Fighting Crime and Terrorism through Data Integration

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Using the Global Data Sharing Model and XML Technology to Connect Local, State, Federal, and International Public Safety Information Systems

The constellation of clues and evidence related to criminal activity is often spread across disconnected databases and paper files in thousands of local, state, and federal agencies. In many cases criminals who have been stopped by the police are freed when local law enforcement data searches are unable to access information that is stored outside their own systems. Whether a person is arrested or is released for a crime that occurred in another jurisdiction is frequently based on the ability of the police to confirm the subject's identity that links the person to an arrest warrant. Warrants are stored in various databases at the local, state, and federal level. In addition, terrorist watch lists and investigative alerts are also computerized and stored in still yet different databases. Most of these databases are not integrated and therefore the information is not shared.

If this disparate data was fully integrated and subjected to state-of-the-art analysis tools creating a seamless data grid that could be queried in real time, law enforcement agencies would be much more effective in both preventing crime and solving open cases. In this article, a number of current initiatives focusing on the integration of criminal justice data are examined.

National Criminal Databases

The must used national database is the National Crime Information Center (NCIC). NCIC archives and provides access to data concerning fugitive, missing, and wanted persons, criminal histories, and stolen property. Criminal information is sometimes shared by entering the data into separate databases such as during the investigation of violent crimes using the Violent Criminal Apprehension Program (VICAP). VICAP is a nationwide data information center designed to collect, collate, and analyze crimes of violence, with a focus on murder. The FBI provides the VICAP database software to state and local law enforcement agencies, free of charge, and the program has been embraced by many agencies.

Legal restrictions on the sharing of intelligence data have slowed the progress of several initiatives. Federal regulations and state laws in some cases prohibit agencies from participating in a data warehouse that commingles criminal and intelligence data or sharing local records with the federal government.

There is no national database for sharing information among criminal justice agencies concerning criminal activity and information contained in law enforcement incident reports where most of the intelligence and investigative information is found. Several barriers have been prevented the creation of such a database.

- There has been resistance to sharing information between agencies. In many communities the fact that crimes are being committed is concealed from the public as much as possible. No community wants to be perceived as being an unsafe place to live or work. If information about crime is shared between agencies it is feared that the public would know the information.

- Computerized records management software designed for law enforcement is a relatively new phenomenon. This technology has only become widely used in the last 20 years. Most law enforcement agencies have records management software, but there are many that continue to use paper reports.

- Records management systems are typically developed in-house or purchased from a vendor. Some public safety vendors have written software programs that allow multiple police agencies to link their databases as long as each agency is using the same vendor's system. Efforts are now under way to find a uniform way to connect legacy systems that use vendors' proprietary systems.

Several large-scale efforts are developing criminal justice integration standards. The successful integration of data is highly dependent upon the development and adoption of accepted standards.

Fig. 1. Justice IT Standards Collaboration
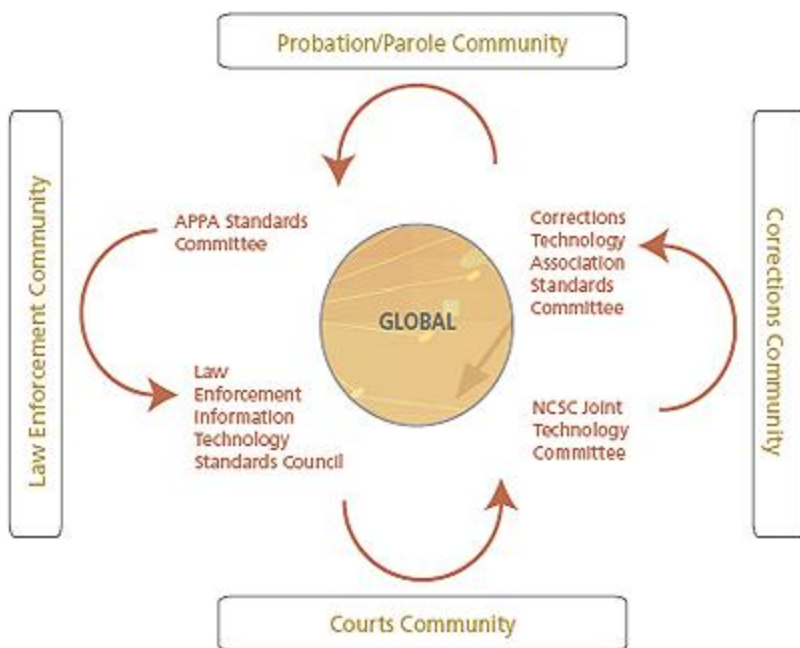
The Global Initiative

The International Association of Chiefs of Police recognizes that crime crosses state and national boundaries and has therefore urged the Bush administration and U.S. Congress to support efforts such as the Global Justice Information Sharing Initiative for improving the integration and compatibility of local, state, federal, and international criminal justice information systems.

Global is a consortium of 32 local, state, federal, and international justice organizations that are working on sharing information using a common XML standard. Member organizations participate in Global out of shared responsibility and a shared belief that, together, they can bring about positive change in inter-organizational communication and data sharing that will span the spectrum of law enforcement, judicial, correctional, and related bodies. Global released the first operational version of their XML Data Model (GJXDM) in February 2004.

As part of this effort the GAC (Global Advisory Council) was established to advise the U.S. attorney general. GAC aids its member organizations and the people they serve through a series of important initiatives such as the facilitation of the Global working groups; the development of technology standards, such as the Global Justice XML Data Model; the creation of white papers on data sharing issues, such as the National Criminal Intelligence Sharing Plan;[1] and the dissemination of information via the Global Web site .[2]

Global aims to develop and implement a standards-based electronic information exchange capability, providing the justice community with timely, accurate, complete, and accessible information in a secure and trusted environment. The value of a Global Justice Information Sharing Initiative capability is that it benefits all operational justice officials.

The efforts of the Global Justice Information Sharing Initiative (Global) Advisory Committee (GAC) have directly affected the work of more than 1.2 million justice professionals. The organization's mission positions Global to impact citizens of the United States, Canada, and other nations. Global's mission-the efficient sharing of data among justice entities-is at the very heart of modern public safety and law enforcement.

Search
Search, the National Consortium for Justice Information and Statistics, is a nonprofit membership organization created by and for the states. Search is dedicated to improving the criminal justice system and the quality of justice through better information management, the effective application of information and identification technology, and responsible law and policy.

Since 1969 Search's primary objective has been to identify and help solve the information management problems of state and local justice agencies confronted with the need to exchange information with other local agencies, state agencies, agencies in other states, or with the federal government.

Search is governed by a membership group composed of one gubernatorial appointee from each of the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, as well as eight at-large appointees selected by Search's chairperson. Members are primarily state-level justice officials responsible for operational decisions and policy making concerning the management of criminal justice information, particularly criminal history information.

A staff of professionals works from Search headquarters in Sacramento, California, to implement solutions identified by the membership group. Through its staff and with the direction of the membership, Search provides justice agencies with diverse products, services, and resources through three program areas: systems and technology, law and policy, and research and statistics.

Funding for Search activities is provided by annual fees from member states for the operation of the consortium and board of directors' grants from various U.S. justice agencies, state grants and federal, state, and local contracts.

The Justice Information Exchange Model (JIEM) is a product of Search. Its components include a conceptual framework, a research and planning methodology, and the JIEM Modeling Tool, a Web-based software application that enables users to document and analyze justice information exchanges. JIEM is the model that is preferred by NASCIO (National Association of States Chief Information Officers) for interstate integration of justice systems by the states.

JIEM incorporates the use of the Global Justice XML Data Model (GJXDM). GJXDM has been created to facilitate a common set of XML definitions to be used by all levels of justice professionals to share information.

Law Enforcement Information Technology Standards Council
The Law Enforcement Information Technology Standards Council (LEITSC) is a joint effort of the International Association of Chiefs of Police, the National Sheriffs' Association, the National Organization of Black Law Enforcement Executives, and the Police Executive Research Forum to develop information standards specific to the law enforcement community. LEITSC uses integration practitioners, industry representatives, and justice standards representatives to review and evaluate existing information standards, specifically designed to meet functional and technical XML standards.

Working cooperatively with the National Center for State Courts (NCSC), the Corrections Technology Association (CTA), and the American Probation and Parole Association's Standards Committee (APPA) and others, LEITSC is researching and compiling data needed to develop and prepare recommended standards.

Other Integration Efforts
There are a number of other national integration efforts, including the Office of Law Enforcement Standards' (OLES) Public Safety Communications Standards program, which is developing standards for voice, data, image, and video transfer. OLES works closely with Global. Project coordination is by the Office of Justice Planning (OJP) and the Bureau of Justice Assistance (BJA).

The Organization for the Advancement of Structured Information Standards (Oasis) announced in January 2004 that the Legal XML Lawful Intercept (LI-XML) Committee was formed to help meet agencies' information sharing needs.

XML is being used by NLETS (National Law Enforcement Telecommunication System). The American Association of Motor Vehicle Administrators (AAMVA) supports this initiative. AAMVA is a voluntary body of all state and provincial officials in the United States and Canada that administer and enforce motor vehicle law.

The Industry Working Group (IWG) and the Integrated Justice Information Systems (IJIS) Institute represent over 200 private companies that specialize in criminal justice technology. Its members participate in the standards development effort at the national level through its participation on subcommittees of the Global Justice Information Sharing Initiative and by directly assisting jurisdictions in CJIS integration.

Intelligence Data Sharing
Sharing of intelligence and information about individuals or groups that are involved in criminal activities is very limited. In fact, a survey conducted by the Major Cities Chiefs Association revealed the following problems:[3]

- Lack of communication and information sharing-specifically, lack of a centralized analysis and dissemination function, either at the state or federal level, lack of intelligence from federal agencies, and state statutory requirements that present hurdles to sharing information

- Technology issues-specifically, lack of equipment to facilitate a national intelligence data system, lack of interconnectibility of law enforcement and other databases (such as immigration services), limited fiscal resources, lack of technological infrastructure throughout the state, and lack of uniformity between computer systems

- Lack of intelligence standards and policies-specifically, lack of common standards for collection, retention, and dissemination of intelligence data; a need for increased local training on legal standards for collection, storage, and purging of data; access to classified data; and lack of standards for determining when to disseminate intelligence to federal agencies

- Lack of intelligence analysis-specifically, lack of compatible analytical software and lack of analytical support, personnel, equipment, and training

- Poor working relationships-specifically, unwillingness of law enforcement agencies to provide information due to parochial interests and a culture in the federal system that does not foster sharing of information or trust between agencies
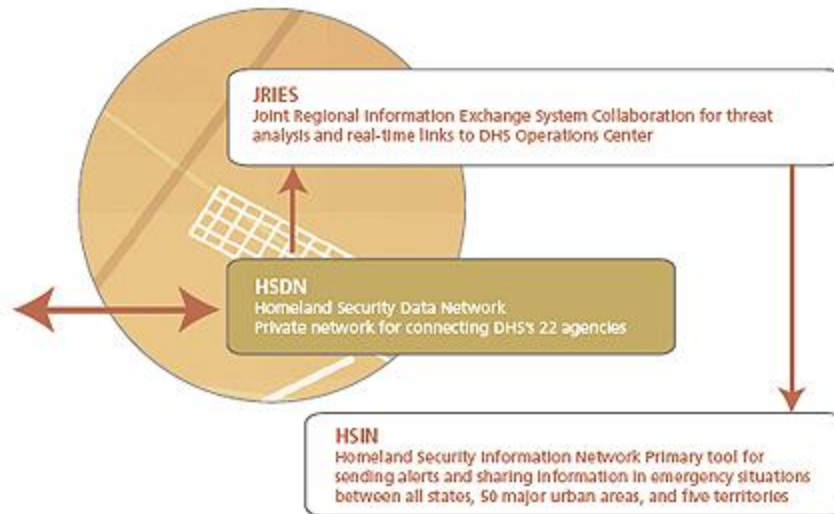
Federal Initiatives
Federal authorities are also taking steps to address criminal justice integration. Following is a summary of initiatives in progress.

U.S. Department of Justice: In February 2004 the U.S. attorney general created the Justice Intelligence Coordinating Council to coordinate intelligence sharing among Justice Department components. The federal government designated the six Regional Information Sharing Centers Systems (RISS) to share information with state and local law enforcement. RISS was linked to LEO (Law Enforcement Online), the FBI's information sharing system, to form RISS/LEO. The system is being used to provide security information to be distributed quickly to all RISS and LEO users through a new Internet-based alert system.

A new project called ATIX-RISS, or Automated Trusted Information Exchange, recently began testing in several states running across the RISS/LEO system. This plan grew out of the recommendations of the Global Justice Information Sharing Advisory Committee (GAC).

Fig. 2. U.S. Department of Homeland Security Net

JRIES
Joint Regional Information Exchange System Collaboration for threat analysis and real-time links to DHS Operations Center

HSDN
Homeland Security Data Network
Private network for connecting DHS's 22 agencies

HSIN
Homeland Security Information Network Primary tool for sending alerts and sharing information in emergency situations between all states, 50 major urban areas, and five territories

U.S. Department of Homeland Security: Since the Department of Homeland Security's inception in early 2003, it has been developing and implementing a national security communications net. The DHS communication net is designed to provide threat analysis and intelligence information between the component agencies of the DHS and to state and local agencies.

The net has three components: JRIES (Joint Regional Information Exchange System), HSDN (Homeland Security Data Network), and HSIN (Homeland Security Information Network).

JRIES is a secure network and a suite of applications currently operating at the sensitive but unclassified (SBU) level. Participants currently include approximately 100 organizations, including federal agencies, states, municipalities, and other local government entities, with a significant law enforcement user base. All participating entities have a certified counterterrorism mission. Approximately 1,000 users currently have access to the system. JRIES's collaboration tools are used for threat analysis and provide real-time links to the DHS Operation Center.

HSDN is a private secure network for the sharing of information between the 22 agencies of the Department of Homeland Security. HSIN is the primary network for sending alerts and sharing information in emergency situation between DHS and all states, 50 major urban areas, and five territories.

In October 2004 the Homeland Security Department launched the Office of Interoperability and Compatibility, along with the release of tools designed to help state and local public safety practitioners improve communications interoperability.

The Office of Interoperability and Compatibility (OIC), part of the Science and Technology directorate, will oversee the wide range of public safety interoperability programs and efforts currently spread across Homeland Security. These programs address critical interoperability issues relating to public safety and emergency response, including communications, equipment, training, and other areas as needs are identified.

State Initiatives
In 1997 the Commonwealth of Pennsylvania created a secure online environment for the sharing of criminal justice information among participating agencies. As of December 14, 2004, JNET, as it is known, is connecting the following participants:

- More than 18,500 total users
- 52 counties
- 39 state agencies
- 32 federal agencies
- More than 400 municipal police departments
- More than 200 state police divisions
- More than 500 district justice offices

The JNET Office is involved in two national information-sharing efforts with the National Governors Association (NGA). The first effort is being sponsored by Utah and involves developing a national framework for homeland security information sharing. This model is being endorsed and sponsored by the National Office of Homeland Security. The JNET model and governance structure will be used as a framework for this initiative.

The second effort, known as the Middle Atlantic Justice Information Sharing Initiative, was initiated, hosted, and sponsored by the JNET Office. Representatives from seven surrounding states, the National Office of Homeland Security, Office of Justice Programs, National Governors Association, Search and the National Criminal Justice Association are collaborating on an effort to share information amongst participating states as a pilot for a national integrated justice system. The JNET model and governance structure will be used as a framework for this initiative.

JNET is considered the most advanced state initiative and a national model for information sharing.[4]

Criminal Intelligence Coordinating Council
The Criminal Intelligence Coordinating Council (CICC) represents the interests of local law enforcement in promoting, establishing and ensuring effective intelligence sharing among local, state, tribal and federal agencies. Several standards have been issued by the CICC and its research partner, the Global Intelligence Working Group, including the Chief Executive Curriculum training.

The Chief Executive Curriculum is an executive briefing course that covers intelligence-led policing, basic intelligence, legal and privacy issues, and available resources. In addition, the CICC, working with the International Association of Law Enforcement Intelligence Analysts, developed 25 law enforcement analysis standards. Seven of the standards were for analysts and 18 were for analytic products.

The National Criminal Intelligence Sharing Plan also recommends that law enforcement executives conduct periodic audits of criminal intelligence operations and files to ensure that guidelines and regulations are followed. To assist in the audit, the Law Enforcement Intelligence Unit has made available an audit checklist. The periodic audits demonstrate to a community that local law enforcement is committed to protecting individual privacy and constitutional rights while improving the efficiency of the criminal intelligence operation.

The CICC mission is to be responsive to the needs of local law enforcement while working toward the goal of an integrated, unified national intelligence effort. The key ingredient is the involvement of local law enforcement to provide the link between intelligence and information among all levels of government.

Regional Initiatives

Perhaps the most successful regional effort for sharing criminal justice information is the San Diego region's Automated Regional Justice System (ARJIS). ARJIS is a complex criminal justice enterprise network used by 50 local, state, and federal agencies in the San Diego region. ARJIS is chartered with supporting a regional Web-based enterprise network that uses technical and operational standards to build interfaces to all criminal justice systems in the region. The ARJISNet secure intranet contains data on the region's crime cases, arrests, citations, field interviews, traffic accidents, fraudulent documents, gangs, and stolen property.

ARJISNet integrates more than 2,500 workstations and printers throughout the 4,265 square miles of San Diego County. There are over 10,000 registered and authorized users generating over 35,000 transactions daily.

ARJIS is also used for tactical analysis, investigations, statistical information, and crime analysis. Officers and investigators can additionally request electronic notification when information is obtained by another agency or officer concerning an individual, a location, or a vehicle. The critical success factor for ARJIS is the single point of entry to query all regional justice data.

ARJIS is currently collaborating with the National Institute of Justice (NIJ) to build new Web-based technologies to continue the support of the criminal justice community.[5]

Barriers to Successful Integration of Criminal Justice Data

Some initiatives for information sharing have failed due to legal and political concerns over privacy rights. One example is the Multistate Anti-Terrorism Information Exchange System (Matrix). Shortly after the September 11, 2001, terrorist attacks, the Florida Department of Law Enforcement (FDLE) decided to improve the way it shared information. Working with an industry vendor they developed the Matrix system to serve as a way for law enforcement officials in Florida, Georgia, New York, Oregon, and Pennsylvania to share data, but a handful of other states also were attracted to the project. By mid-2003 it had grown to encompass 13 states, accounting for about 50 percent of the U.S. population.

Using the Factual Analysis Criminal Threat Solution, the Web-based technology core of Matrix, users can submit a query on anything relating to a possible suspect or a criminal situation and get back related information within seconds. From a technological point of view, Matrix was a success.

But in late 2003 the American Civil Liberties Union (ACLU) started campaigning against Matrix, claiming that law enforcement agencies could mine an array of personal information contained in the databases. Stories began appearing in newspapers nationwide comparing Matrix to the Total Information Awareness program, which was conceived by officials at the Defense

Advanced Research Projects Agency as a way of tracking potential terrorists in the general population. Officials had to shelve TIA after a public outcry over privacy implications.

Several participants dropped out after the ACLU's campaign gathered momentum. Utah officials backed out because of privacy concerns after the governor and other state political leaders complained that they learned of the state's involvement only through the media. Other states opted out of the program due to cost and other considerations such as control over their data.

Involvement in Matrix is now down to five states: Connecticut, Florida, Michigan, Ohio, and Pennsylvania. Law enforcement officials who use Matrix are making adjustments. For example, they recently decided to move to a distributed database so that states would be able to control their own data, alleviating concerns about the security of data that is moved to a central database.

Legal restrictions on the sharing of intelligence data have slowed the progress of several initiatives. The Criminal Intelligence Systems Operating Policies of 28 C.F.R. 23 and state laws in some cases prohibit agencies from participating in a data warehouse that commingles criminal and intelligence data or sharing local records with the federal government.

The Future
In today's interconnected world, public safety officials at all levels of government are attempting to establish standards and protocols for sharing information about criminal activity. The importance of the ability of government to collect information, analyze that information accurately, and share it appropriately has been brought to the forefront by recent terrorist activities.

The failure of emergency responders to communicate with each other during incidents has been identified and attempts to improve the communications systems are being pursued. The establishment of systems for sharing accurate and timely information is being put into place so that effective responses can be activated and resources deployed effectively.

Millions of dollars are being spent to enhance intelligence sharing and communications between our government's homeland security and public safety agencies. The use of Extensible Markup Language (XML) has been determined to be the technology of choice for many of the ongoing CJIS initiative