

Integrating & Synthesizing Data for Perimeter Security Awareness

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- Integrated Electronic Security Systems As A Market Vertical and Line of Business since 1991
- Major Supplier of Integrated Security Solutions to Department of Defense; Department of Transportation; Department of Homeland Security; Large Airports and other Critical Infrastructure throughout the world.
- Focus is complex large solutions and intelligent systems that integrate cross-functional stakeholders
 - **Horizontal Integration; Common Operational Picture; Information for Use**
 - HI-View™ Framework to enable improved situational awareness, incident response and recovery.

- A definition of terms:
 - “*Data Fusion is an Information Process dealing with the:*
 - *association, correlation, and combination of data and information from*
 - *single and multiple sensors or sources to achieve*
 - *refined estimates of parameters, characteristics, events, and behaviors for observed entities in an observed field of view*
- It is sometimes implemented as a Fully Automatic process or as a **Human-Aiding process** for Analysis and/or Decision Support

Source: *An Introduction Data and Information Fusion*, 2001,
Dr. James Llinas, SUNY Buffalo

Current Technology State – IDS/ACS

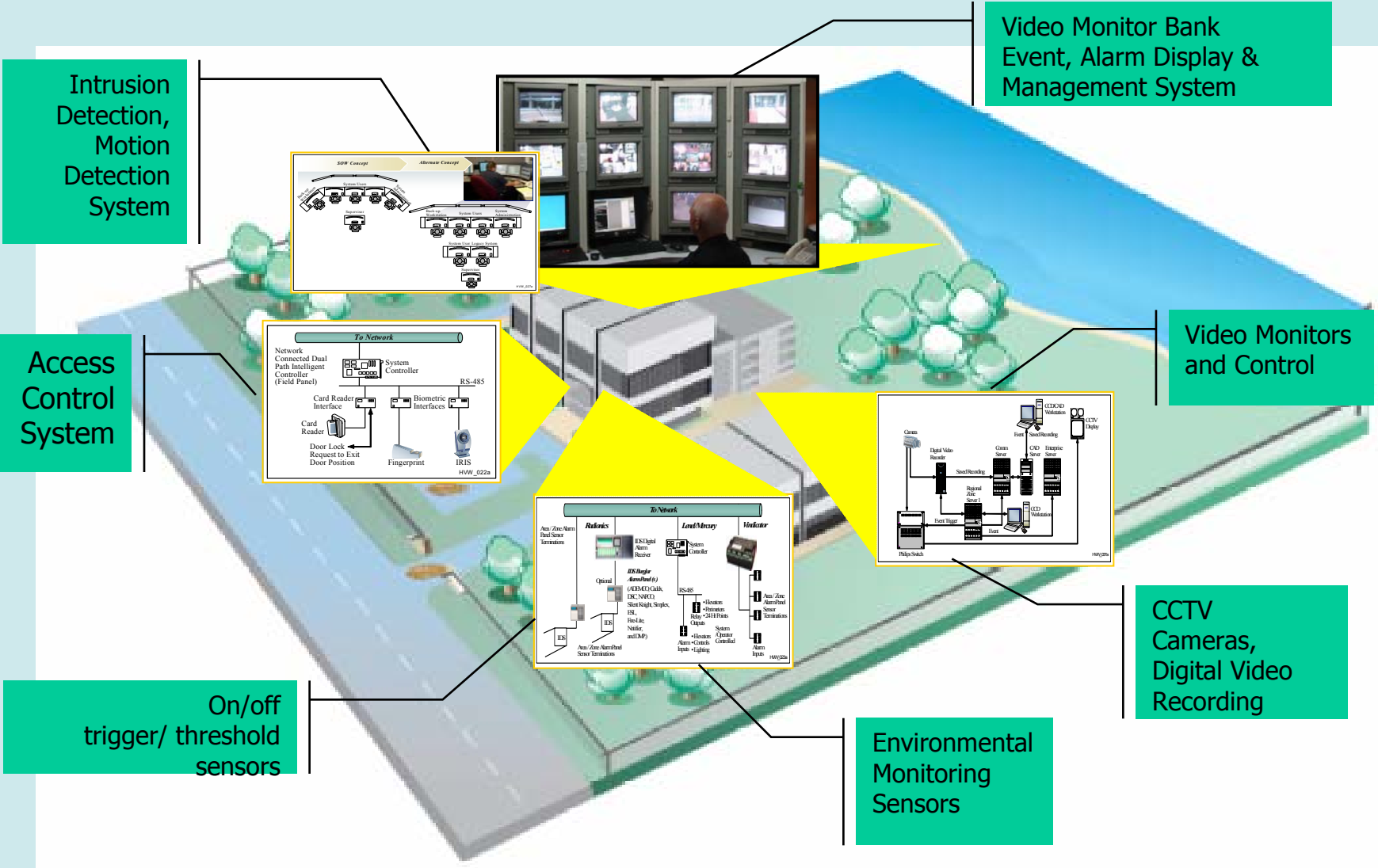
“Console Integration”



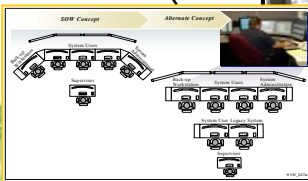
- **Based on basic access control & burglar alarm system concepts**
- **Alarms are simple on/off events**
 - **Door/window open**
 - **Motion sensor trigger**
 - **Photo-electric Beam contact break**
 - **Temperature, smoke, or water threshold exceeded**
- **Access control implemented with mag strip/proximity, or smart card badges**
- **Alarm monitoring based on text queues and icons displayed on maps**
- **Multiple CCTV monitors for remote observation**

- **Relay Solely on the Operator to Provide Intelligence and Analysis of the Data**

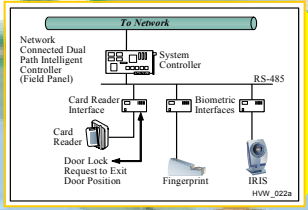
Current Intrusion Detection Security Systems



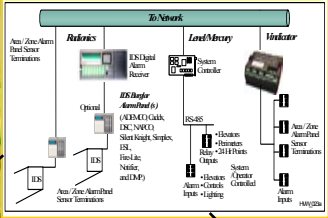
Intrusion Detection, Motion Detection System



Access Control System



On/off trigger/threshold sensors

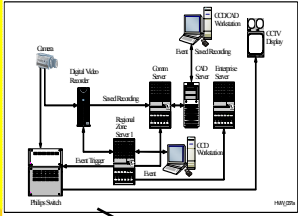


Environmental Monitoring Sensors

Video Monitor Bank Event, Alarm Display & Management System



Video Monitors and Control



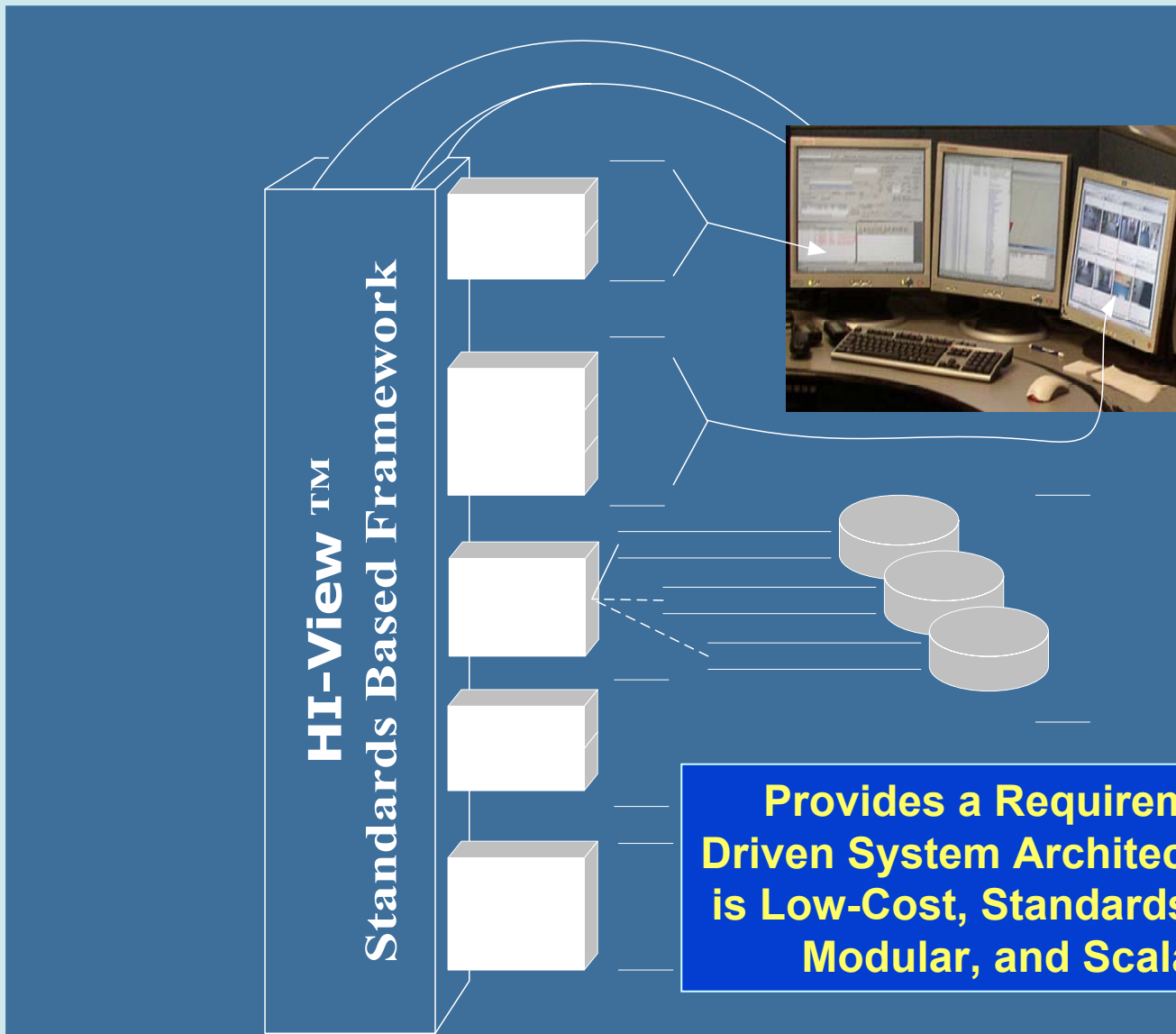
CCTV Cameras, Digital Video Recording

Lockheed Martin's Intrusion Detection & Security System Vision

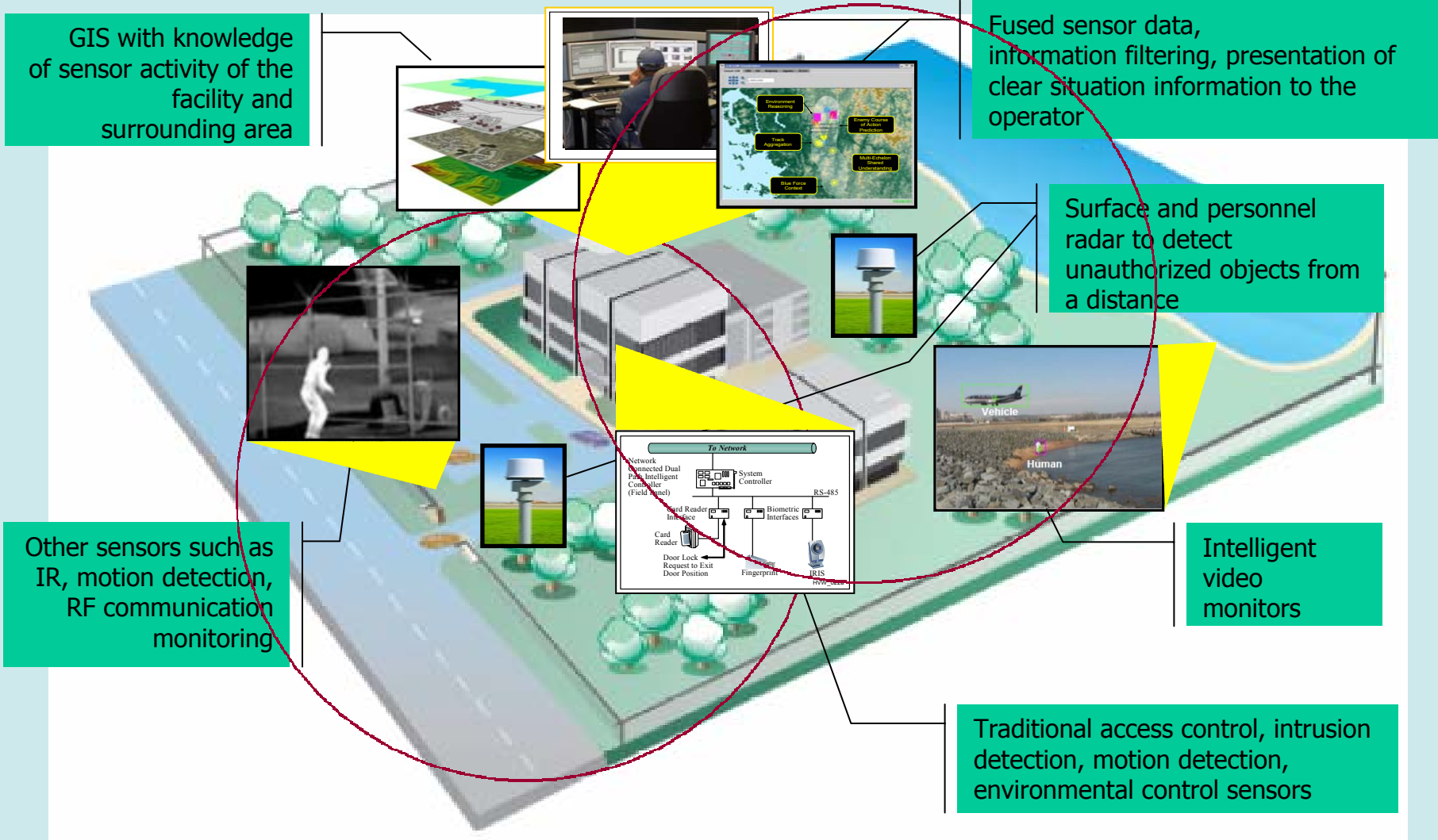


- **Smarter, more diverse sets of sensors**
 - **Radar, IR sensors, motion and non-motion sensors, RF spectrum scanners**
- **Intelligent Video**
 - **Able to “watch” area in view and report alarm or exception conditions**
- **Integration of GIS knowledge based, rules-based decision engines and Computer-aided Dispatch (CAD) applications**
- **Data Fused at the sensor and data layer level to create easily understood actionable information.**
 - **More powerful user interface than traditional security systems that integrates dispatch and security management data into a single platform**
 - **Capable of supporting emergency operations and a command and control hierarchy.**

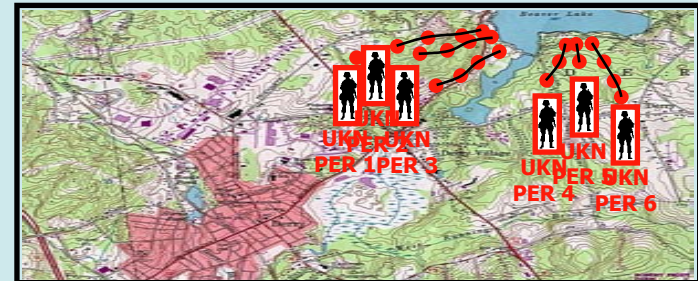
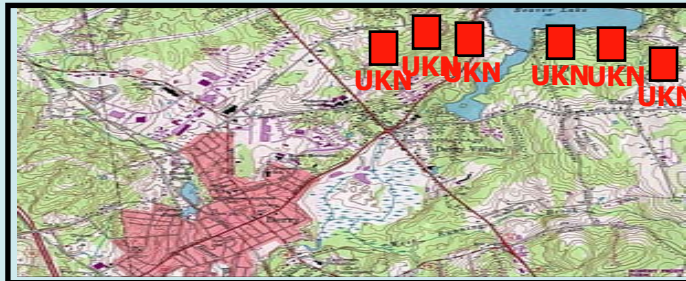
HI View™ Modular Security Command & Control Model



Lockheed Martin's Intrusion Detection & Security System Vision

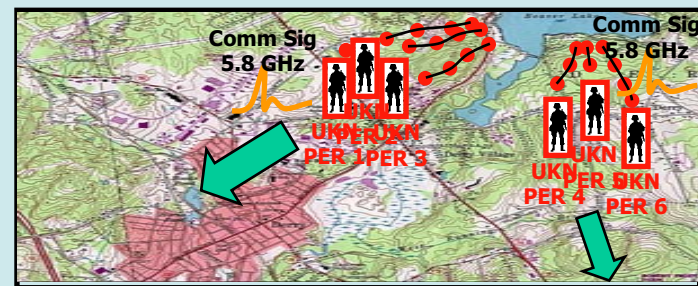


A Simple Data Fusion Example



1. Motion sensors, radar, and IR sensors detect several objects in unauthorized places. Sensor data fusion indicates there is a 96% likelihood that the objects are people.

2. The system tags the entities and using its GIS capability, tracks them and displays their tracks on the facility map.



3. From an RF scan analysis, similar unauthorized radio frequencies are detected in the vicinity of the Intruders, indicating there is an 88% likelihood the intruders are part of an organized unit

4. A kinematic analysis of the tracks suggests that one group is heading toward the electrical switching substation and the other group is heading toward a hazardous materials warehouse.

Conclusion – The Issue At Hand



- None of These Ideas or Technologies Are Capable of Being Evaluated Against Any of The Standard's In Effect Today
 - Many, Many Functional Users Agree the Capabilities Are Needed and the Concepts Described Provide Real Functional Benefits.
 - These Technologies Were Not Conceivable, Let Alone In the Realm of “The Possible” When Most of the Current Standards Were Written.
 - Need To Ensure The Standards We Write Today Are Focused On Measures of Effectiveness; Functional Requirements and Functional Performance Enhancement vice the Current Enabling Technology “State of the Practice”.