



**Homeland  
Security**

Science and Technology

# Summary

**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 unbiased operational tests 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 mission includes:

- Conducting impartial, practitioner relevant, and operationally oriented assessments and validations of emergency responder equipment;
- Providing information that enables decision makers and responders to better select, procure, use, and maintain emergency responder equipment.

Information provided by the SAVER Program will be shared nationally with the responder community, providing a life-saving and cost-saving asset to DHS, as well as to federal, state, and local responders.

The SAVER Program is established and 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?"

To contact the SAVER Program Support Office  
Telephone: 877-336-2752

E-mail: [saver@dhs.gov](mailto:saver@dhs.gov)

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

## Data Mining and Analysis Tools Assessment Report

*Emergency responses to events such as natural disasters, terrorist attacks, and criminal activities include three phases: (1) planning, (2) prevention, and (3) recovery. Each of these three phases requires access to the appropriate information presented in a usable format. With the assistance of data mining and analysis tools, emergency responders can extract actionable data from the large quantities of potentially useful public, private and government information and present the information in a usable format.*

### Background

The Space and Naval Warfare System Center (SPAWARSYSCEN), Charleston has conducted a study of data mining and analysis tools that support emergency responder and homeland security organizations. As part of the study, SPAWARSYSCEN has published the *Data Mining and Analysis Tools Assessment Report*. This report details the methodology, assessment criteria, and results of the assessment.

Two data mining and analysis tools were assessed:

- SPSS, Inc.'s Clementine<sup>®</sup>
- SAS Institute, Inc.'s Base SAS<sup>®</sup> with Miner.

Practitioners working in the emergency responder community evaluated the capability and usability of the vendor tools.

This assessment report is part of a series of reports on data mining and analysis tools available through the System Assessment and Validation for Emergency Responders (SAVER) Program Web site.

Other reports include:

- *Data Mining and Analysis Tools -- Operational Needs and Software Requirements Analysis*
- *Data Mining and Analysis Tools -- Product Catalog*
- *Data Mining and Analysis Tools -- Technology Review and Product Selection Guide*
- *Data Mining and Analysis Tools -- Comparative Assessment Scenarios.*

## **Assessment**

### *Methodology*

The data mining and analysis tools assessment consisted of administering a practitioner questionnaire, developing an assessment scenario, developing an assessment plan and test procedures, conducting the assessment, and analyzing the results. The Interagency Center for Applied Homeland Security Technology (ICASHT) hosted the hardware setup at the Department of Homeland Security Technical Evaluation Center (DHS/TEC).

### *Execution*

The assessment team identified emergency responders with specialization in data mining and data analysis. Three practitioners from different jurisdictions and different states with over 20 years combined experience in data mining and analysis tools participated in the assessment as evaluators. Their backgrounds included state and federal law enforcement and federal counterterrorism. Each evaluator volunteered their time to complete the training and assessment.

### *Criteria*

The data mining and analysis tools assessment Utilized two of the SAVER Program assessment categories—usability and capability, to evaluate each data mining and analysis tool. In addition, cost information was gathered during the assessment. Since deployability depends upon the agency's hardware setup, and an agency's information technology department determines maintainability, these categories were not assessed.

## **Assessment Results**

Two data mining and analysis tools, SPSS, Inc.'s Clementine and SAS Institute, Inc.'s Base SAS with Miner, were assessed over a 15-day period in August and September 2006.

The assessment results were divided into the areas of data preparation, data mining and analysis, and data visualization for analysis. Capability and usability was assessed for each of these categories, and the results are depicted in charts contained within this report.

Of the two tools assessed, the following was found:

- SAS with Miner scored higher for data preparation usability.
- SAS with Miner scored slightly higher for data mining and analysis capability, but Clementine was more usable.
- Clementine scored higher for data visualization, usability, and capability.

Figures 1 and 2 show the overall usability and capability for data mining and analysis. Results of data preparation and data visualization for analysis are contained in the report.

## **Conclusion**

Data mining tools need to be usable, capable, and affordable for emergency responders. This report documents the results of a repeatable data mining and analysis tools assessment for two data mining and analysis tools.

The results validated that SPSS, Inc.'s Clementine and SAS Institute, Inc.'s Base SAS with Miner can operate in a simulated emergency response environment. Each tool had the following strengths:

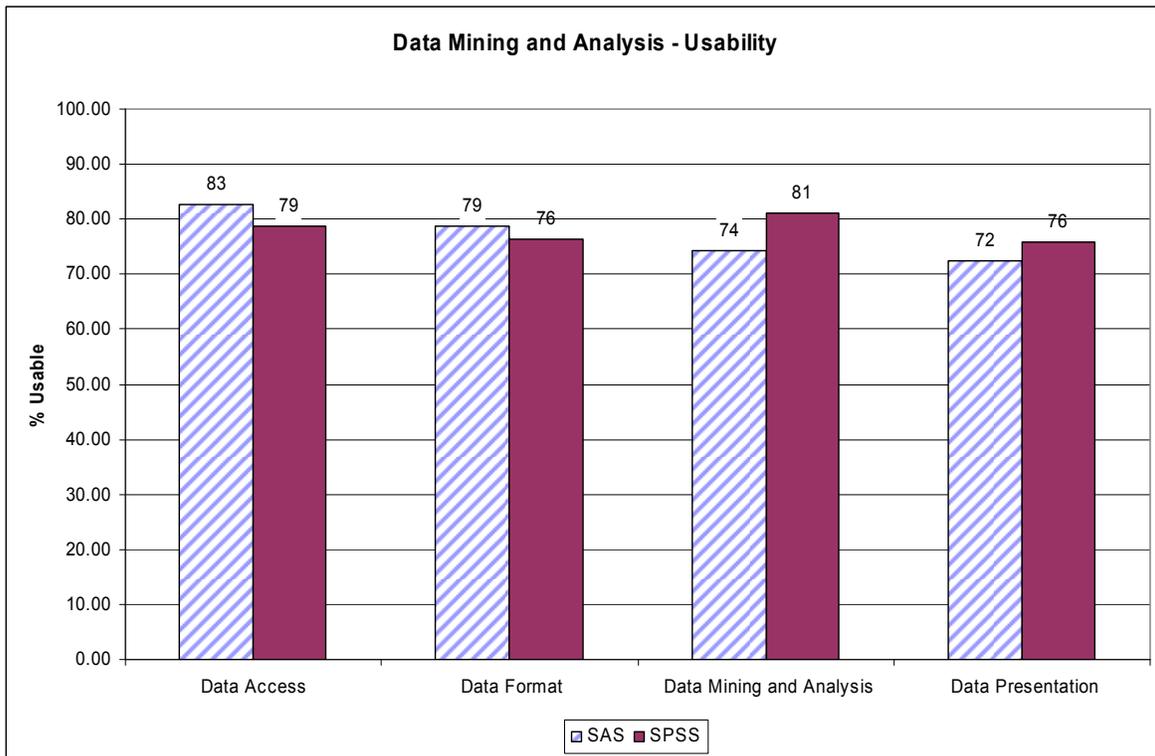
- SAS Institute, Inc.'s Base SAS with Miner's usability during data preparation

- SPSS, Inc’s Clementine’s usability for data mining and analysis and data visualization.

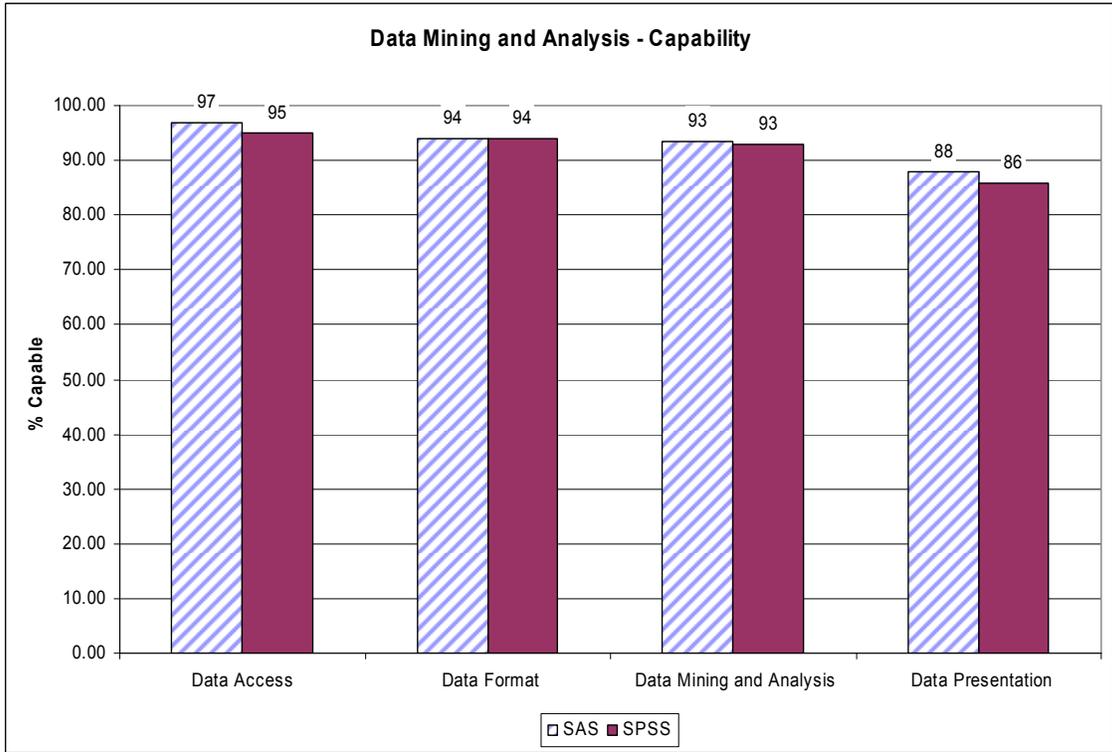
As for any software purchase, the purchasing organization should work closely with selected vendors to evaluate the software in their environment using their data and data analysts. Each organization’s operational needs will vary, and the software tool(s) that meet those needs will vary from organization to organization. The processes used during this assessment can be applied to a data mining and

analysis tools assessment conducted by an emergency response agency.

The full *Data Mining and Analysis Tools Assessment Report* and associated reports in the series can be found at <https://www.rkb.us/saver> as well as information on other equipment currently being assessed by the SAVER Program.



**Figure 1. Results for Data Mining and Analysis Usability**



**Figure 2. Results for Data Mining and Analysis Capability**