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BACK TO THE FUTURE OF ELECTRONIC MONITORING

BREAKING THE GLASS CEILING OF EM TECHNOLOGY

AGENDA

- Snapshot of current status
- Location tracking – what about indoor location?
- Moving from data to information – changing approach to EM app
- Demand-driven innovation – standards for EM
- Implications (next years)

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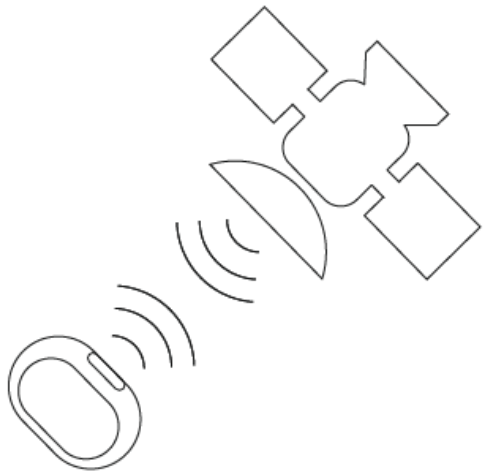
SNAPSHOT OF THE CURRENT STATUS



LOCATION TRACKING

- Potentially best technology for crime prevention and investigation, as well as rehabilitation and offender management
- Location tracking – “GPS”, still doesn't meet the needs

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SNAPSHOT OF THE CURRENT STATUS

EM APPLICATION

- Too much data, not enough information
- Requires too much human intervention and professional services
- **EM application MUST provide INFORMATION, support automation and ease decisions**

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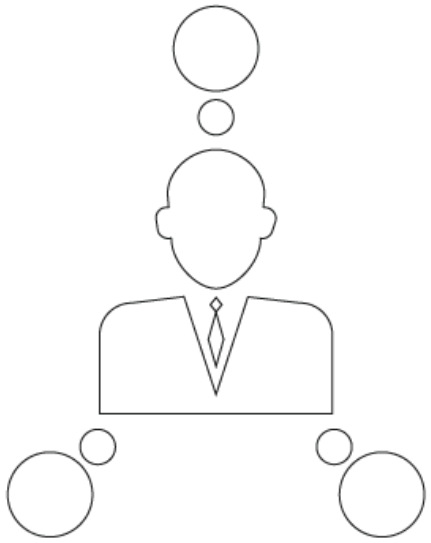
SNAPSHOT OF THE CURRENT STATUS



VENDOR DEPENDENCY

- A single vendor provides all of the system components
- Vendor dependency leads to the mediocracy, stagnation and high solutions cost; the customers pay the price

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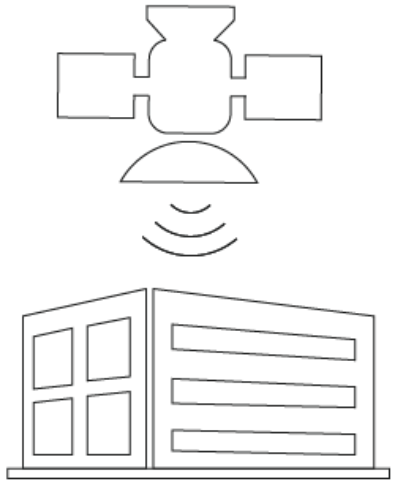
MOVING FORWARD WITH LOCATION TRACKING



LOCATION: GPS ISSUES

- GPS Availability – almost solely outdoors; average availability is less than 50% of the time
- Indoor location improvements are driven by the mobile industry (commercial goals) and by the FCC E911 and EU regulations.
- EM should have the benefits from these efforts
- Need to involve other means of geolocation: Triangulation of LBS, BT, dead reckoning and WiFi

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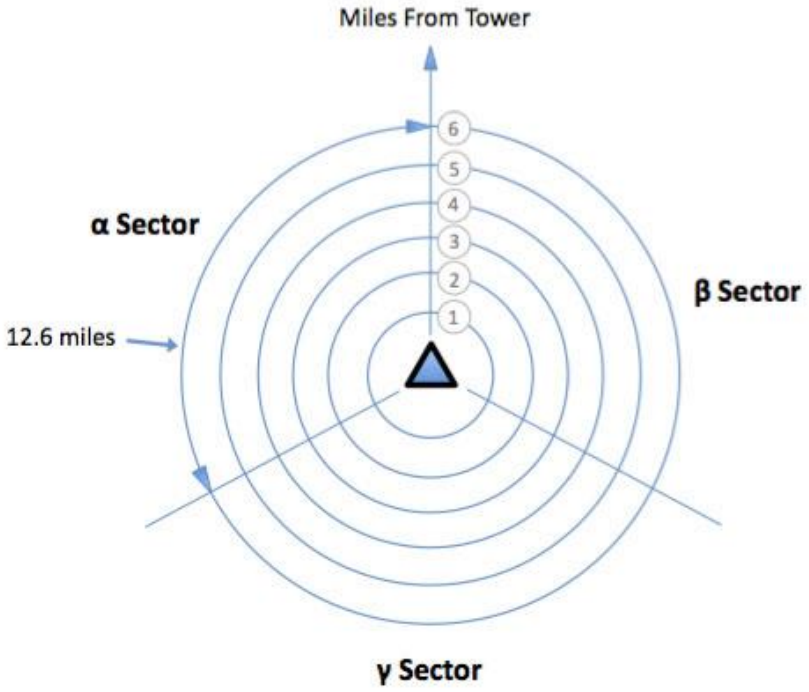
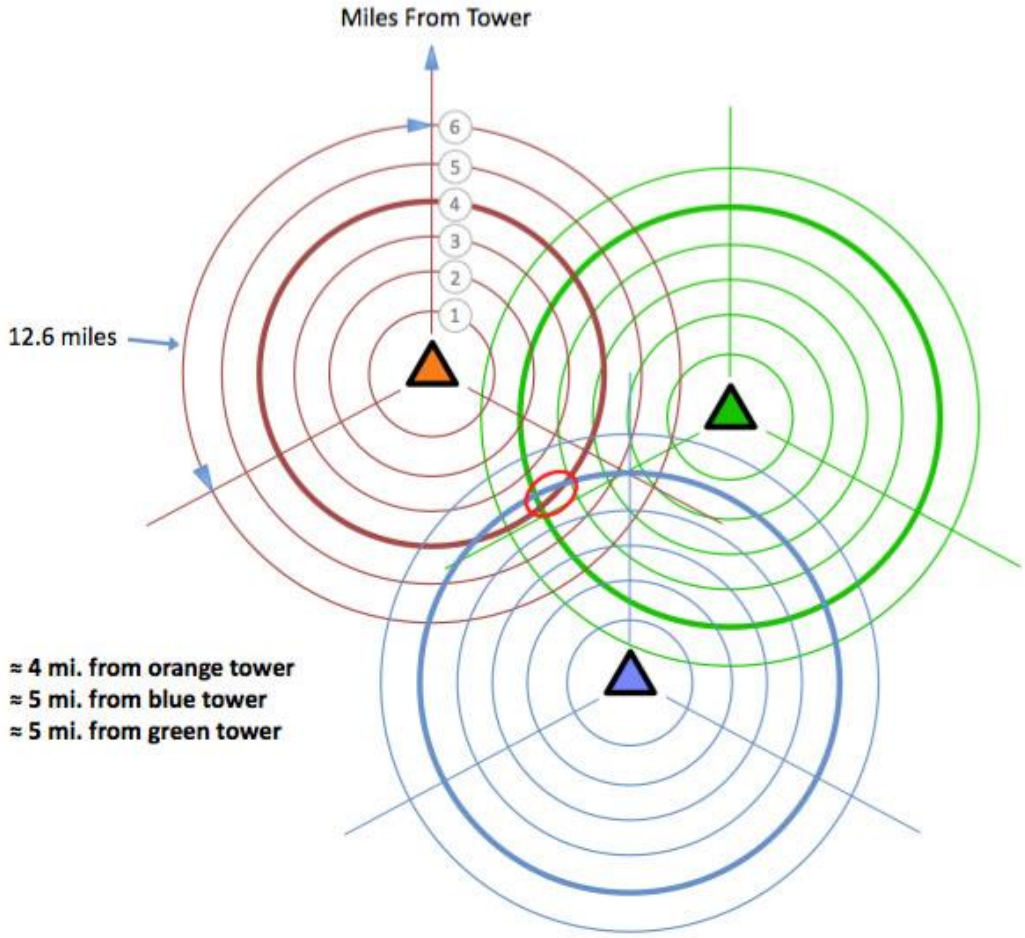
WHAT IS CELL TOWER LOCATION?





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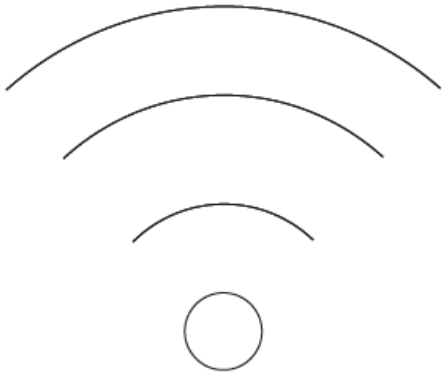
LOCATION TRACKING: IMPROVEMENTS



WIFI

- WiFi – a significant trend in indoor location
- Wifi is available where GPS isn’t and vice versa
- Significant WiFi data-bases are available
- WiFi constellation is built from more than a single AP
- No need to connect to the WiFi network, no privacy issues

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LOCATION TRACKING: PDR, WIFI

Tokyo Station test:

- Wi-Fi
- PDR
- SiRFusion output

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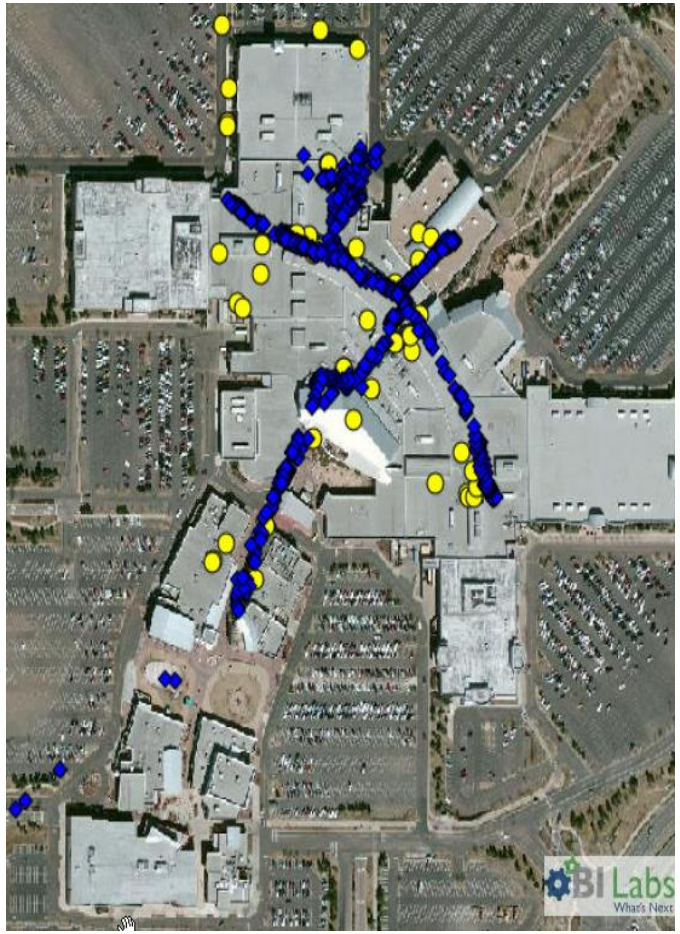
LOCATION TRACKING: WIFI



Data collected during a walk through a shopping mall:

- WiFi locations
- GPS points

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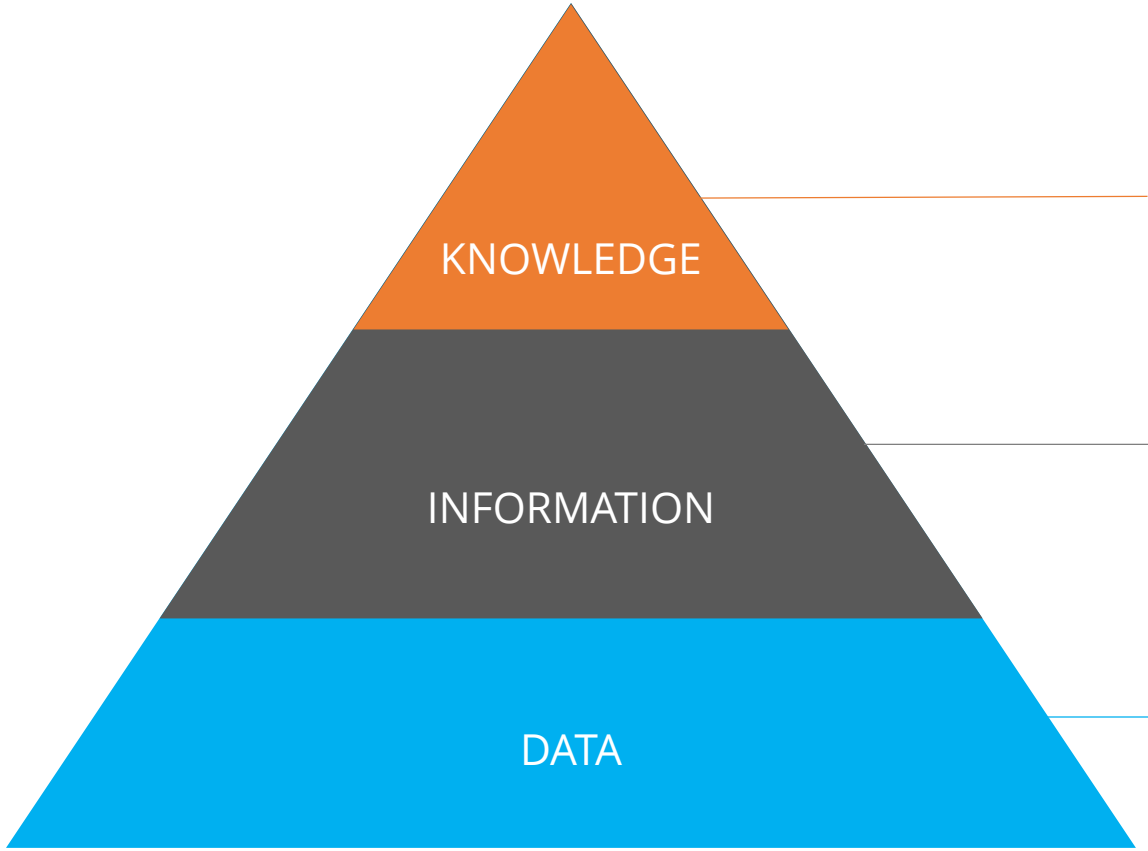
FROM DATA TO INFORMATION



Know-how, understanding, experience, insight, intuition and contextualized information

Contextualized, categorized, calculated and condensed data

Facts and figures which relay something specific, but aren't not organized in any way

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WHY DO WE NEED TO MOVE TO INFORMATION?

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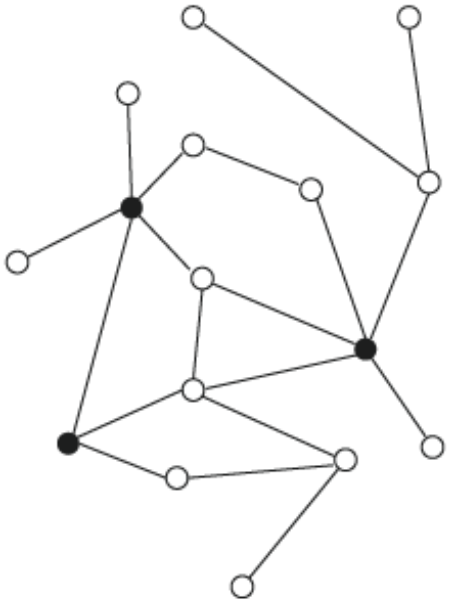
FROM DATA TO INFORMATION



Today:

- Operators need to deal with too many events
- Many events are meaningless without context
- Human brain is needed everywhere – no automation

We need to have clear conclusions based on the events - Information

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FROM DATA TO INFORMATION

How do we move to information?

- Data = events as they are now
- Information = incident, a logical sequence of events, actions and responses
- Actions and responses will be proposed from a pre-defined list. Some of the actions can be automated
- Educated decisions by the system: continuous movements AND AC power lost
- Incidents definition should be structured like Lego bricks

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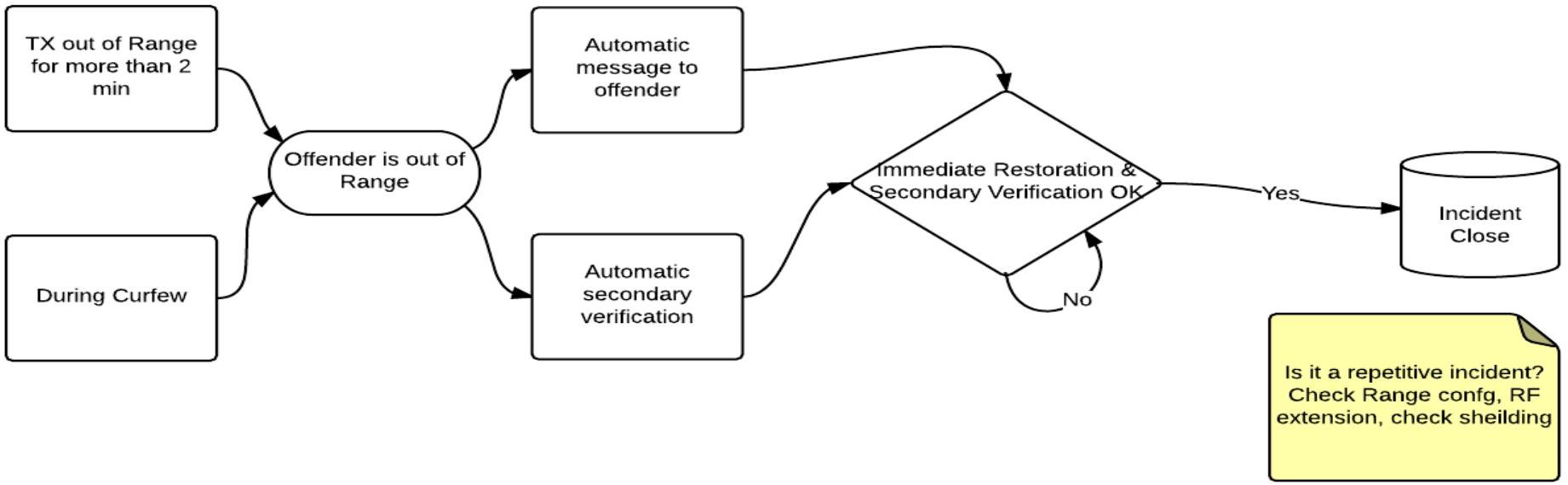
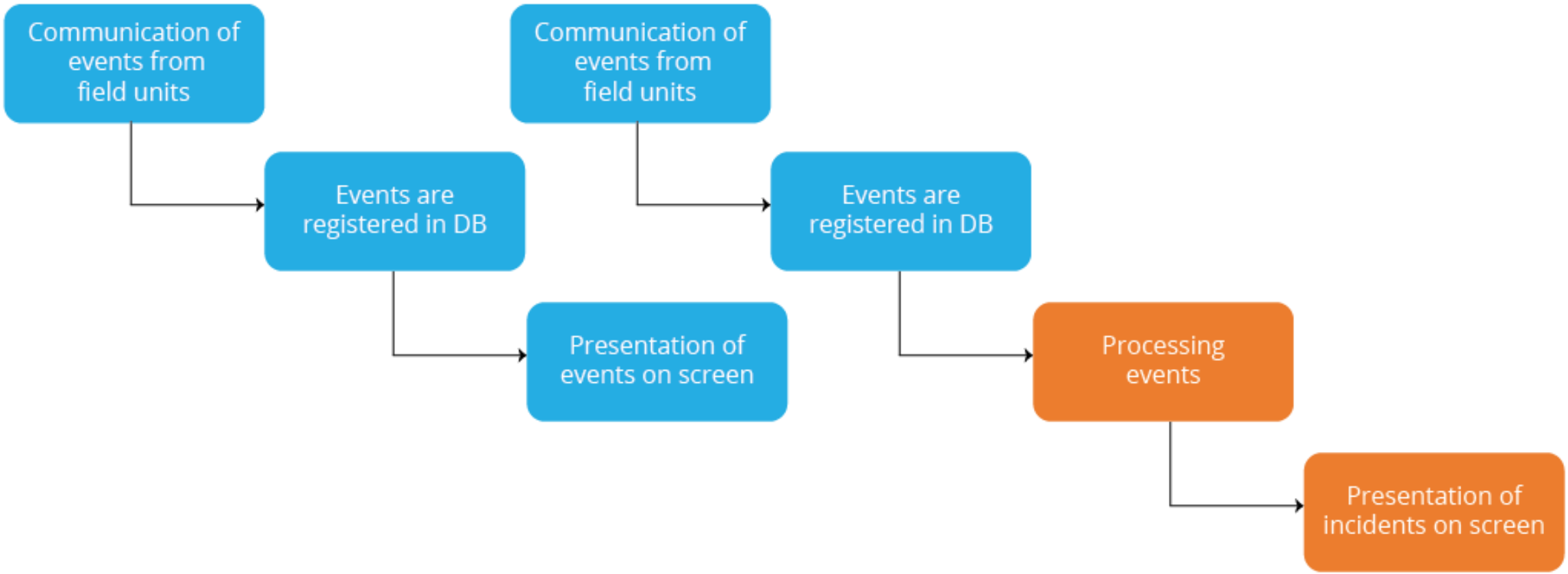
EXAMPLES OF INCIDENTS

- Continuous movements AND AC power lost = HU has changed place
- Offender is out of Range





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DEMAND-DRIVEN INNOVATION: STANDARDS FOR EM

What do EM customers need?

- Interoperability between EM system component of different vendors
- “Best of Breed” approach, enabling technological and service excellence
- Ability to adopt new markets solutions and stimulate competition
- Improved performance, quality and safety
- Improved trust – expanded EM scope

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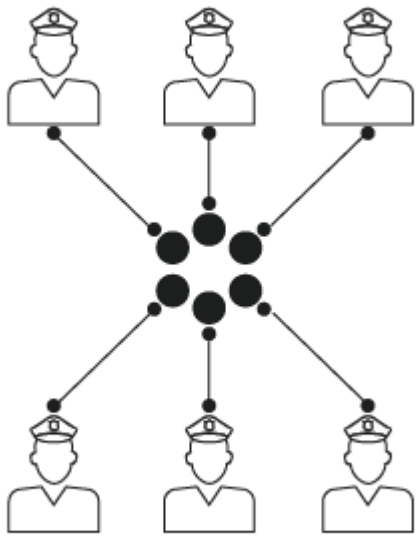
STANDARD REQUIREMENTS



- Interfaces between field units and backend – communication and protocols
- Technical requirements for all entities (field units, application, failover, etc.)
- Safety requirements
- Quality measurements
- Compliance measurements

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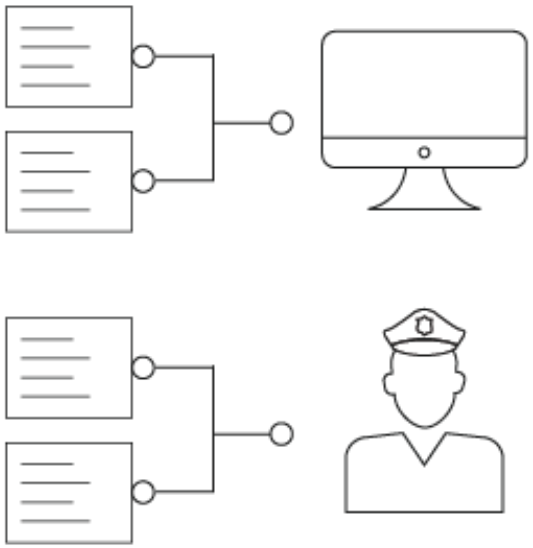
THE HIGHLIGHTS



Location tracking:

- Reliable indoor location is a **must**
- WiFi looks like the right direction for indoor location

EM Application should:

- Present meaningful information and support automation
- Reduce staff intervention → Reduce MC staff overload

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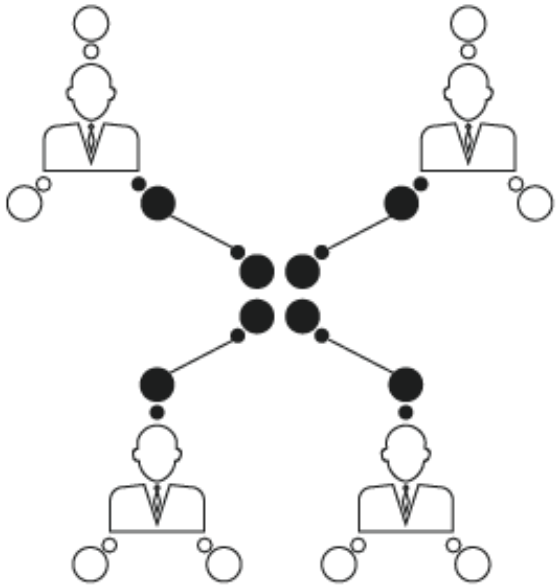
THE HIGHLIGHTS



Vendor dependency:

- The OECD estimates that standards and standard conformity directly affect roughly 80 percent of all world trade (STANDARDS AND CONFORMITY ASSESSMENT IN TRADE: MINIMISING BARRIERS AND MAXIMISING BENEFITS , https://www.oecd.org/trade/ntm/36223999.pdf)
- "…Standards also maintain choice for consumers, ensuring that several suppliers can supply similar but compatible products, maintaining competition and keeping prices low while offering a wider range of choices in any one category.

(Dr Konstantinos Karachalios, MD of IEEE-SA, https://www.epo.org/news-issues/issues/standards.html)

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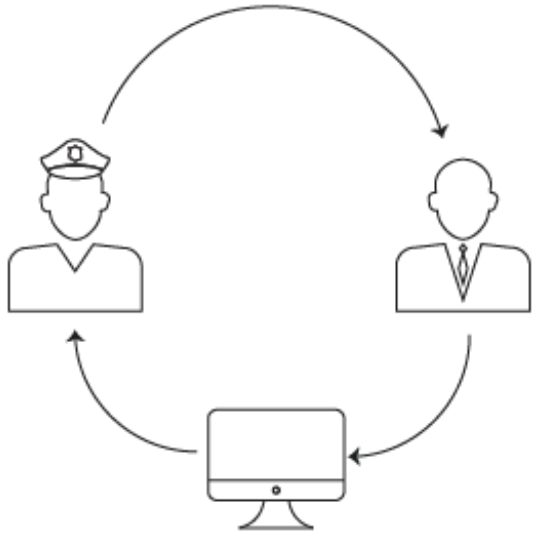
THE HIGHLIGHTS



Customers should be part of the loop:

- Driving standards
- Solidify the answer of what we would like to get
- Give the “GPS” a chance; make pilots, solidify operational methods and feedback the vendors

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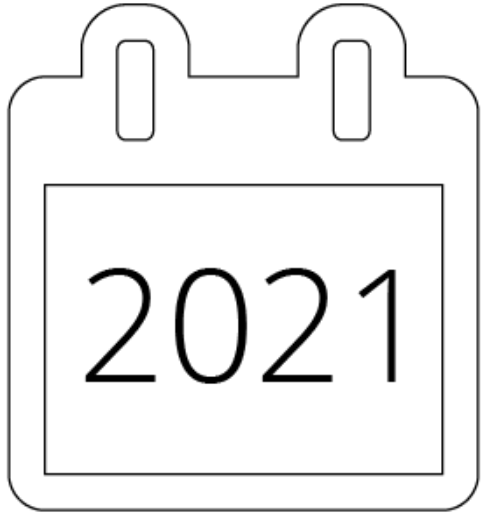
NEXT YEARS - IMPLICATIONS



- Doing the same as today will bring similar results
- Changes in customers' perspective to drive innovation and competition:
  - Standards
  - Development of the operational methods
  - Pilots
  - Accept offender as an active entity in the process?

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NEXT YEARS - IMPLICATIONS

- GPS will play a significant role in Europe as it is the solution with the most potential for crime prevention and rehabilitation
- Significant improvement of the MC efficiency
- Mixed vendors systems
- Other directions: mental identification, ID tags, tags for a variety of offender profiles
- Smartphones with/without tags

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NEXT YEARS - IMPLICATIONS

- Face and environment verification
- Machine and deep learning – as a tool for anomaly detection
- Better reporting and analytical capabilities
- Short period contracts – driving innovation
- Battery charging will still be needed
- EM will be part of the IoT & safe cities industry?
- Will RF tags for HD be replaced by location tracking devices?

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THANK YOU FOR LISTENING!

NIR SHELLY | MANAGING DIRECTOR
NIR.SHELLY@EM-IS.COM
HTTP://EM-IS.COM