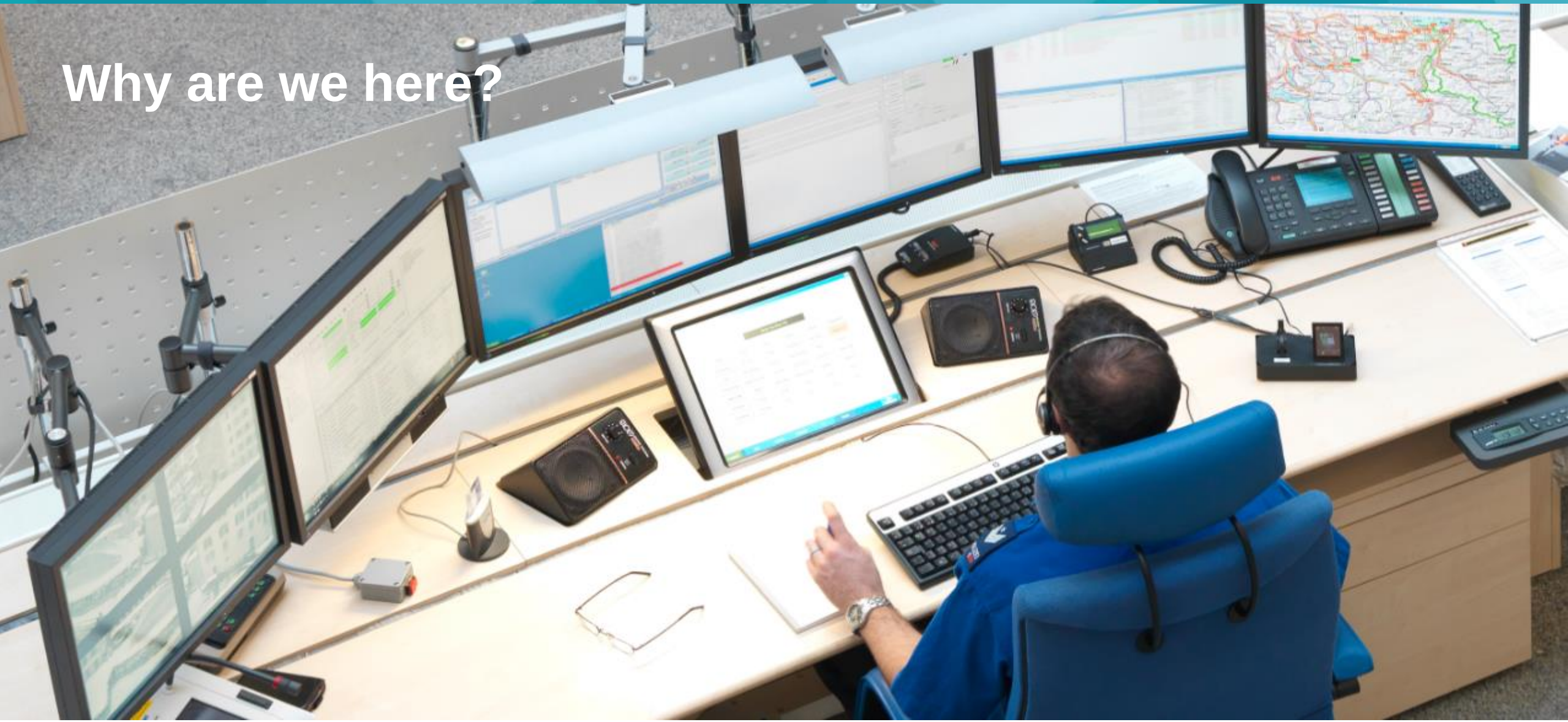
Why are we here?



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Agenda - Control Rooms in the Near Future

Why are we Here?

What's Changing and Why?

What does that mean for the people in the Control Room?

What does that mean for Control Room Systems and Suppliers?

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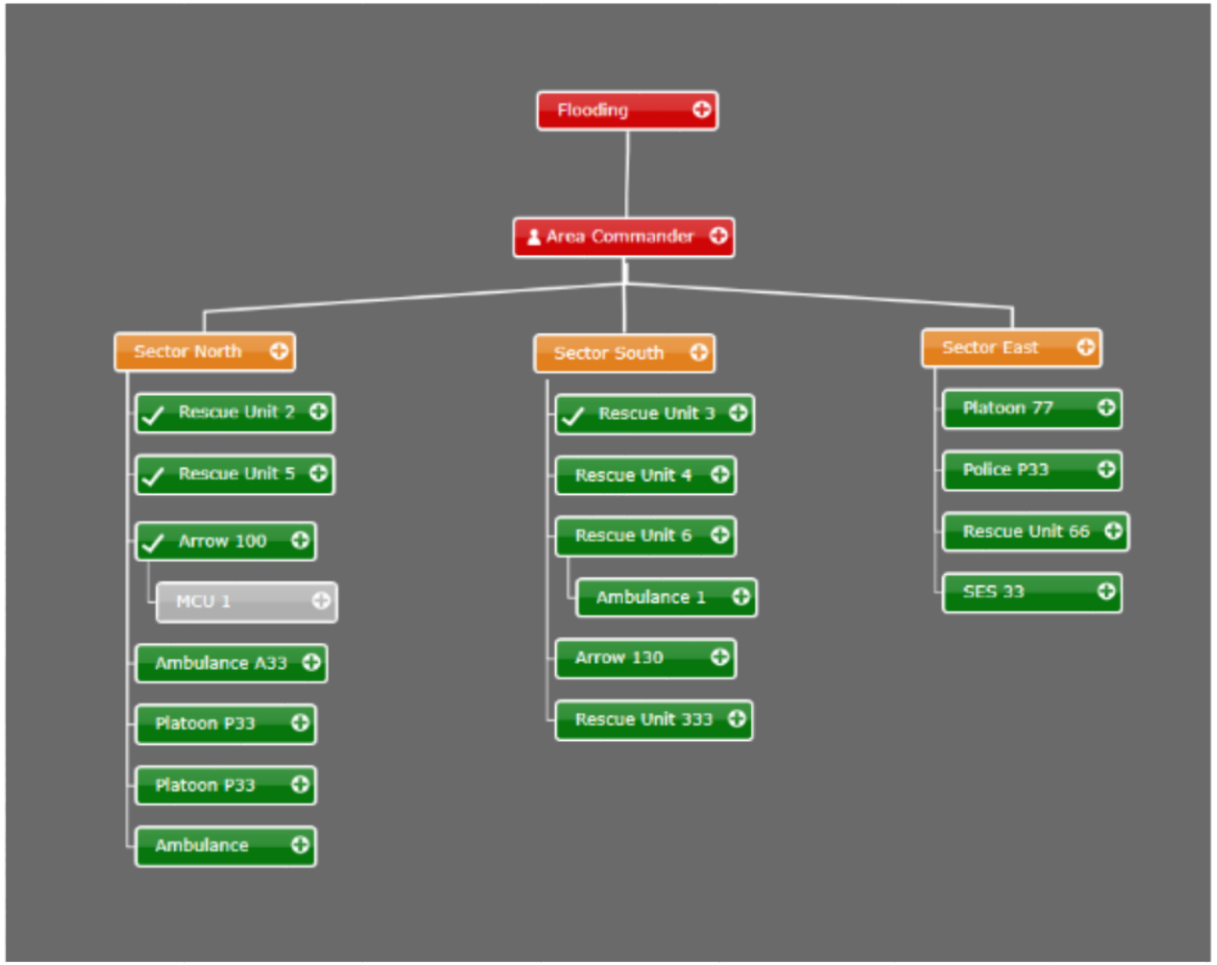
Respond to help...

Plan to prevent…



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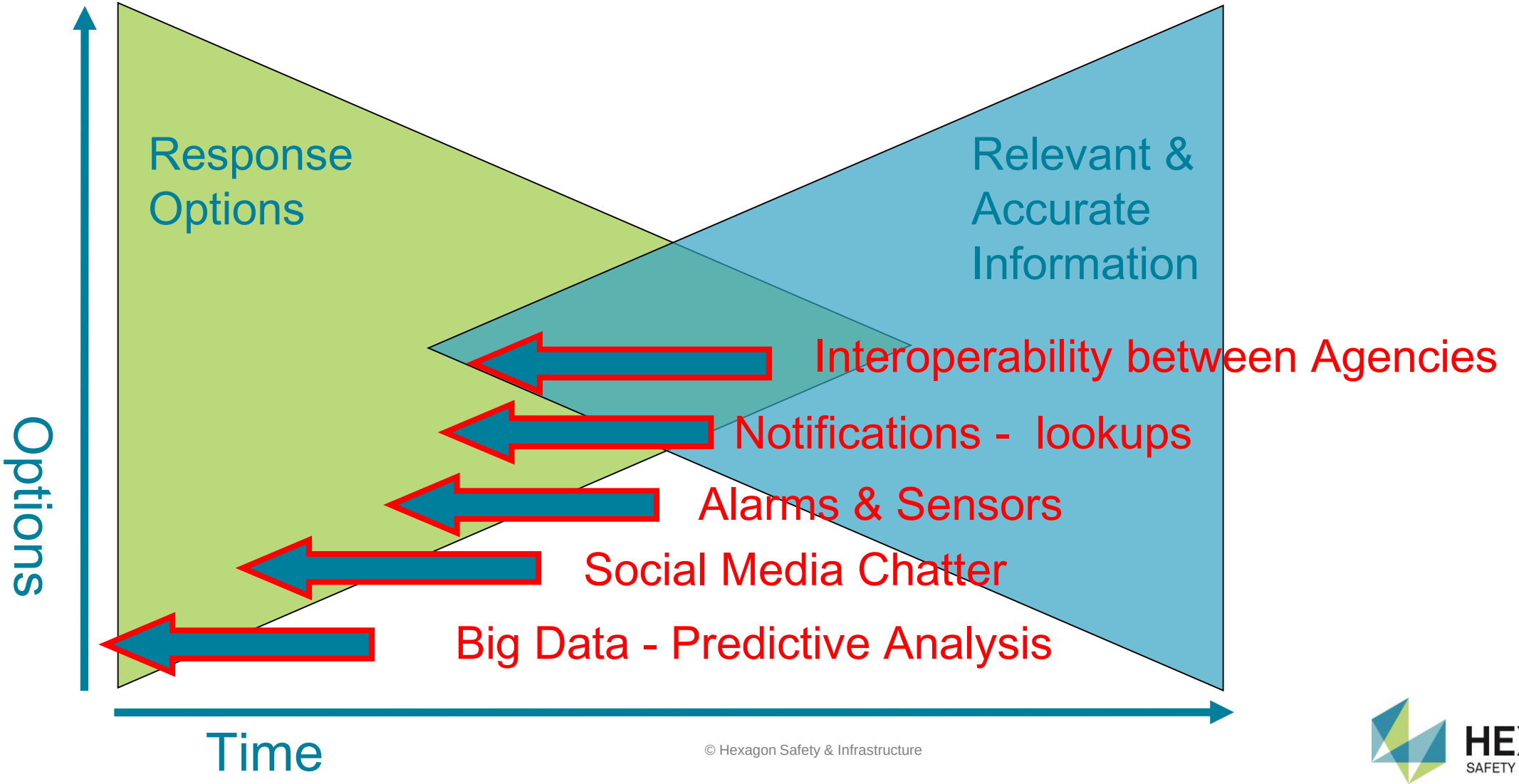
… it’s about presenting a Common Operational Picture

…so we can react as best we can, max'ing the Window of Decision



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Many Themes driving change

- Public expectation from Control Room services much higher than it was
  - Success of on-line telephone and digital commercial services
  - Sophistication of, and investment in, retail smartphones and apps at world scale (Billions)
  - “Doesn’t your system do that already?” – Consumer apps are often more sophisticated and current than what are often highly customised and niche agency systems
  - Demand for Multi – Channel access to services
  - Less capacity for failure at any level
- Public’s use of Social Media
- Technology in Data, Communications, Cloud, IoT, AI and Machine Learning, etc.
- Increasing demands for service whilst Austerity drives “Do more with Less”
- The focus on reducing ‘citizen burden’
- “Safe City” and “Smart City” initiatives

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We see different changes for different circumstances

Individual Calls for Service

Contact Centric Change Drivers

Demand Management

- Speak and Treat
- Defer and Schedule

Large Scale Events

Resource Centric Change Drivers

Resource Utilisation

- Mobility time efficiencies
- Resourcing Operations

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Demand Management

- Multi-Channel Contact
  - Solicited – Voice Call, Text, Post to monitored SM Account, Portal,
  - Un-solicited e.g. Social Media chatter and posts
- Commercial CRM style tools adopted
- Knowledge Bases to answer FAQs
- Scheduling non-urgent jobs to times more convenient with the public
- Outbound Call Handlers - Call Backs – is service still needed?

… Lots of Data… Lots of Patterns

Perfect for the application of Automation and Machine Learning

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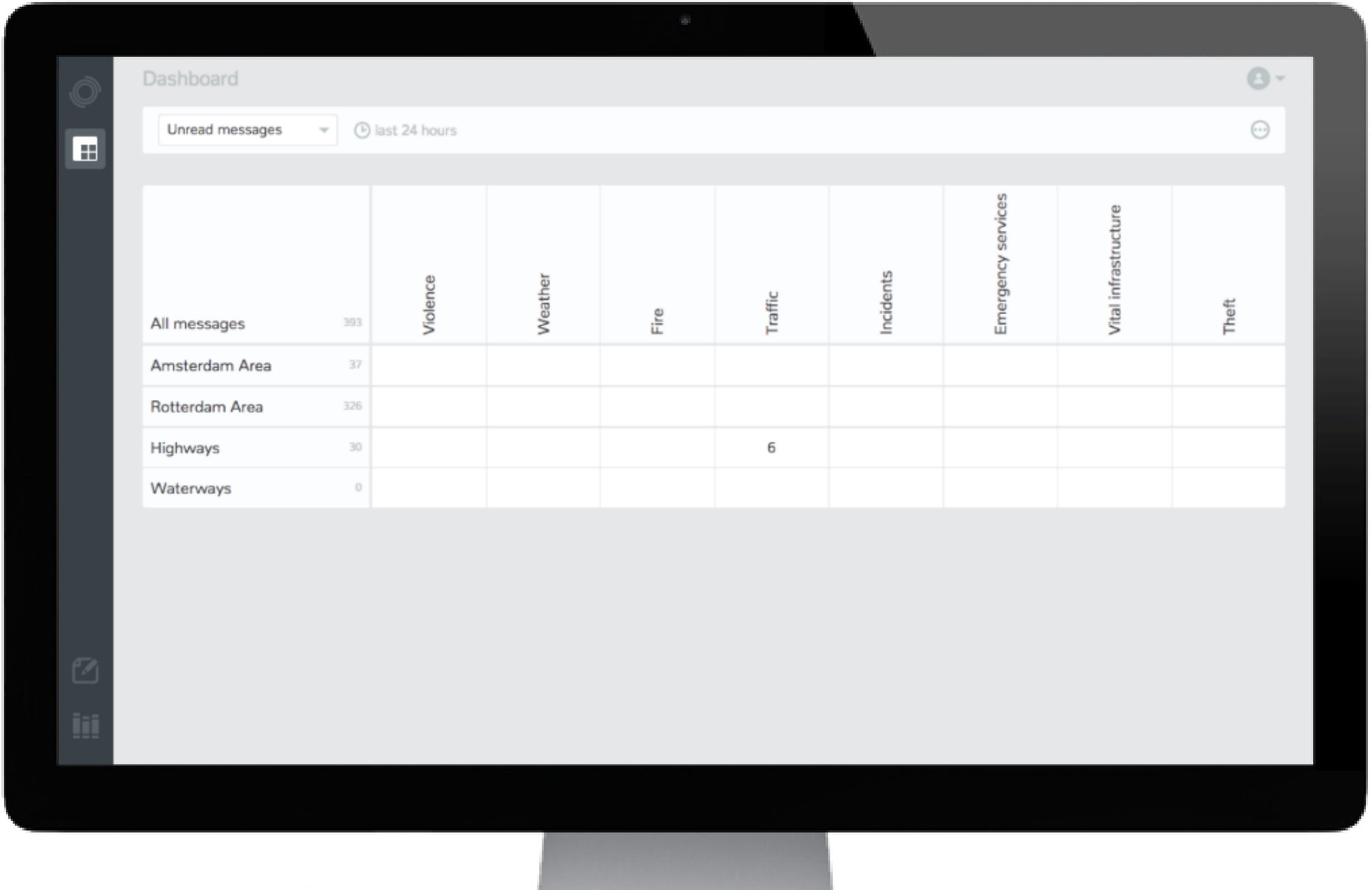
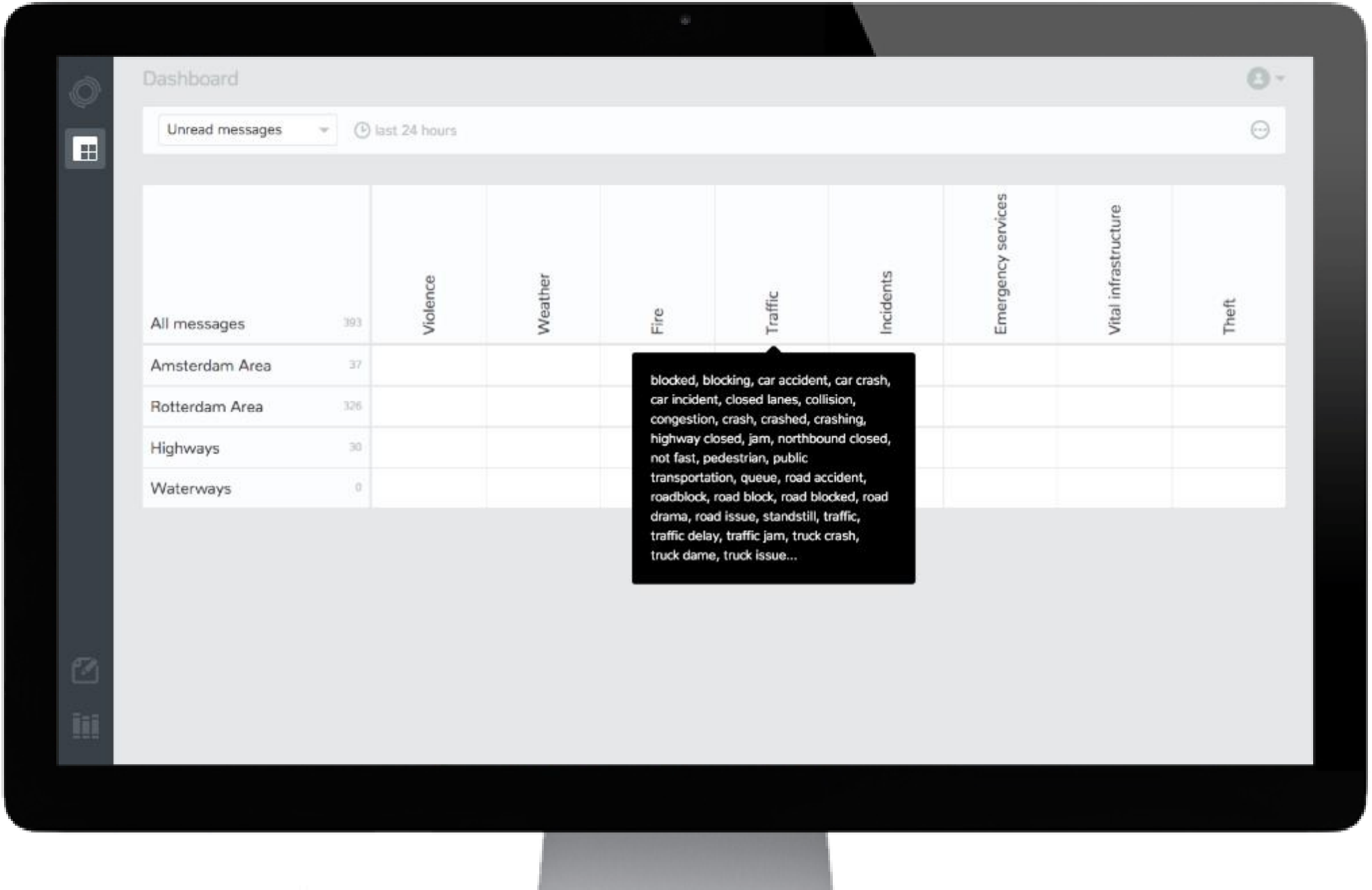
The Control Room will often be part of a Safe City Agenda

SAFE CITIES


SOCIAL MEDIA MONITORING
DESIGNED FOR THE PUBLIC SECTOR
Empower your daily operation with real-time insights from social media.
Detect events. Track incidents. Manage crises.
bsi.
ISO/IEC
27001
Information Security
Management


Dashboard
Unread messages
last 24 hours
All messages 393
Violence
Weather
Fire
Traffic
Incidents
Emergency services
Vital infrastructure
Theft
Amsterdam Area 37
Rotterdam Area 326
Highways 30
6
Waterways 0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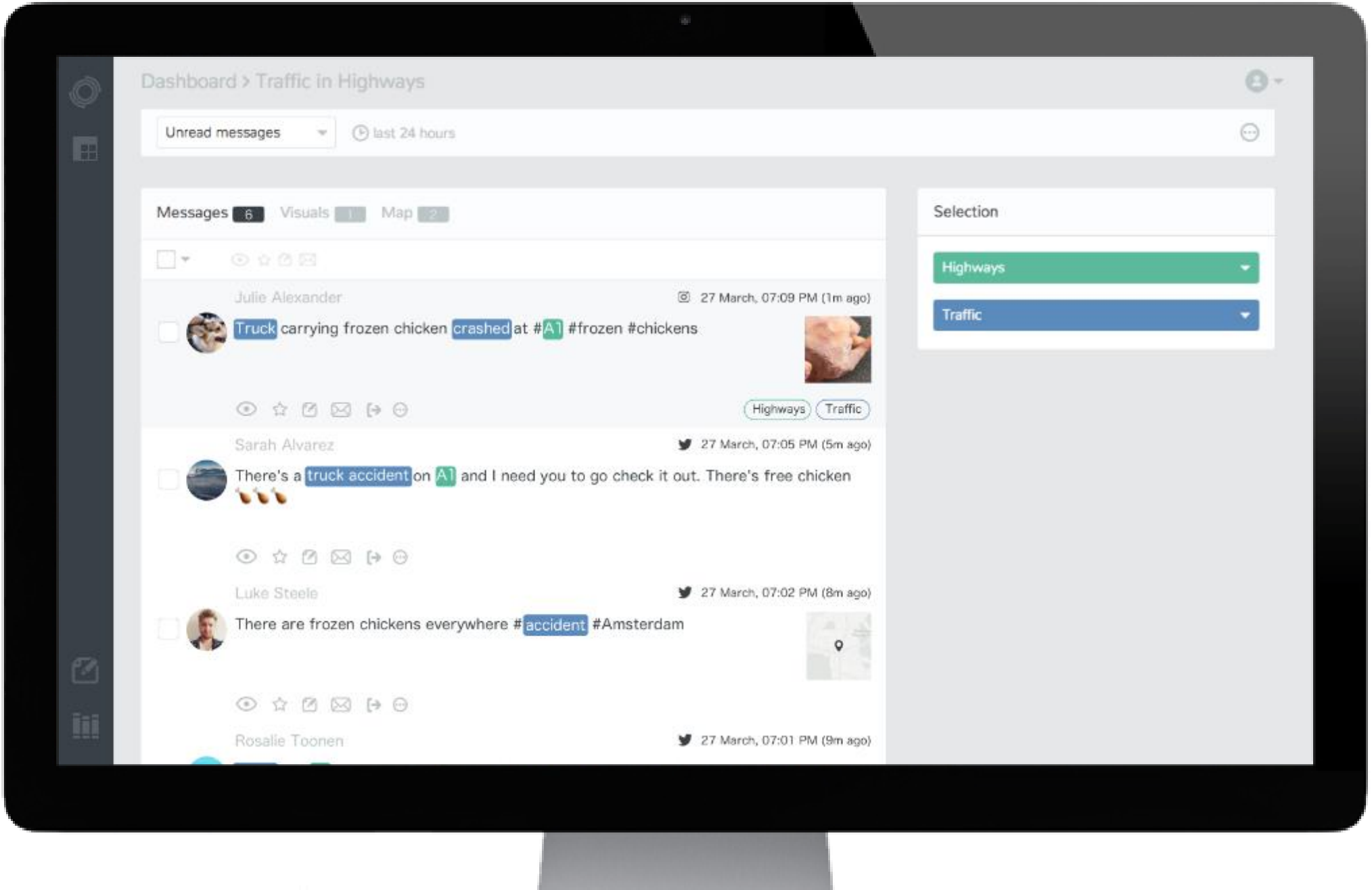
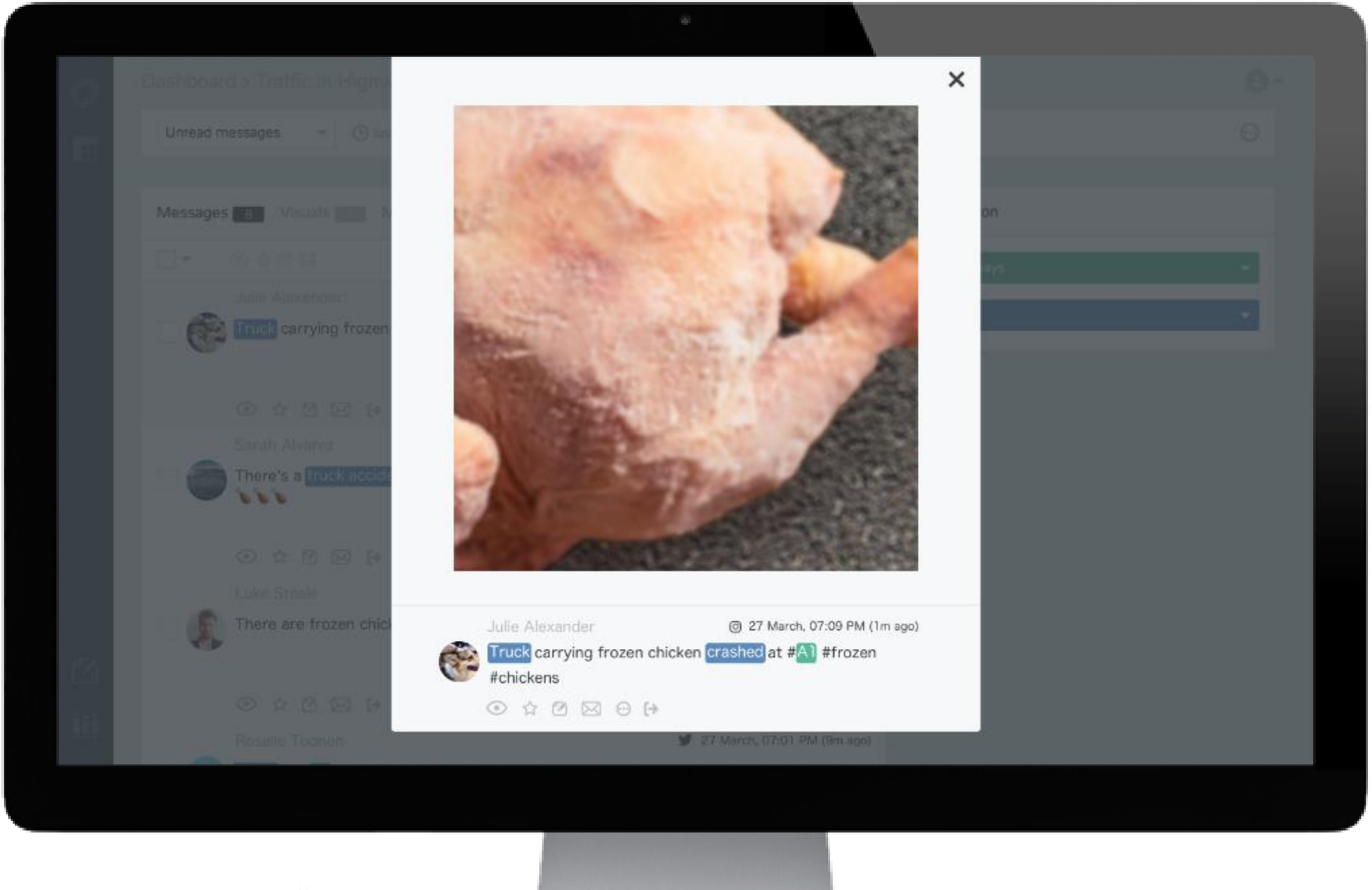
blocked, blocking, car accident, car crash, car incident, closed lanes, collision, congestion, crash, crashed, crashing, highway closed, jam, northbound closed, not fast, pedestrian, public transportation, queue, road accident, roadblock, road block, road blocked, road drama, road issue, standstill, traffic, traffic delay, traffic jam, truck crash, truck dame, truck issue...


Dashboard > Traffic in Highways
Unread messages
last 24 hours
Messages 6
Visuals 1
Map 2
Selection
Highways
Traffic
Julie Alexander
27 March, 07:09 PM (1m ago)
Truck carrying frozen chicken crashed at #A1 #frozen #chickens
Highways
Traffic
Sarah Alvarez
27 March, 07:05 PM (5m ago)
There's a truck accident on A1 and I need you to go check it out. There's free chicken
Luke Steele
27 March, 07:02 PM (8m ago)
There are frozen chickens everywhere #accident #Amsterdam
Rosalie Toonen
27 March, 07:01 PM (9m ago)


Unread messages
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There are frozen chick
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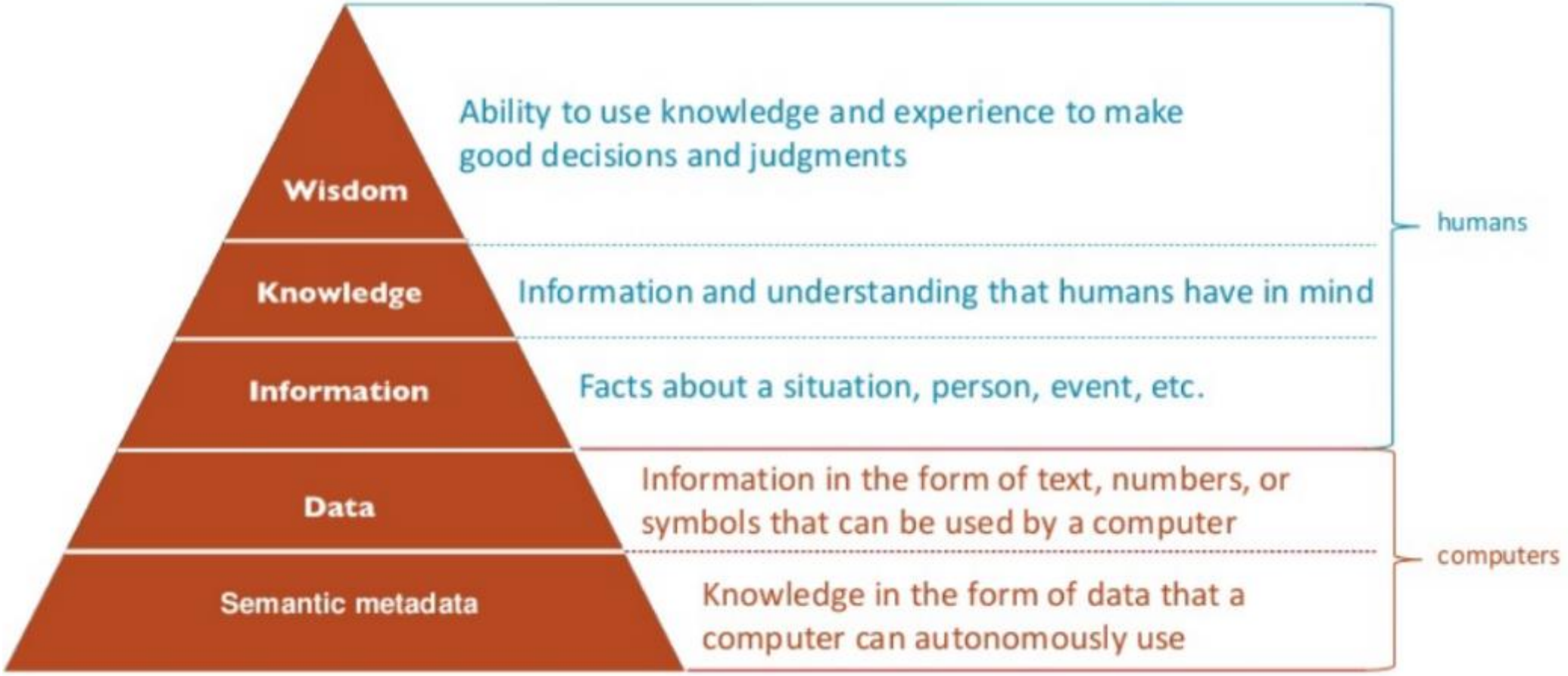
DIKW Paradigm – How does it apply to the Control Room Today?



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Embedding AI & Machine Learning into the Control Room

- Consider the size of the data we already collectively work with
- Now imagine a time in our near future when a computer's flawless memory and calculation are available to the very real and human call-taker, first responder, or city planner
- Using **artificial intelligence (AI)** and **machine learning (ML)** these future systems will recognize patterns that a human didn't even know existed, and do it instantly as soon as the call is received
- Collecting more and better data and integrating it is the first step in becoming a "Safe City" (we already do this), but…

…**embedding** sophisticated AI and ML into the equation allows recommendations to be made **automatically** and in **real-time** to help augment the humans working an incident

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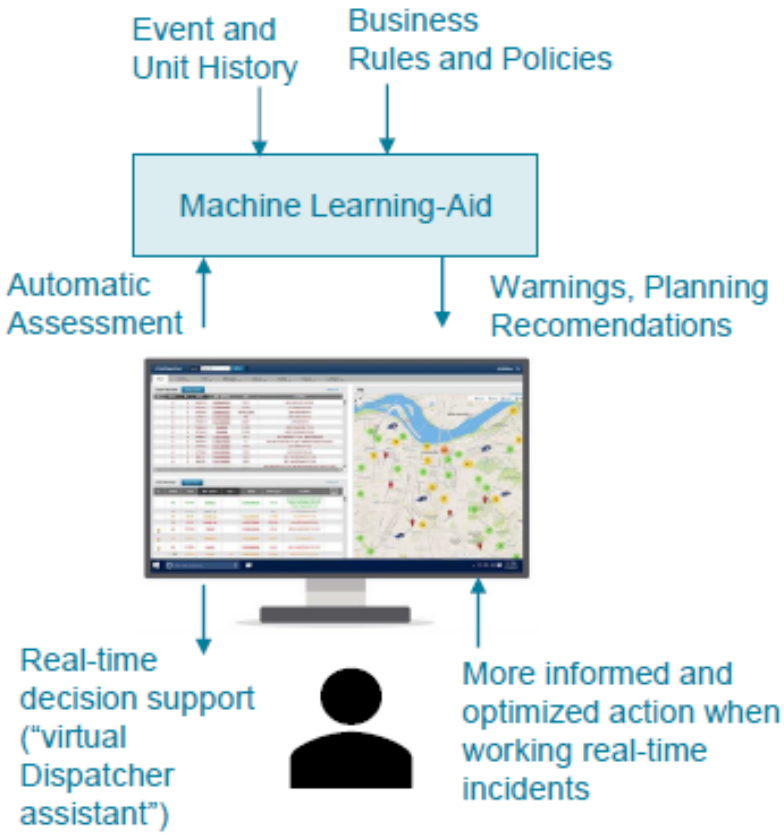
… will lead to much greater Automation in the Control Room

In less than 5 years Control Room Systems will be leveraging AI & ML to automatically

- Provide crime scene/search-and-rescue prioritization and resource allocation
- Coordinate communications with all entities involved in an incident
- Predict where and when crimes are more likely to happen and who may commit them
- Develop intelligent simulations for training law enforcement personnel to collaborate
- Augment overwhelmed dispatch centers for major disasters by providing “call triage”
- Scan social media for illicit activity, radicalization, and activity of large gatherings
- Provide advanced techniques, like vision, speech analysis, and gait analysis, to aid interviewers, interrogators, and security guards
- Provide intelligence surveillance via drones, robots, and cameras
- Recommend Q&A patterns to call-takers to extract the most information
- Perform Natural Language Process (NLP) to better “understand” the meaning or intent of unstructured language



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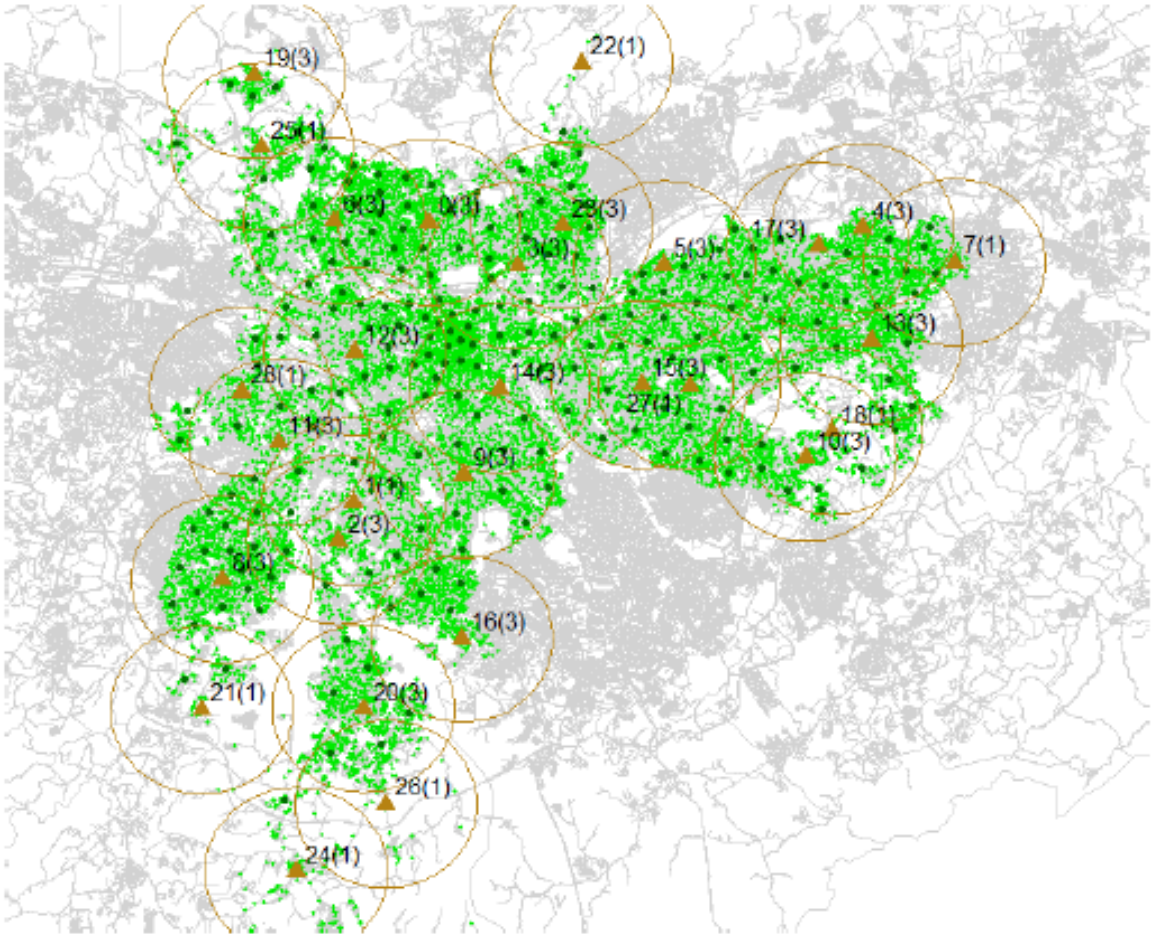
Candidate 1: Deployment / Resource Planning

- Utilize historic data (+ external sources) to provide optimized deployment planning or staging recommendations based on trends
- Model can predict the locations where units will most likely need to be
- Machine learning is able to find optimal and near-optimal solutions to problems of this type



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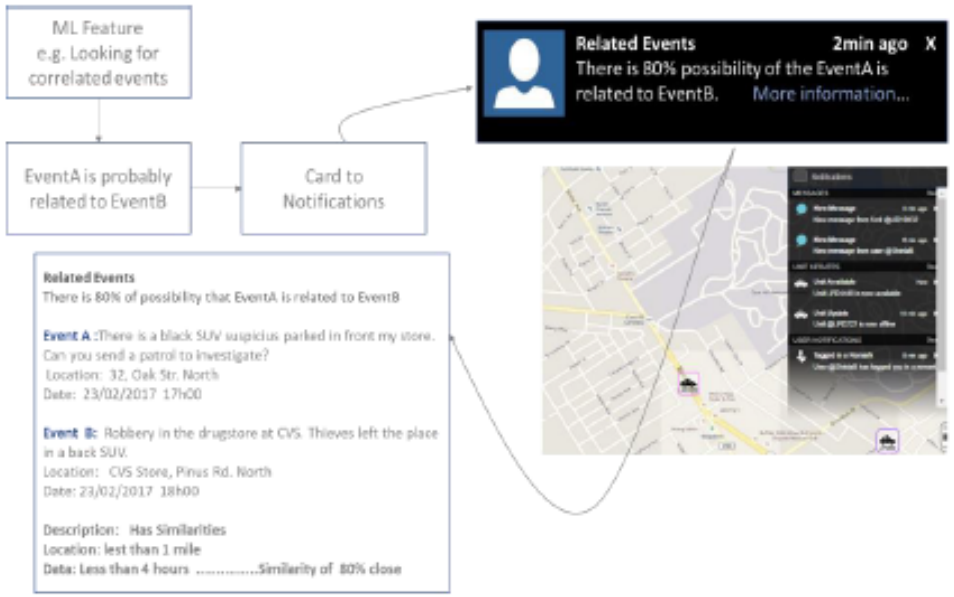
Candidate 2: Event Pattern Analysis



- Find patterns and links between events
  - Utilize historical CAD data
    - Future: could be extended with data from RMS and other external sources
  - Utilize text/keyword analysis to infer potentially unobvious relationships between events
- Through a dashboard/monitor (or OnCall notifications), display these potential linked events and other information that may be relevant to the call-taker
- Could be extended for **Major Event Prediction** module/workflow

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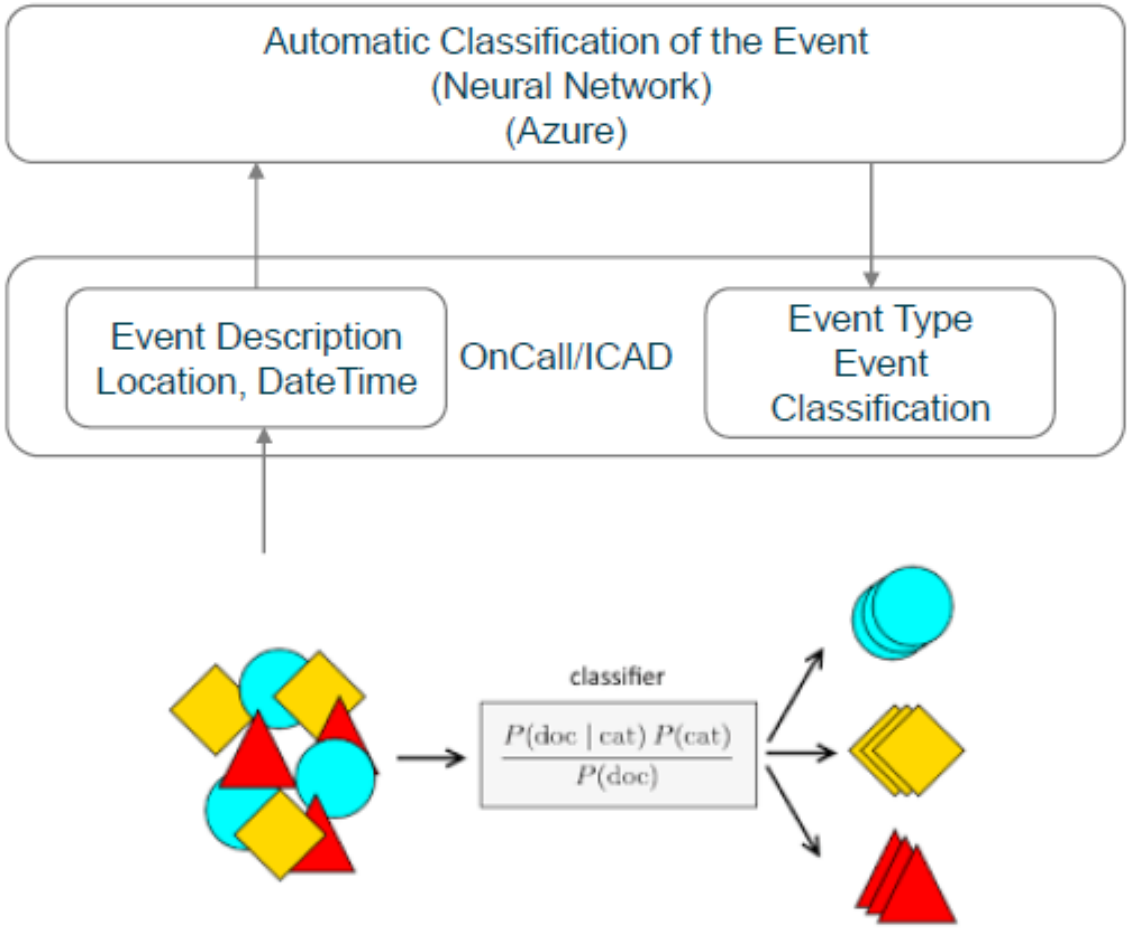
Candidate 3: Automatic Event Classification

- Utilize event description and other data to help call takers classify the event (event type, priority, urgency, etc.)
- Create and train a classifier (Bayesian, Neural Network, …) to make this classification with some historical data
  - Would need trained for each site and require access to necessary event data
- Subset of **Command-line Auto-Complete** candidate
  - Possibly more globally applicable



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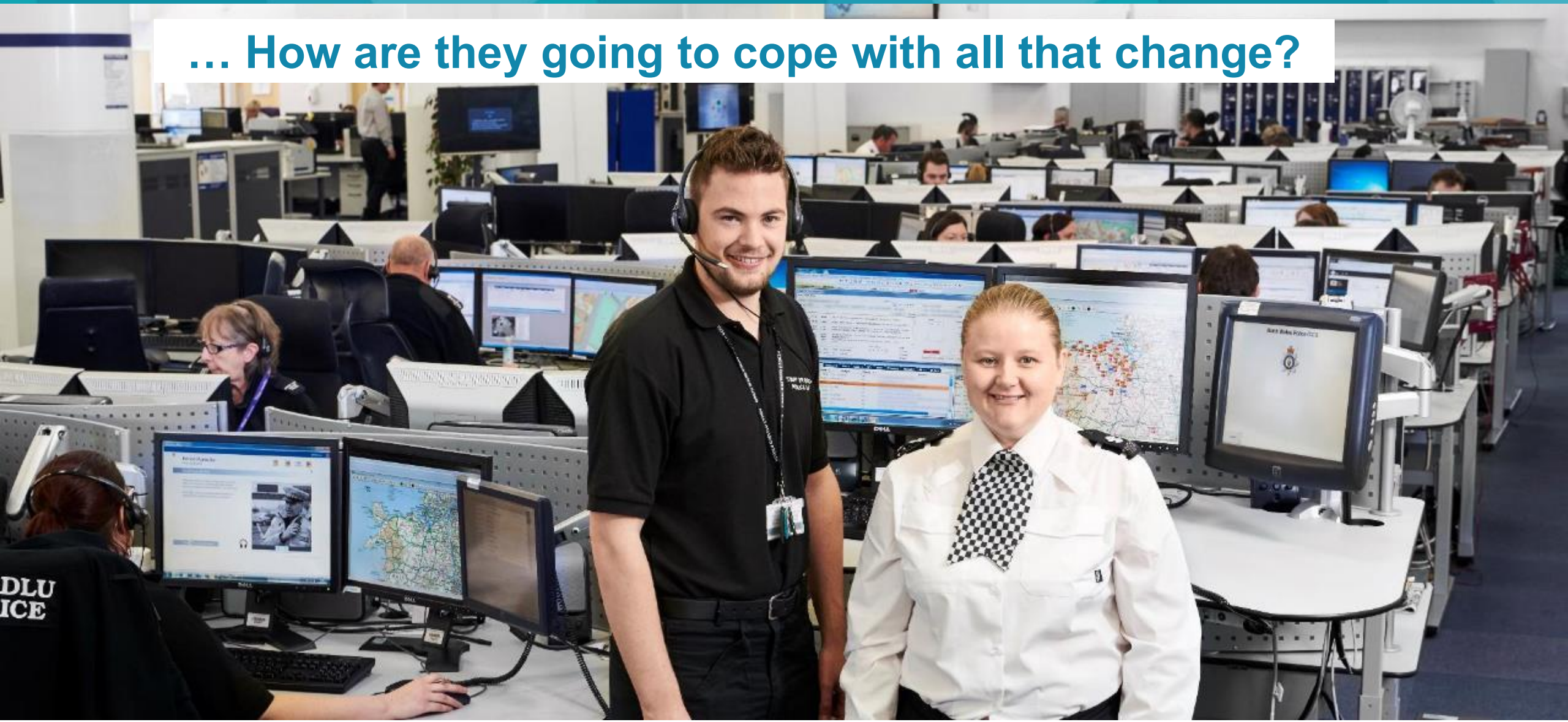
… How are they going to cope with all that change?



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Managing Change

- In Reality it won't all come at once
- Dual Economy of Old & New – Old ways won't be replaced completely
- Horses for Courses – selective training packages
  - Identify those that are 'up for it' and want to shape change – Evangelists
  - Identify those that will be challenged – Extra Training
  - Identify those that will cause trouble – Manage their issues and corral their complaints

- What is Changing and Why?
  - Management must communicate this Firmly and Clearly - no debate.
- How should the change be achieved – Let the Users decide (with a budget)

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Remote working

- Working from Home
  - Flexibility for the staff
  - Reduce costs to staff
  - Reduce costs to the Emergency Services
  - Scale to manage peeks in call demand
  - Resilience for the Public Service when staff can’t get into work – floods, traffic, epidemic
- Business Continuity and Disaster Recovery Options
- Buddy Arrangements with other services
  - Help take Calls in peek periods – transfer the incidents electronically
  - Reduce costs and improve health by reducing Night Shift work by ‘Buddying Up’ with an Antipodean service! Is that possible?

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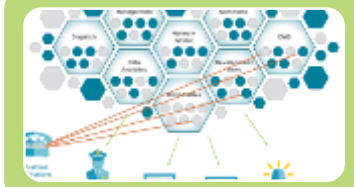

What does that mean for Control Room Systems and Suppliers?

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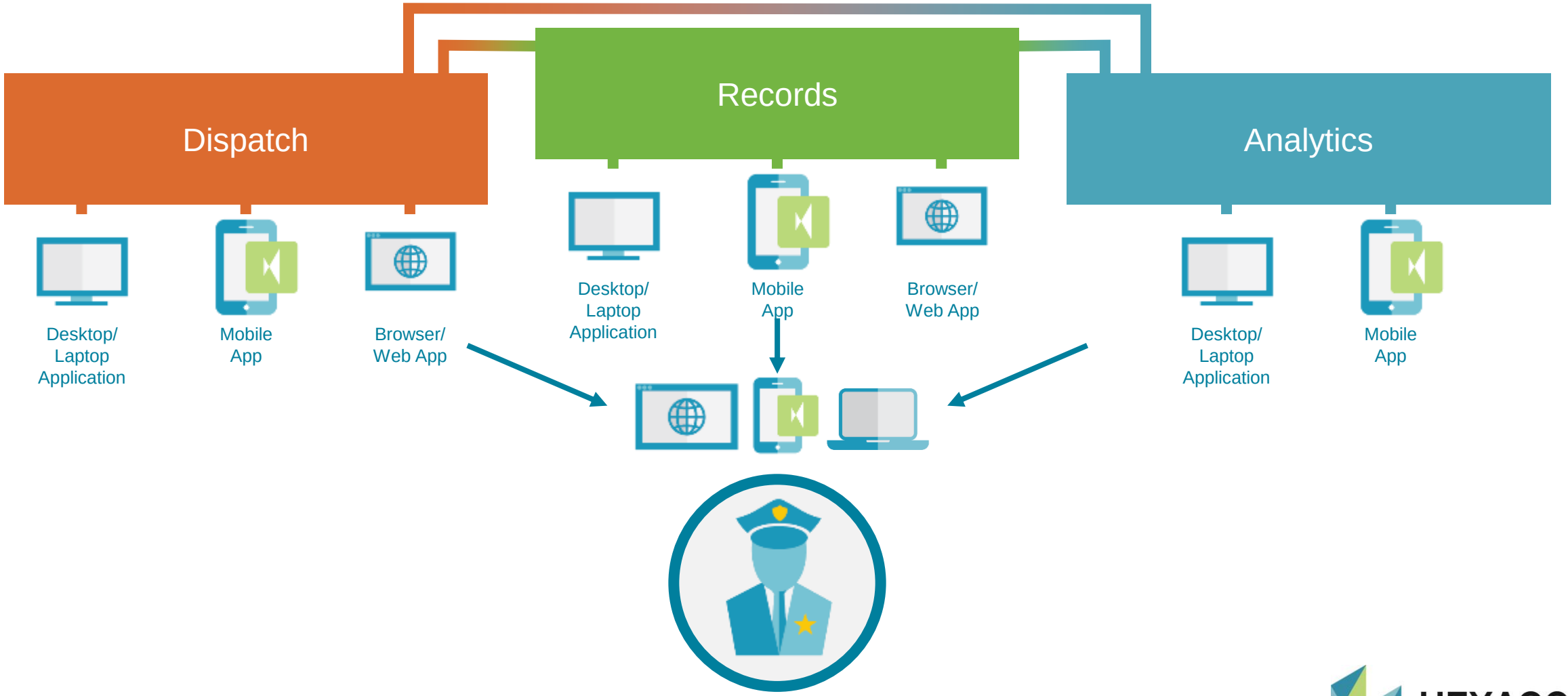
Break down current Functional Silos



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New Strategy

Data
+ Capabilities
+ Workflow
+ User Interfaces

Components combine
to deliver a solution

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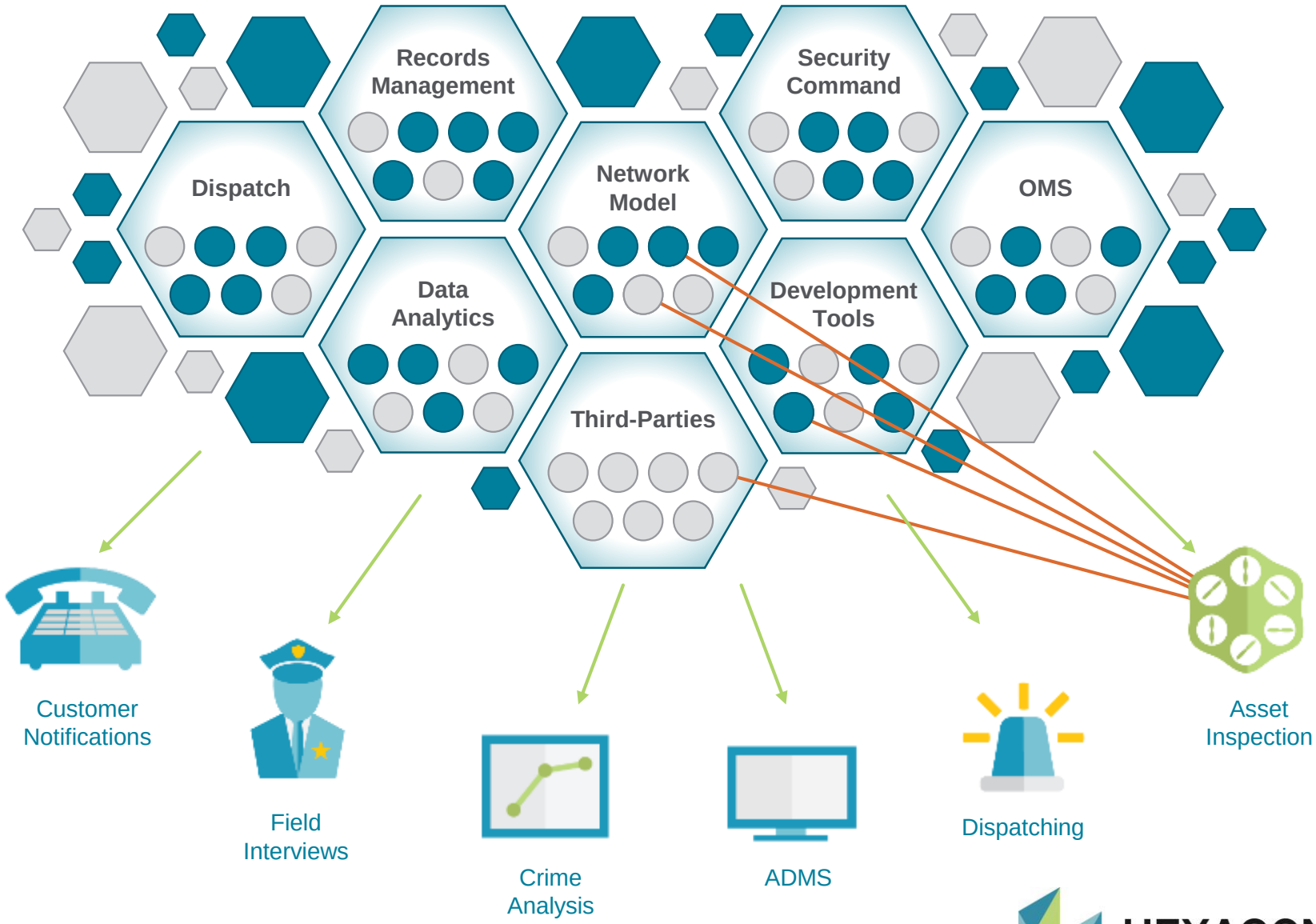
New Thinking

- A Solution partnership
  - Suppliers co-exist with each other and Publicly available services
  - No More Silos
  - Plug into Enterprise Service Bus
- Systems more flexible to change with SDK and workflow tools
- Procurement & Replacement flexibility
  - “Plug ’n’ Play”



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Cloud Ready

"Intelligence Community, Information Technology Enterprise Strategy" US Office of the Director of National Intelligence

"Cloud is the foundation for digital transformation – it is the new core of enterprise IT" – IDC

"by 2018, security will displace cost and agility as the primary reason government agencies move to Cloud" – Gartner

"By 2017, 20% of law enforcement organizations will have invested in integrated cloud and analytics solutions to consolidate information silos and operationalize evidence-based policing." IDC

"By 2018, 50% of law enforcement organizations will use externally crowd sourced real-time citizen data for crime prevention, detection and response." IDC

"Customers should select vendors who commit to a common code-base that is structured for delivery as SaaS/PaaS" - IDC

Local (in-country) storage and hosting e.g. Microsoft now has UK and German Azure data centres.

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Current Computing Challenges

Scalability Limits

+

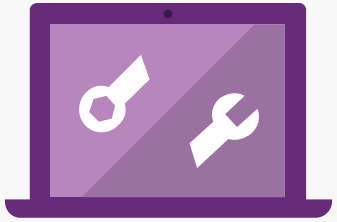
Security Management

+

High Costs

=

Business Can't Move Forward



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Solving Computing Challenges with Cloud

Limitless Scalability + Trusted + Cloud Economics = Business Agility

Only pay for what you need → When you need it → No Building, No Power, No Cooling → Staff manage the app only → Resilience & Flexibility at Scale

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In Summary

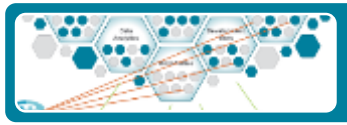

Many things driving change


Change won’t all come at once


Change will be different in different situations


Pace must be managed to a human level to succeed


Make Citizen the focus to succeed - not the incident


Technology will support change as well as drive it

Embrace Cloud or Hybrid Cloud for Scale & Security

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Thank You

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