# Self-Guided Collaboration: A Technique to Coordinate Crisis Management Response for Homeland Defense

9th ICCRTS: Copenhagen, 2004

# The Need for Coordinated Response


- 9/11 exposed key shortcomings
- Sharing and intelligence integration
- Coordinated response capability between first responders

Challenge:

- Ops Center support to facilitate information sharing among all levels of government
- Support to NGOs

# Challenges- Effective Collaboration

"Command and control of a terrorist threat or incident is a critical function that demands a unified framework for the preparation and execution of plans and orders."*

- Response organizations at the various levels of government manage their own C2 activities differently depending on their history, complexity of the emergency situation, their capabilities, and what resources are available to them.
- Federal, state, and local authorities need to be agile, adaptable, and knowledgeable about available resources
- Creating an Operations Center dispensable to all agencies

** Excerpt from www.fema.gov/rrr/conplan/conpln4p.shtm*

# Emergency Preparedness vs. Emergency Response

# Case Study Examples

- For the purposes of this paper we examined several cases where first responders were called to situations where they faced various barriers toward coordinated action response and/or communication with other responders:
  - 9/11
  - Anthrax Mailings
  - Sniper Attacks, Washington, D.C. Metro Area

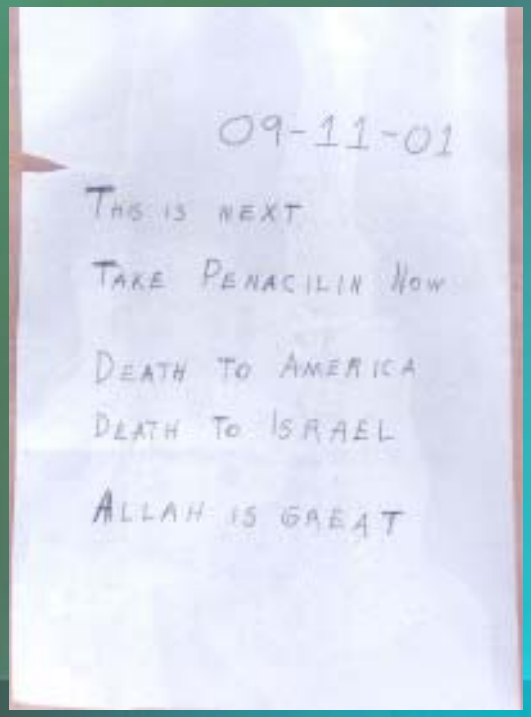
# 9/11

- Several clues to the impending attacks were available between federal and local-level agencies, but was kept in separate locals and not pieced together
  - Joint Inquiry after the attacks stated that we have not fully or effectively exploited technologies available to us
    - Lack of coordination between Intel agencies
    - Outdated and insufficient technical systems
    - Reluctance to develop/ implement new technical capabilities

# 9/11 (Cont'd)

- Other vulnerabilities were exposed
  - Holes in customs/ immigration, VISA
- Interoperability failures
  - Differing radio frequencies
- NYC emergency radio system
  - FDNY Preparedness Report
- PSWN Program: "Answering the Call: Communications Lessons Learned from the Pentagon Attack"
  - Initial responders could communicate

# Anthrax Mailings


- Letters mailed to news agencies and Senatorial Offices
- Attack highlighted weaknesses in early warning, attack intervention
- Result: information to the public poorly communicated as a result
  - No single, authoritative, coordinating source for response management

# Sniper Attacks- Washington, D.C. Metro Area

- Drew together Federal, State, and local Authorities
- Police organizations expressed concern about coordination of evidence
- Acknowledgement by Authorities of difficulty in coordinating resources
  - Deployment of security personnel to schools difficult to orchestrate

# Lessons Learned from Case Studies

- Difficulties in sharing resources related to difficulties in sharing information
- Sharing information is hindered due to lack of access to common knowledge base
- Bureaucratic silos perpetuated by classification, security, and information assurance policies
- Inability of localities and NGOs in first responder role to assist each other in equipment, supplies, and knowledge

# New Informational Paradigm

- Bust silos with horizontal sharing of information
- Communities of interest to share information
- Users to pull information from system that support their informational needs; not be dependent on that pushed to them
- Multi-level classification can still limit who has access; but users can pull from relevant information

# The Need for a Unified System

- Create system which collects vast amounts of data
- Mine that data for things of interest
- Facilitate knowledge discovery
  - detection of trends
  - discernment of anomalies
  - “Connect The Dots”

# Operations Center Description

- Maximizing Flow and Control of Information is Key

- Operations Centers are Innovative Tool To Manage Information In Time-Sensitive Environment.
- Optimized Infrastructure Which Channel Collection, Analysis, and Dissemination of Information.

# Operations Center Development Approach

1. Articulate Goals & Objectives

2. Map Decision Support Processes

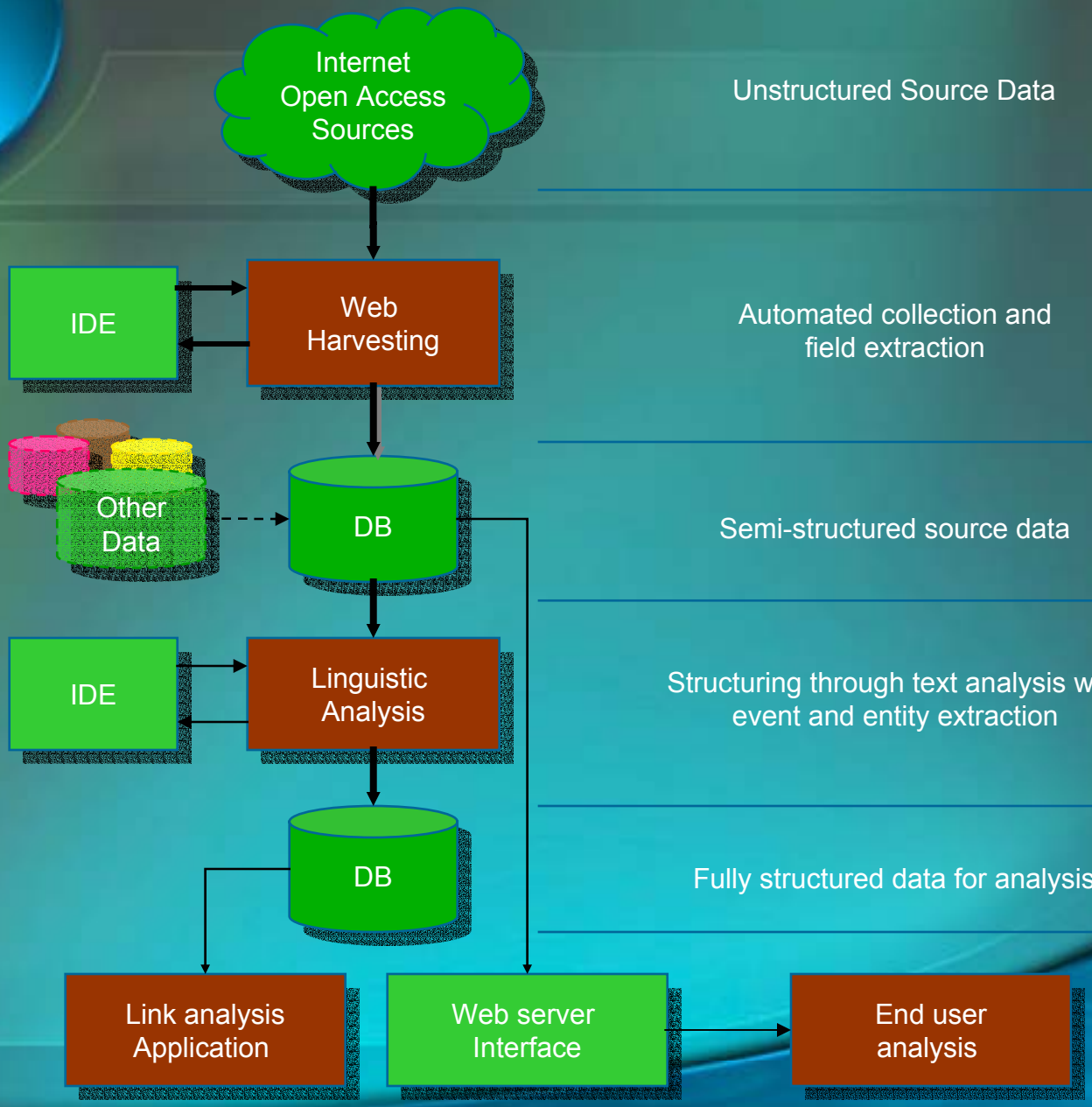
3. Determine Information Flow

4. Select Best Software That Facilitates Flow

5. Select the Best Hardware & Displays

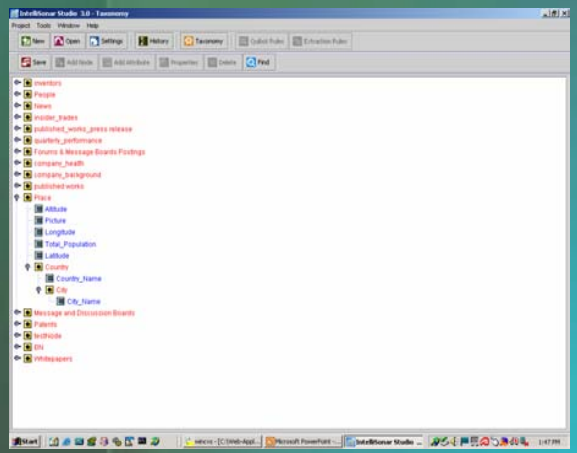
6. Optimize & Integrate System in Facility

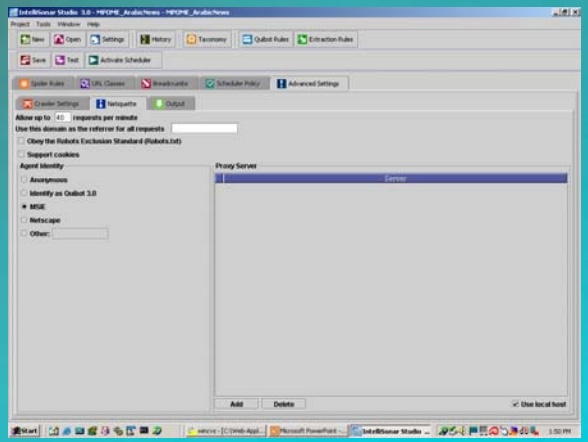
# System Process and Architecture

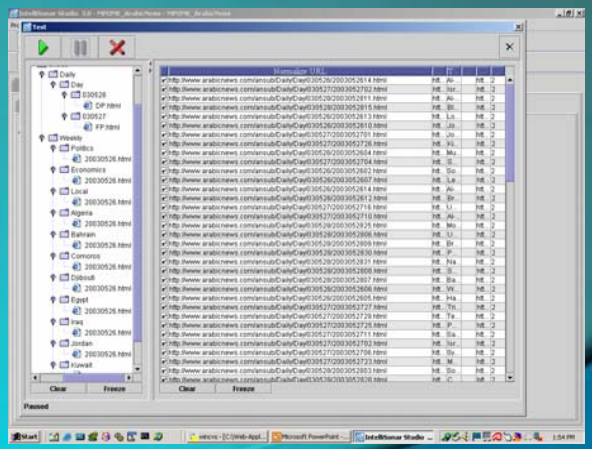


# Web Harvesting

- Efficiently collects data and imposes preliminary structure
  - Input – Web pages
  - Output - labeled text blocks

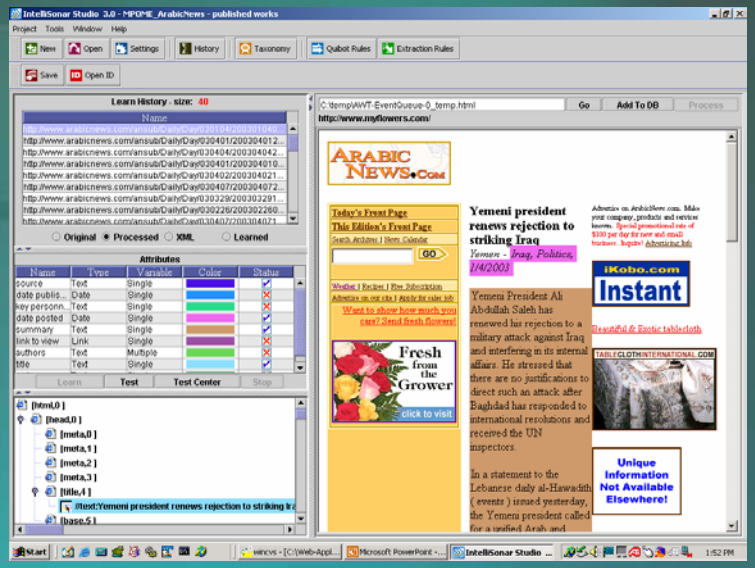


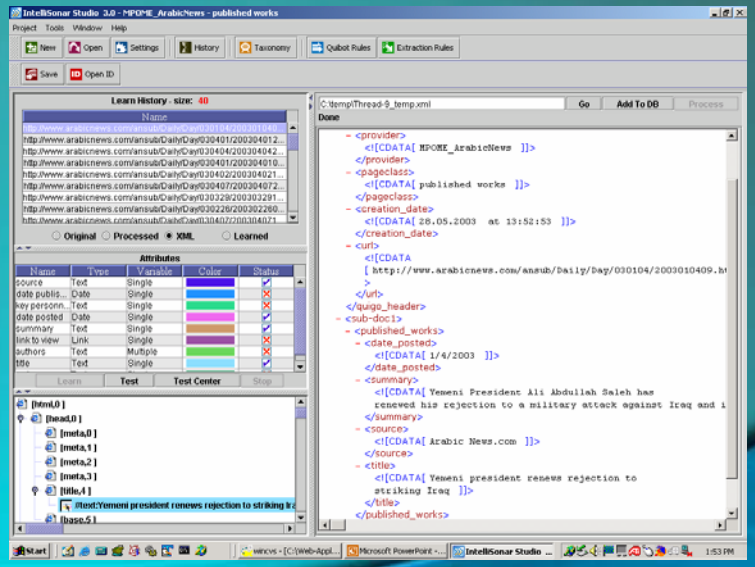




# Web Harvesting Capability

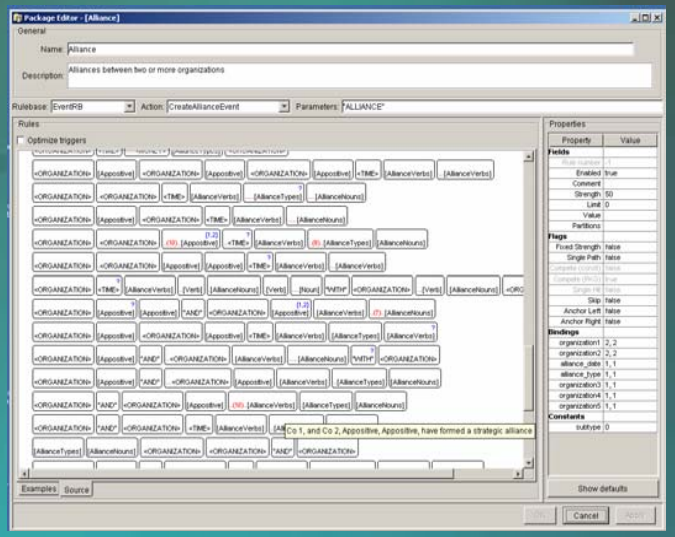
- Major Tool: Quigo IntelliSonar
- Crawls Web sites, extracts labels and text blocks
- Features
  - Intelligent text block identification
  - Anonimization
  - User defined crawl parameters
  - Ongoing 24 hour monitoring

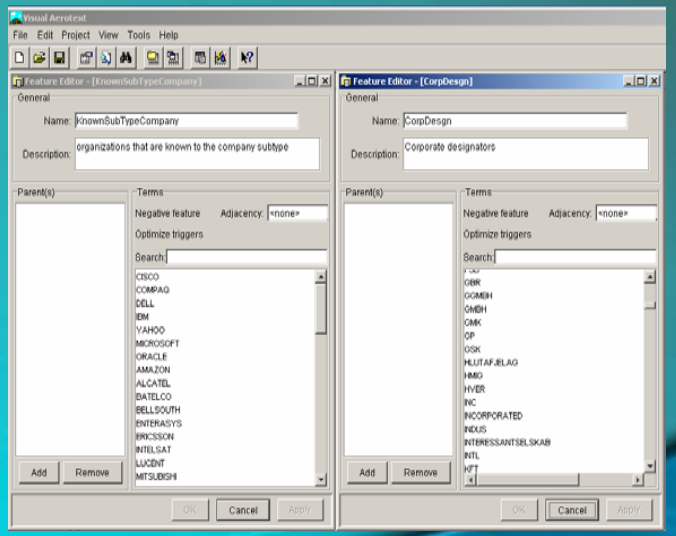


# Linguistic Analysis

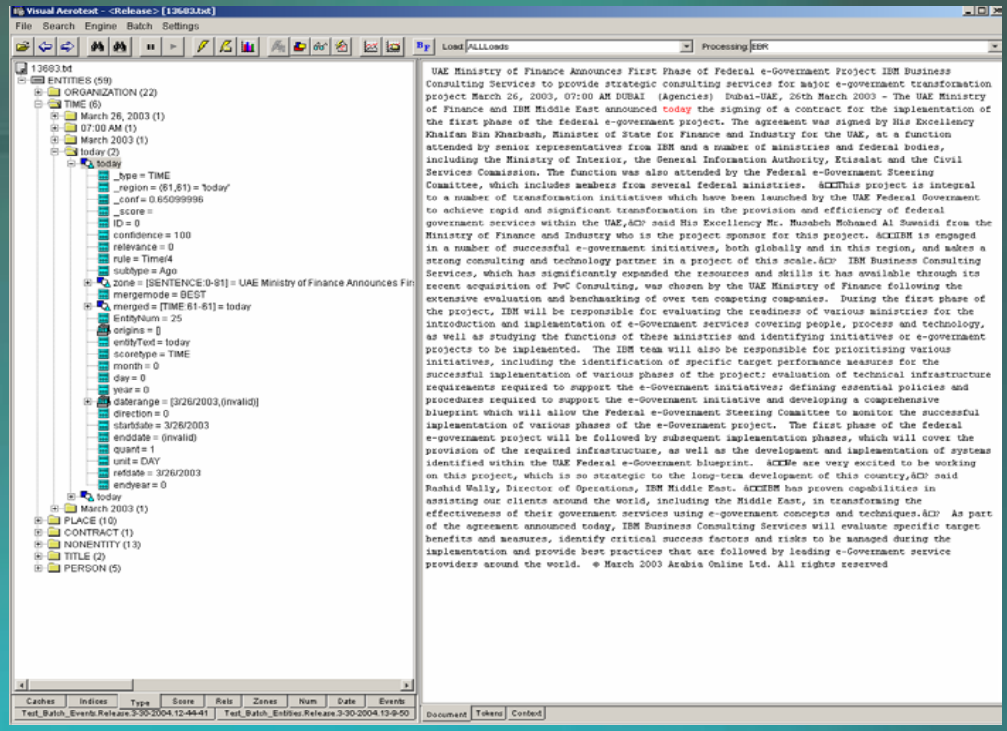
- Language processing extracts meaning from text blocks
- Input – labeled text blocks
- Output – structured data records using terms defined in operations center ontology



# Linguistic Analysis Capability

- Lockheed Martin's AeroText
  - State-of-the-art text extraction and linguistic processing tool
  - Reduces large amount of free text data to structured data record

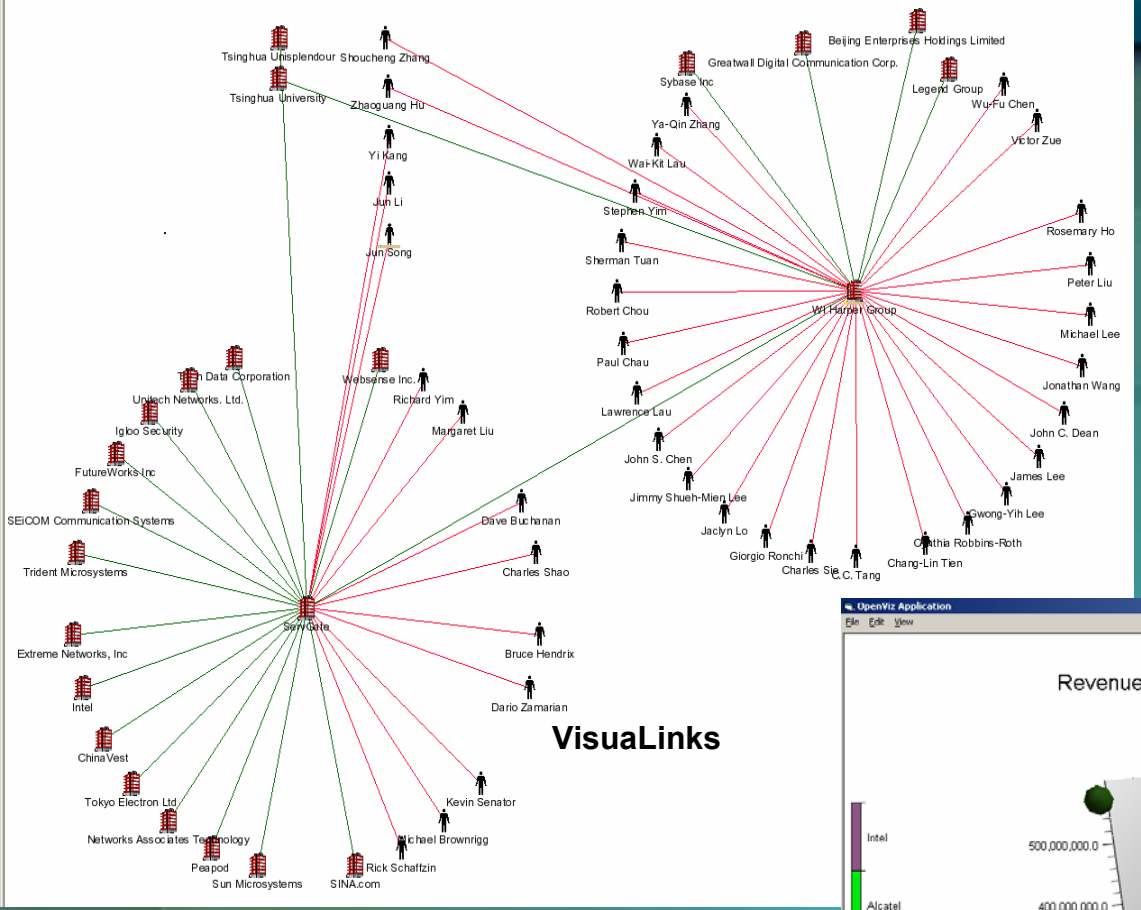


# End User Analysis and Visualization

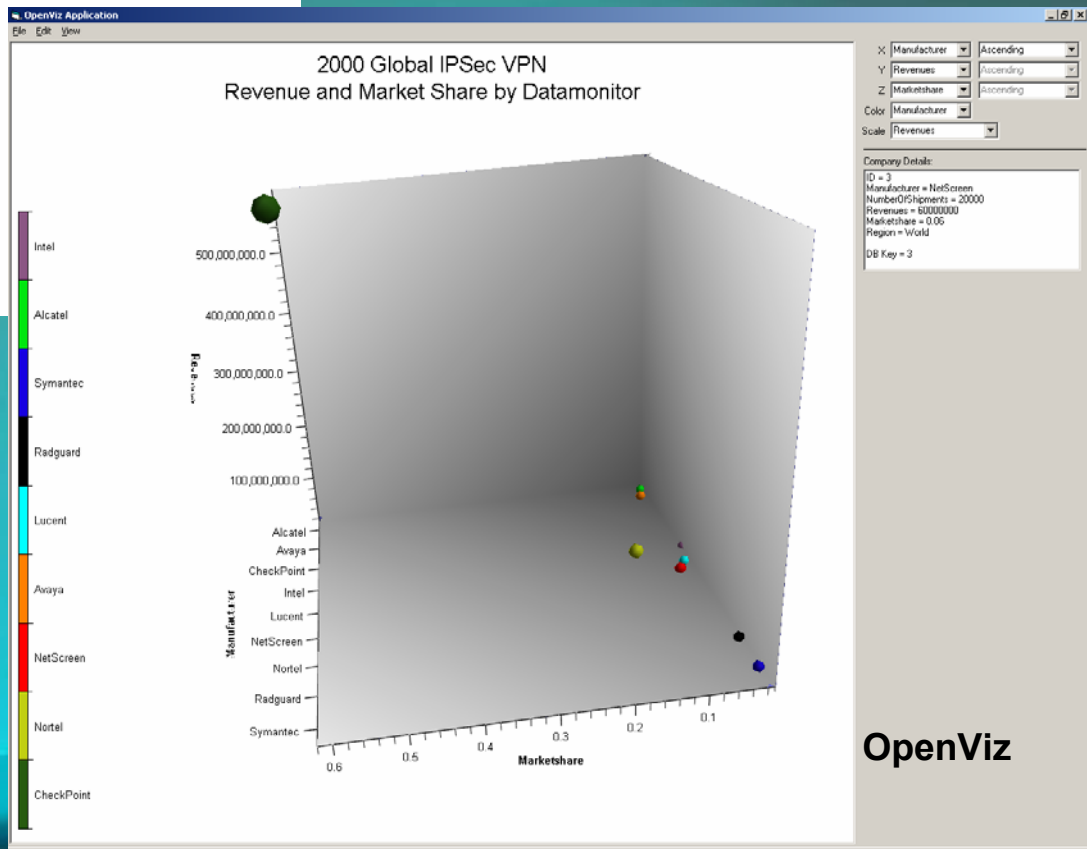
- Analysis tools to discover patterns, anomalies and relationships to connect the dots
- Input – Structured data record
- Output –Payoff knowledge

# End User Analysis

Major Tools : VisualLinks, and OpenViz




VisualLinks




OpenViz

# Lessons Learned & The Way Ahead

- Emergency responders have a great need for coordinated, interoperable systems and resources
- Team-based thinking and decisionmaking

- Team of analysts and IT experts
- Information density and visualization techniques

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