



Homeland Security

Science and Technology

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

RKB/SAVER Telephone: 877-336-2752

E-mail: saver@dhs.gov

Web site: <https://www.rkb.us/saver>

This SAVER TechNote was prepared by the Space and Naval Warfare Systems Center Atlantic for the SAVER Program.



Reference herein to any specific commercial products, processes, or services by trade name, trademark, manufacturer, or otherwise does not constitute or imply its endorsement, recommendation, or favoring by the United States Government. Neither the United States Government nor any of its employees make any warranty, expressed or implied, including but not limited to the warranties of merchantability and fitness for a particular purpose for any specific commercial product, process, or service referenced herein.

TechNote

Data Fusion

Data fusion is a collection of processes, systems, and standards to facilitate the collection, combination, and analysis of information from multiple sources in order to gain a more complete understanding of the data used within emergency responder agencies. After 9/11, the importance of sharing data between law enforcement and intelligence agencies resulted in more standardized data fusion practices throughout the law enforcement and intelligence communities. In addition, data fusion centers have been established across the nation to collect and disseminate information from disparate sources.

System and Technology Overview

As shown in Figure 1, the main goal of data fusion is to allow agencies to collect data from many sources (e.g., internal and external, local and national, public and private), analyze that data, and create actionable information based on the results of the analysis. Systems that facilitate this data fusion may consist of both hardware and software components. An entire data fusion system can be governed by established protocols, procedures, and standards.

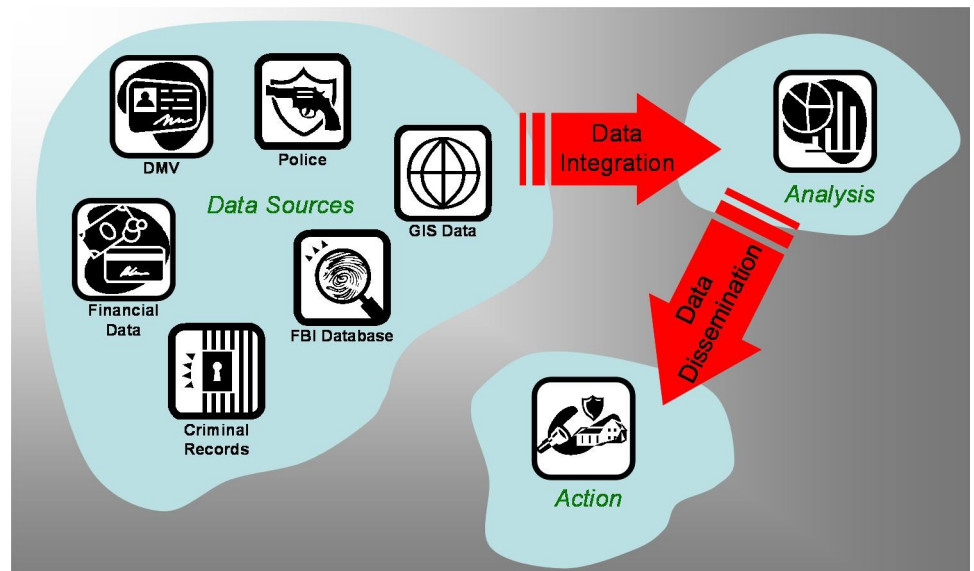


Figure 1. Example Data Fusion Process

Data Fusion Examples

The sources from which a data fusion system collects data depend largely on the mission objective(s), the agency's operational needs, and the corresponding workflow. One data fusion system may combine information on warrants, arrest records, and Department of Motor

Vehicles data to provide patrol officers with important information during traffic stops. Another may combine data from electronic records management systems (RMSs) from neighboring agencies to provide a comprehensive analysis on the trends in the region. This RMS data may include information on incidents, investigations, arrests, mug shots, traffic citation records, stolen property, and pawn shop transactions. It may also contain information on complainants, witnesses, and suspects.

Another common example of data fusion used by law enforcement agencies is crime mapping. In crime mapping, information from various agencies' computer aided dispatch systems, RMSs, case management systems, and crime statistics systems can be combined with a geographic information system. This provides a geographic representation of the data that can be analyzed for trends and patterns to help an agency allocate resources and efficiently prepare for events.

Data Fusion Software Tools

While data fusion processes could be entirely manual, data fusion software tools can reduce the time and effort required to extract actionable information from available data. There are many data fusion software tools available including government owned, open source, and commercial-off-the-shelf systems.

Data fusion software tools vary in cost, functionality, and complexity. Some of the common features in these tools are link analysis, entity resolution, mapping, data mining, and visualization.

Data Fusion Centers

The U.S. Department of Homeland Security Office of Intelligence and Analysis is a Federal agency responsible for overseeing the sharing of information between agencies through established data fusion centers. Figure 2 shows established data fusion centers across the U.S. These centers serve two purposes. First, they allow seemingly unrelated information to be integrated and analyzed to find patterns of possible terrorist activities at the national level and disseminate the potential threat information to the appropriate agencies. Second, they provide agencies access to information gathered by other agencies, either local or national, that may be pertinent to an ongoing investigation.



Figure 2. Data Fusion Centers

Source: Government Accountability Office Report GAO-11-223

Data Standards

With the move towards service oriented architectures (SOAs), one of the key components in facilitating the efficient and accurate exchange of information between agencies is the use of standardized data formats and procedures for reporting of data.

The U.S. Department of Justice and DHS jointly established the National Information Exchange Model (NIEM) of information sharing standards to meet this need. NIEM is a framework of data standards and processes that facilitate information sharing between data fusion systems. Agencies should consider data and software technology toolsets that meet NIEM standards of compliance.

A further consideration, specifically related to RMS applications that send statistical and crime reporting data to their state reporting agency, is the potential need for compliance with the Federal Bureau of Investigation's Criminal Justice Information Services Uniform Crime Reporting and/or National Incident Based Reporting System standards.

References

[National Information Exchange Model](#)

[Fusion Centers and Intelligence Sharing](#)

[Baseline Capabilities for State and Major Urban Area Fusion Centers Global Justice Information Sharing Initiative, Department of Justice, September 2008](#)

[Information Sharing, GAO Report to the Chairman, Committee on Homeland Security, House of Representatives, December 2010, GAO-11-223](#)