Global Justice XML Data Model

The advent of Extensible Markup Language (XML) technology has exponentially impacted the way data and its meaning are expressed and understood worldwide.

Interoperability among the justice and public safety communities has been foundationally accelerated by XML through the development and integration of the Global Justice XML Data Model (Global JXDM), a benchmark in justice XML standards that expresses the baseline data needs of justice and public safety communities and their related partners.

Developed by the Global Justice Information Sharing Initiative (Global), Office of Justice Programs (OJP), U.S. Department of Justice (DOJ), the Global JXDM represents a significant change in the way practitioners develop their information sharing systems. Through the use of a common vocabulary that is understood system to system, Global JXDM enables access from multiple sources and reuse in multiple applications, allowing justice and public safety communities to effectively exchange information at all levels.

Prior to the development of the Global JXDM, justice agencies generally operated within their own computer networks and database systems, resulting in a fragmented justice environment where requests for critical information took days or weeks to get to the appropriate agencies. Increasingly, however, local, state, tribal, and federal projects are adopting the Global JXDM and realizing significant benefits.

Forward-thinking state governments like Arizona, Pennsylvania, and Minnesota are adopting the Global JXDM into their information infrastructures and leading the way into a new future for justice information sharing. Today, more than 50 law enforcement and justice-related projects have been implemented utilizing the Global JXDM, further demonstrating its flexibility and stability. For a listing of agencies who are planning or have implemented projects using the Global JXDM, refer to the Organizations Utilizing the Global JXDM listing.

While there are potential advantages to an organization for implementing the Global JXDM, it is unreasonable to expect that all organizations in the justice and public safety communities are prepared to do so, either technologically, programmatically, or financially, at this time. However, short of full implementation in production systems, there are important uses for this body of work that are consistent with the way communities identify and share information.

Some projects may adopt all of the elements of the Global JXDM and extend it for their particular needs; others may have a data model or dictionary already in place and decide to “map” to the Global JXDM. Still others may decide they only need a portion of the Global JXDM data and will create their own XML schema data based on subsets derived from it. In any of these cases, the common denominator or reference baseline is the Global JXDM, which will enable managers and developers to have a reliable standard.

“The movement of Arizona to the Global Justice XML standard is a giant step forward towards standardization between information systems in the state—the movement will also be a tremendous assist to vendors wishing to do business in the state.”

Gerald Hardt, Records Program Manager, Arizona Criminal Justice Commission (ACJC)

“Access to this information via JNET has provided an incredible time and cost benefit. JNET has reduced the response time from weeks to seconds.”

Chad Firestone, Executive Director, Pennsylvania Justice Network (JNET)

“If we have a single standard, the cost may be about $50K. If we have fifty different standards, one for each state, this type of interface will cost us $2.5 million ($50K X 50). So standards are a really good thing when you have limited budgets.”

Dan McCreary, Information Technology (IT) Consultant, Minnesota’s CriMNet

Over time, as familiarity with the Global JXDM increases and experience with the advancing technologies is gained, justice and public safety communities—through their information systems—will be well positioned to adapt to ever-changing business and information exchange requirements because they will have a common reference baseline for exchanging information as indicated in the Global JXDM.

For the most current Global JXDM version, updates, and related products, refer to the OJP Information Technology Web site: http://www.it.ojp.gov/gjxdm.

This document was prepared under the leadership, guidance, and funding of the Bureau of Justice Assistance (BJA), Office of Justice Programs, U.S. Department of Justice, in collaboration with the Global Justice Information Sharing Initiative. The opinions, findings, and conclusions or recommendations expressed in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

History

- Evolution of Global Justice XML
- Historical Documents

The concept of sharing criminal justice information is not a new one. For decades, there have been significant efforts to share criminal justice information. In fact, as early as 1930, when the first interstate teletype connection went into service, law enforcement sought to exchange information as a potent weapon against crime.

In the ’60s, many criminal justice organizations were managing and exchanging information using terminals routed to mainframe computers that, by the early ’70s, evolved into minicomputer systems. Advancements in the mid-’80s led to the proliferation of personal computers and PC-based networks, where data began to be stored on file servers.

This automation revolution allowed individuals in an agency’s office to share files and communicate more efficiently with one another and, in some cases, with other agencies. However, it also led to piecemeal interoperability, where individual software applications were programmed to serve a single agency or group of agencies without regard for the need to share information across different computer platforms or even across the entire criminal justice domain.

We have come a long way from mainframe data sharing through the era of PC and server-assisted data sharing. It is now time to move toward an interoperable data sharing model that will allow current networks and applications to continue to exist and serve the agencies that designed them, while also sharing the data they collect and store across the entire criminal justice domain, locally and nationwide.

Examples and Implementations

Examples

- **Global JXDM Presentation Scenario**

Implementations

- **Pennsylvania Justice Network (JNET) – Driver History Record Tool**
- **Mapping Alaska's Justice InterChanges (MAJIC)**
- **AMBER Alerts and NLETS – The International Justice and Public Safety Information Sharing Network**

Examples and Implementations demonstrate how Extensible Markup Language (XML) and the Global Justice XML Data Model (Global JXDM) can and have been used. The Global JXDM is extendable and expandable and is built to evolve with emerging technologies.

Prior to the development of the Global JXDM, justice agencies generally operated within their own computer networks and database systems, resulting in a fragmented justice environment where requests for critical information took days or weeks to get to the appropriate agencies. The Implementations illustrated here have realized significant benefits from using the Global JXDM in their justice information sharing projects.

For a listing of other justice agencies that are developing or have implemented projects utilizing the Global JXDM, refer to Organizations Utilizing the Global Justice XML Data Model (Global JXDM).

Compliance Guidelines

Global JXDM Implementation Guidelines

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and Global Justice XML Data Dictionary (Global JXDD) are the result of an effort by the justice and public safety communities to produce a set of common, well-defined data elements to be used for data transmissions.

The Global JXDM is a reference model. This means it is not a rigid standard that must be used exactly as it is in its entirety. The Global JXDM was designed as a core set of building blocks that are used as a consistent baseline for creating exchange documents and transactions within the justice community. While an XML schema rendering of the entire model exists, it is not a requirement for Global JXDM compliance that this entire schema be used for validation. Nonetheless, there are several informal conformance requirements—the Global JXDM Implementation Guidelines.

The goal of the conformance guidelines is for the sender and receiver of information to share a common, unambiguous understanding of the meaning of that information. Conformance to Global JXDM ensures that a basic core set of information (the Global JXDM components) is well understood by the community and carries the same meaning. The result is some level of interoperability that would be unachievable with the proliferation of custom schemas and dictionaries.

For specific Global JXDM conformance requirements, refer to the Global JXDM Implementation Guidelines.

Tools

Process Modeling

- Justice Information Exchange Model (JIEM)

Search, Navigate, and Build

- Global JXDM Schema Subset Generation Tool (SSGT)
- Wayfarer Search Tool

Validation Tool

- Global JXDM Validator

Class Hierarchy Tree

- Global JXDM Class Hierarchy

Error Reporting

- Bugzilla Feedback

Throughout the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) development and testing process, several tools were identified as necessary for assisting individuals and agencies in implementing the Global JXDM. These include a tool to search the model and build schema subsets, a means for validation, a mechanism for reporting errors, and more.

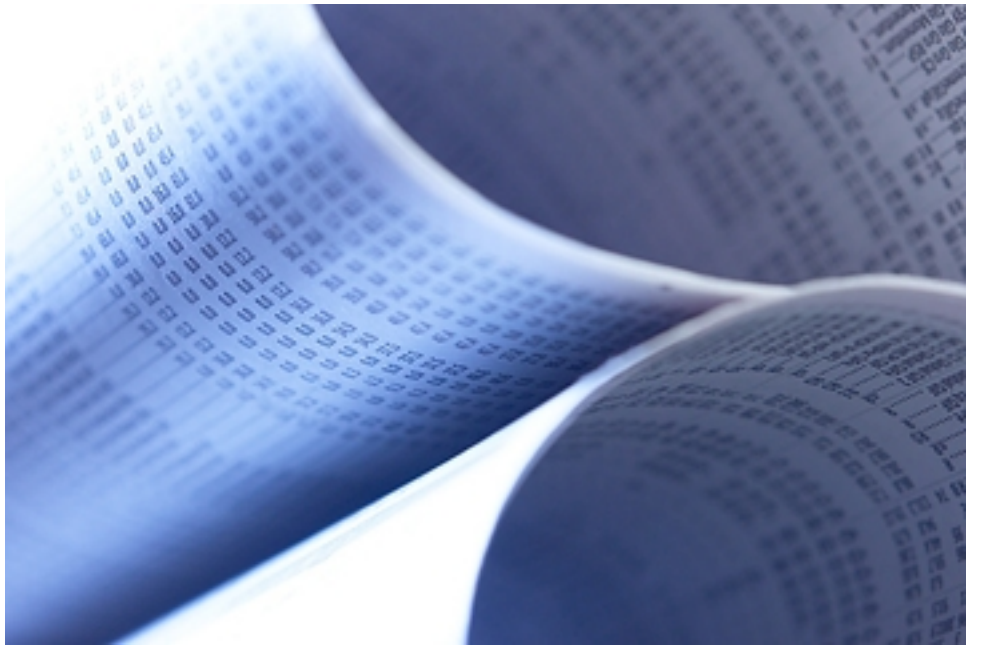
In addition to these tools, training workshops, classes, and online training materials are available. Refer to Global JXDM Training and Events for more information.

Peer assistance can be obtained through the Global JXDM Listserv discussion forum and by contacting agencies who have implemented the Global JXDM, listed in Organizations Utilizing the Global Justice XML Data Model. Further help is also accessible through Frequently Asked Questions (FAQs) or by e-mail correspondence. Refer to Contact for more information.

Technical Documentation

- Global JXDM Supporting Resources
- Additional XML Resources

Technical documentation is continuously being developed in order to assist agencies and developers in better understanding the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). In the Supporting Resources section, there are links to Global JXDM-related resources, including Component Definitions and Examples, Requirements and Guidelines, and Specifications that may contribute to an understanding of the Global JXDM. Additional XML Resources are also provided regarding XML technology.



For historical documentation and a brief history on the development of the Global JXDM, refer to History.

Training and Events

- Global JXDM Developer's Workshops
- Global JXDM Online Training Materials
- Justice Information Exchange Model (JIEM) Training and Certification

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The Office of Justice Programs (OJP), U.S. Department of Justice, and the Global Justice Information Sharing Initiative (Global) strive to assist agencies in their efforts to implement projects using the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). OJP and Global occasionally host training events, or workshops, and also provide training materials online. SEARCH, The National Consortium for Justice Information and Statistics, offers classes and certification on the Justice Information Exchange Model (JIEM), which interfaces with the Global JXDM and is a useful tool in planning and implementing justice integration projects using the Global JXDM.

Peer assistance can be obtained through the Global JXDM Listserv discussion forum and by contacting agencies who have implemented the Global JXDM, listed in Organizations Utilizing the Global Justice XML Data Model. Further help is also accessible through Frequently Asked Questions (FAQs) or by e-mail correspondence. Refer to Contact for more information.

Help

Tools

- **Process Modeling**
  - Justice Information Exchange Model (JIEM)
- **Search, Navigate, and Build**
  - Global JXDM Schema Subset Generation Tool (SSGT)
  - Wayfarer Search Tool
- **Validation Tool**
  - Global JXDM Validator
- **Class Hierarchy Tree**
  - Global JXDM Class Hierarchy
- **Error Reporting**
  - Bugzilla Feedback

Peer Assistance

- Global JXDM Listserv
- Organizations Utilizing the Global Justice XML Data Model (Global JXDM)

Frequently Asked Questions (FAQs)

Contact

Appendix

Acknowledgements

Glossary of Terms and Internet Links

Contact

General Comments

For general comments or questions, please send e-mail correspondence to: it@ojp.gov.

Global JXDM Errors

For Global JXDM error reporting, please refer to the Bugzilla Feedback site.

Site Map

- Introduction
  - What Is XML?
  - What Is Global JXDM?
    - Vision and Purpose
    - Global JXDM Versus Global JXDD
    - Advantages
    - Design Criteria and Goals
      - Design Criteria
      - Design Criteria Goals
    - Design Assumptions
    - Components and Reference Architecture
      - Components
      - Reference Architecture
      - Related Information
  - Organization and Advisory Bodies
    - Office of Justice Programs (OJP), U.S. Department of Justice
    - Global Justice Information Sharing Initiative (Global)
    - Global Advisory Committee (GAC)
    - Global Extensible Markup Language (XML) Structure Task Force (GXSTF)
    - GJXDM Training and Technical Assistance Committee (GTTAC)
    - Development Support and Guidance
    - Global Committee Structure Chart
  - News and Press Releases
    - News
    - Press Releases
  - Awards
- History
  - Evolution of Global Justice XML
  - Historical Documents
    - General Development
    - Summaries and Fact Sheets
    - Technical
- Examples and Implementations
  - Examples
  - Implementations
    - Pennsylvania Justice Network (JNET) – Driver History Record Tool
    - Mapping Alaska's Justice InterChanges (MAJIC)
    - AMBER Alerts and NLETS – The International Justice and Public Safety Information Sharing Network
- Compliance Guidelines
- Tools
  - Process Modeling
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  - Validation Tool
    - Global JXDM Validator
  - Class Hierarchy Tree
    - Global JXDM Class Hierarchy
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  - Global JXDM Supporting Resources
    - Component Definitions and Examples
    - Requirements and Guides
    - Specifications
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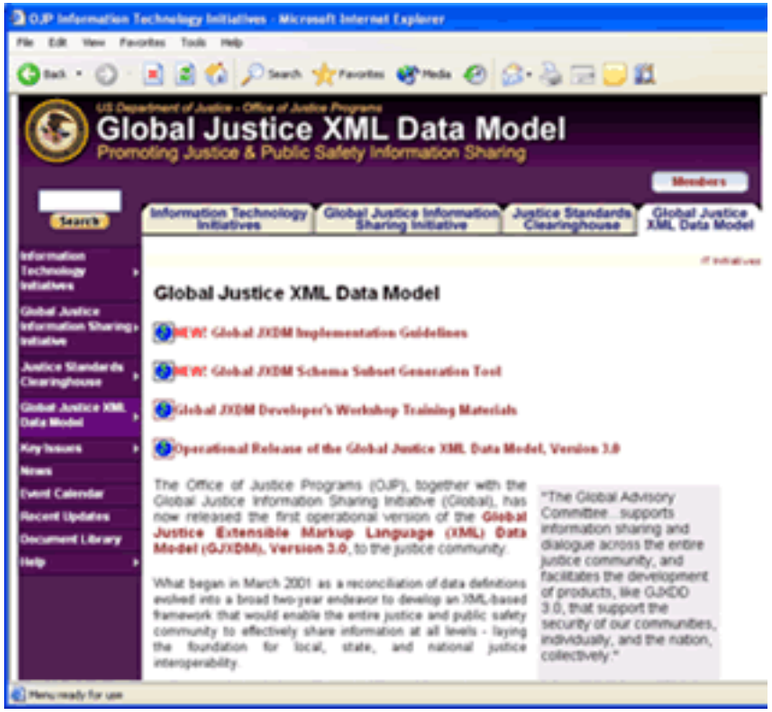
- Training and Events
  - Global JXDM Developer's Workshops
  - Global JXDM Online Training Materials
  - Justice Information Exchange Model (JIEM) Training and Certification
    - JIEM Training Classes
    - JIEM Certification
- Help
  - Frequently Asked Questions (FAQs)
  - Peer Assistance
    - Global JXDM Listserv
    - Organizations Utilizing the Global Justice XML Data Model (Global JXDM)
  - Contact
- Appendix
  - Acknowledgements
  - Glossary of Terms and Internet Links
- Contact
- Site Map

Internet Access Recommended

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) CD is intended as a comprehensive overview of the Global JXDM and serves as an extension of the abundant resources housed on the Global JXDM Web site (www.it.ojp.gov/gjxdm).



The Global JXDM CD has been developed to give the viewer a “basic” understanding of the Global JXDM by providing straightforward descriptions, along with Internet links, encompassing the Global JXDM, its history and components, types of assistance and available tools, and illustrations on how the Global JXDM is being applied in the justice field.

To ensure consistent navigation and access to the external links contained within the Global JXDM CD, **Internet access is highly recommended**.

Frequently Asked Questions (FAQs)

A user feedback-based list of Frequently Asked Questions (FAQs) is available to assist users with common questions regarding the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) project and related technology. Topics range from general “what is” questions to more technical questions about the Global JXDM, its tools, and how to provide feedback or to participate.

Peer Assistance

- Global JXDM Listserv
- Organizations Utilizing the Global Justice XML Data Model (Global JXDM)

In addition to the development tools available for the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM), those who are researching, planning, or implementing projects using the Global JXDM may also benefit from the knowledge and experiences of other agencies and developers.

If, during implementation, developers experience difficulties in applying any aspect of the Global JXDM, they can submit their questions to the Global JXDM Listserv for assistance. Peer professionals and technical experts consistently provide useful responses to requests for help.

For planning and implementation purposes, the list of contacts and project information shown in the Organizations Utilizing the Global JXDM can be helpful as another peer resource.

Error Reporting

Bugzilla Feedback

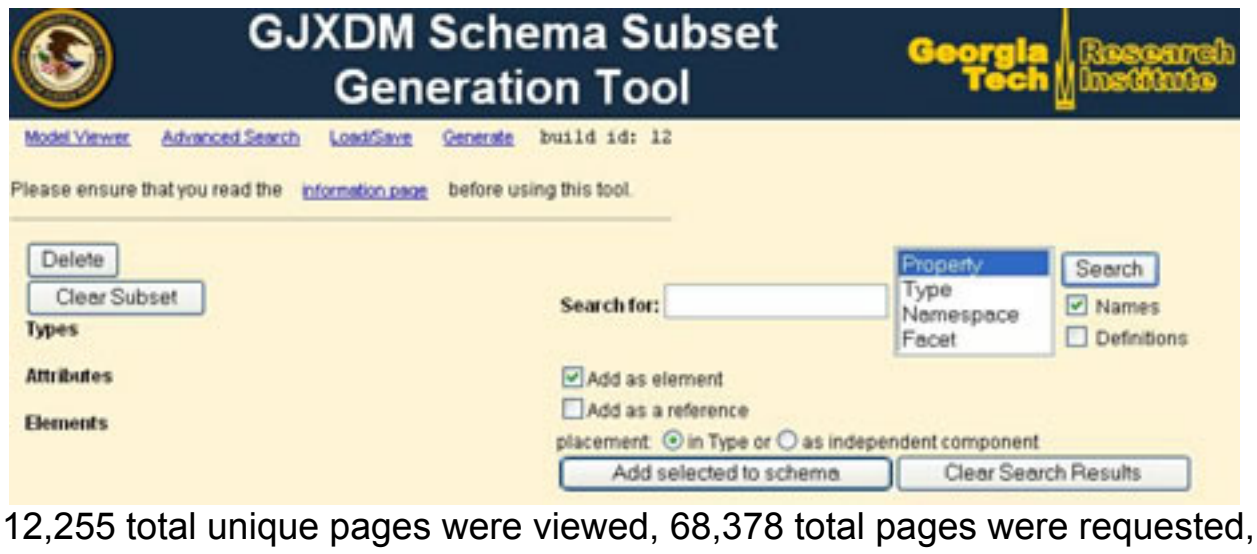
Bugzilla is a feedback mechanism designed for software bug tracking and provides the capability to submit comments, questions, requests, and problems about the use of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and Global Justice XML Data Dictionary (Global JXDD). To report Global JXDM and Global JXDD errors, refer to the Bugzilla Feedback site. For other XML-related feedback, please refer to the Contact page.

Search, Navigate, and Build

- Global JXDM Schema Subset Generation Tool (SSGT)
- Global JXDM Wayfarer

Global JXDM Schema Subset Generation Tool (SSGT)

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) Schema Subset Generation Tool (SSGT) is a valuable tool that assists developers in creating Global JXDM schema subsets, based on the previously published Rules for Schema Subsets. In generating a schema subset, there is one primary, overriding rule: Instances that validate to the schema subset will validate to the full schema.



With the SSGT, developers can navigate the Global JXDM and then select and move any number of desired components into the schema subset being built. The SSGT can also be used for simply searching or navigating the Global JXDM without using the subset generator function.

The SSGT incorporates and replaces the Global JXDM Viewer, which was designed to assist developers in searching the Data Model itself. Beta testing was performed on the SSGT, during which 12,255 total unique pages were viewed, 68,378 total pages were requested, 533 total megabytes were transmitted by the server (bandwidth), 334 schema subsets were generated, and only 4 bugs reported.

While tests performed on schema subsets generated by the SSGT have thus far resulted in accurate subsets, it is anticipated that the use of the tool by developers will provide additional information for improving the SSGT for future releases.

Global JXDM Wayfarer

Wayfarer is an exploration and discovery tool for the Global JXDM, developed by the National Center for State Courts (NCSC). Wayfarer provides a hierarchical overview of the Global JXDM relationships, as well as detailed information about individual elements and types and the relationships between them. Names and descriptions are fully searchable.

Two particularly useful features of Wayfarer are:

1. It provides a dynamic tree view of container-element relationships in the Global JXDM. Branches can be opened and closed at will, and the user can drill down as deep into the tree structure as necessary.
2. It provides a complete list of properties available for a specific element. It does this by tracing the type extension path up to SuperType.

While it was originally created for internal use at the NCSC, Wayfarer has been made available to the general justice community at no cost but with no guarantee or warrantee. For more information and to use the Wayfarer tool, refer to www.ncsconline.org/d_tech/gjxdm/.

Validation Tool

Global JXDM Validator

A Java application, the Global JXDM Validator, is available for validating XML instances. It uses the Apache Xerces Java XML Parser library, which has a highly standards-conformant validator. It does a much better job of validating than some tools and is relatively fast.

Class Hierarchy Tree

Global JXDM Class Hierarchy

The entire Global JXDM Class Hierarchy is represented in a downloadable spreadsheet. This reference is a simple visual representation of all complex-type derivations and simple types in a tree format.

Complex Types

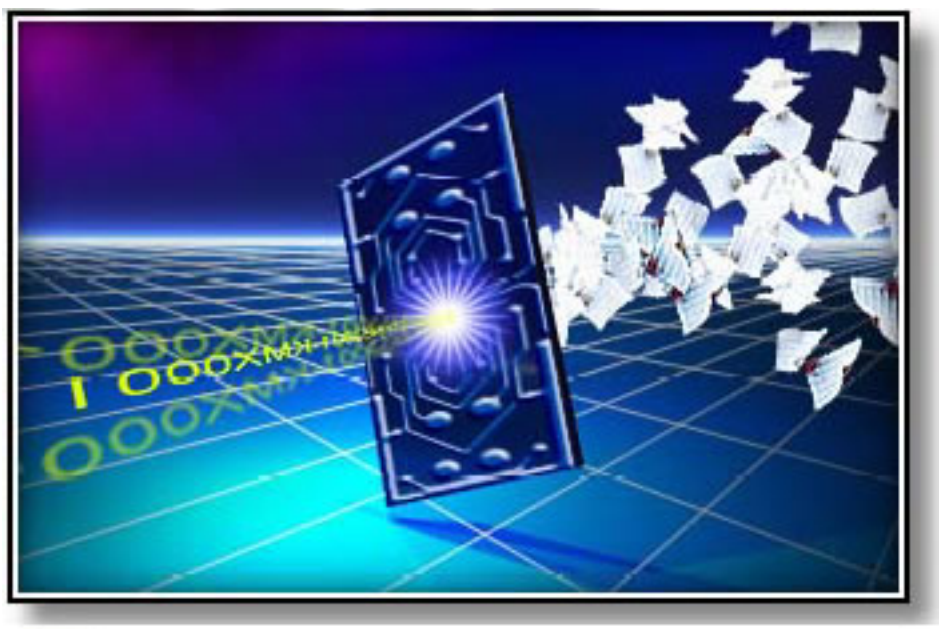
SuperType

- ActivityType
  - AlertType
  - ArrestType
  - AssessmentType
  - BailType
  - BondType
  - BookingType
  - CaseType
    - AppellateCaseType
  - CitationType
  - ConditionGroupType
  - ConditionType
  - ConvictionType
    - DriverConvictionType

Process Modeling

Justice Information Exchange Model (JIEM)

Developed by SEARCH, The National Consortium for Justice Information and Statistics, the Justice Information Exchange Model (JIEM) is a useful tool in planning and implementing justice integration projects using the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). The JIEM is a conceptual framework that defines the universal dimensions of information exchange; a research and planning methodology for modeling the operational dynamics of this information exchange; and a Web-based software application—the JIEM Modeling Tool—that enables data collection, analysis, and reporting by users and researchers. The JIEM is a valuable tool for breaking down criminal justice processes into key decision points, identifying critical areas the justice community needs to share and access information electronically.



SEARCH
The National Consortium for Justice Information and Statistics

The JIEM interfaces with the Global JXDM and allows users to incorporate reference exchanges into their site databases at the outset of their documentation efforts. The JIEM contains hundreds of key exchanges common to most jurisdictions. These key exchanges were developed as a result of years of research among numerous jurisdictions.

JIEM training classes and certification are available for those interested in learning how to use the JIEM for justice integration. Refer to JIEM Training and Certification for more information.

The Justice Information Exchange Model has proven to be valuable in analyzing the flow of criminal justice information and in modeling complex business processes. For more information on the JIEM, refer to http://www.search.org/programs/technology/jiem.asp.

Justice Information Exchange Model (JIEM) Training and Certification

SEARCH
The National Consortium for Justice Information and Statistics

- JIEM Training Classes
- JIEM Certification

JIEM Training Classes

The Justice Information Exchange Model (JIEM) is a conceptual framework that defines the universal dimensions of information exchange; a research and planning methodology for modeling the operational dynamics of this information exchange; and a Web-based software application—the JIEM Modeling Tool—that enables data collection, analysis, and reporting by users and researchers. The JIEM interfaces with the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and is a valuable tool for breaking down criminal justice processes into key decision points, identifying critical areas the justice community needs to share and access information electronically. Refer to Justice Information Exchange Model (JIEM) for more information.

JIEM training classes provide in-depth instruction on the JIEM, are primarily geared toward public-sector individuals, and give participants an opportunity to meet other justice system practitioners facing integrated justice planning and implementation issues. Participants who complete the class will be able to use the JIEM Modeling Tool within their respective jurisdictions.

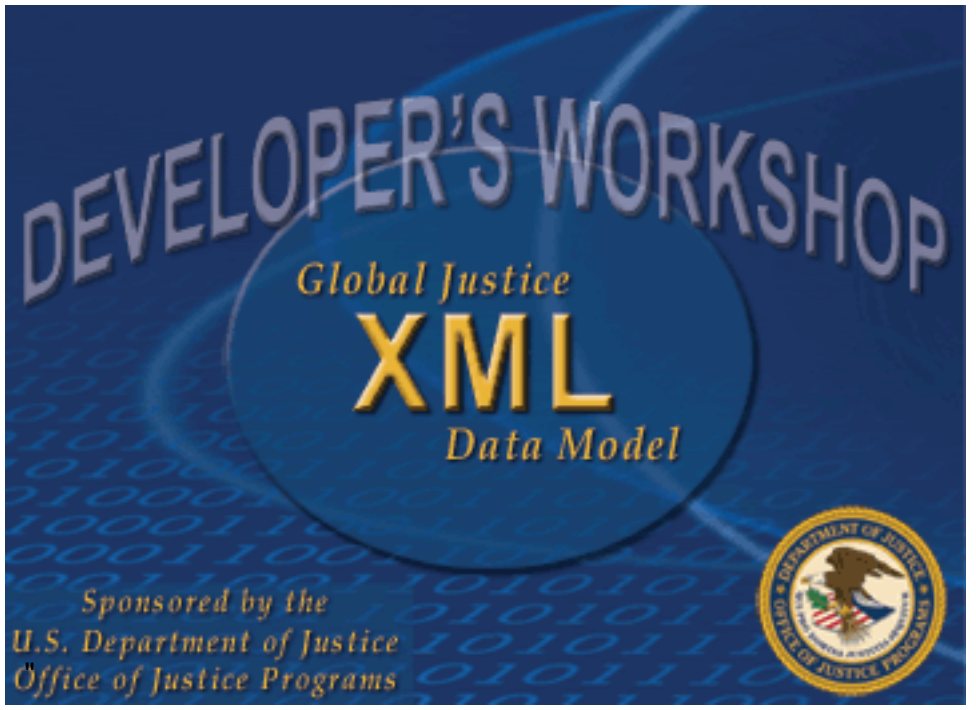
Attendees who satisfactorily complete the course have the opportunity to take the certification examination. For more information on training classes and scheduled training dates, refer to http://www.search.org/programs/technology/jiem-training.asp.

JIEM Certification

The Justice Information Exchange Model (JIEM) Certification Program enables public- and private-sector individuals to receive in-depth instruction on the JIEM and its components. JIEM certification requires participation in the training classes and passing the certification exam. Certified participants will be able to assist multiple justice organizations throughout the nation with modeling justice system information flow and business rules by identifying, describing, documenting, and defining key interagency information exchanges. For more information on JIEM certification, refer to http://www.search.org/programs/technology/jiem-certified.asp.

Global JXDM Developer's Workshops

The U.S. Department of Justice, Office of Justice Programs (OJP), routinely offers Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) Developer's Workshops, sponsored by partnering organizations at different locations throughout the country. The workshops provide about 16 hours of public training, presented over a three-day period, on the Global JXDM. Refer to the Workshop Schedule for a listing of upcoming workshops.



Benefits

Workshop attendees benefit from networking with peers and receive hands-on training from experienced presenters.

Who should attend?

Workshops are specifically designed for developers and practitioners in the field to provide the information needed to enable them to build applications using the Global JXDM and to enable them to use it effectively. Workshops are highly technical. An intermediate working knowledge of XML is recommended, as well as familiarity developing and using complex XML schemas and XML documents to have a good understanding of XML data types and structures.

The computer scientists at the Georgia Tech Research Institute did all the heavy lifting in terms of providing spectacular instruction, but the endorsement of all the sponsoring groups and, most notably, the Office of Justice Programs was also impressive. People were eager to learn about how to apply the model, chomping at the bit to go home with new knowledge to put it to work in computer-based information sharing, and more than willing to share their work with others."

Paul K. Wormeli, Executive Director of the Integrated Justice Information Systems (IJIS) Institute and chair of the Global Training and Technical Assistance Committee

Global JXDM Online Training Materials

Initially designed for Global JXDM Developer's Workshops, the Global JXDM Online Training Materials are a comprehensive educational resource, providing users with access to the workshop presentation slides, streaming video segments, answers to participant questions, program agenda, speaker information, technical documentation, practical exercises, and suggested solutions to in-class exercises.

Global JXDM Listserv

The Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) Listserv is an electronic forum created for the purpose of developing and broadening the community of Justice XML expertise and support for the application of Global JXDM and Global Justice XML Data Dictionary (Global JXDD) elements. The Global JXDM Listserv promotes the exchange of ideas and experiences associated with the Global JXDM and the Global JXDD.

> "This listserv is . . . a valuable tool for community interaction and increasing subject-matter expertise on the Global JXDM . . . . The knowledge base created by the listserv community of practice may help us face new challenges in the implementation of the Global JXDM vision."
>
> **Superintendent Melvin J. Carraway, Indiana State Police and Global Advisory Committee Chairman**

Who Can Join?

Justice and public safety practitioners; managers and policymakers; developers and programmers involved with building applications using the Global JXDM; and local, state, tribal, federal, and private sector communities of practice who are involved in data integration efforts using XML.

What Do People Talk About on the Global JXDM Listserv?

- How to identify the need for implementing Global Justice XML
- Plan development
- Proposals
- Funding
- Hardware and software specifications and acquisitions
- Pilot projects
- Implemented programs (local, state, tribal, and national applications)
- XML literature, research, and other related resources
- Education, training, and conference opportunities

Refer to the Global JXDM Listserv for more information or to apply.

Organizations Utilizing the Global Justice XML Data Model (Global JXDM)

The Organizations Utilizing the Global Justice XML Data Model (Global JXDM) is a reference list of justice agencies compiled for the purpose of providing peer assistance to those entering the planning, development, or implementation stages of an XML-based information sharing project. The list features agencies who are developing or have implemented projects utilizing the Global Justice XML Data Model (Global JXDM) and identifies the version used, the application purpose and role, the project timetable and funding, and any cost and time savings gained. Justice and public safety practitioners may use this resource to contact and obtain development support from peer agencies, submit information on a Global JXDM project not listed, or provide a project update.

What Is XML?

Extensible Markup Language, or "XML," is an open standard base that allows agencies to exchange data, regardless of computer system or platform. XML defines the structure and meaning of data records through simple but carefully defined syntax rules and provides the common framework to facilitate cross-platform data exchange.

With XML, existing systems can remain in place, and the data is translated as it enters and exits each system without changing the meaning of the data or how it appears in the originating system.

XML is designed to transmit both **data** and the **meaning of the data**. It accomplishes this by being a markup language, a mechanism that identifies different structures within a document. Structured information contains both content (such as words, pictures, or video) and an indication of what role content plays or its meaning. XML identifies different structures by assigning data "tags" to define both the name of a data element and the format of the data within that element. Elements are combined to form objects. Refer to the article *Extensible Markup Language (XML) and Its Role in Supporting the Global Justice XML Data Model* for more information.

Justice XML

The justice information technology arena has widely embraced XML as the basis for document exchanges, but this industry-supported open standard would have resulted in little improvement over past justice information sharing methods without a common justice-specific vocabulary and agreed-upon objects.

Justice XML extends XML to the justice and public safety communities by providing a standard vocabulary and semantic building blocks that can be reused and extended by practitioner, integrator, and vendor communities.

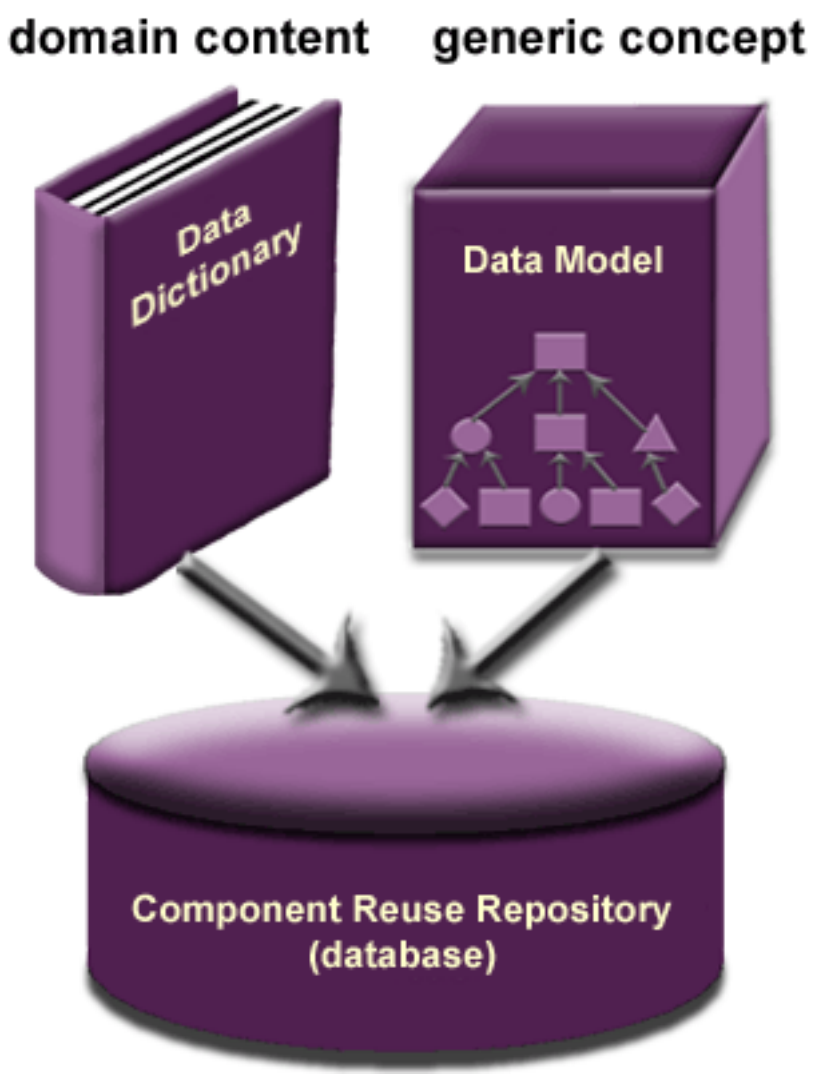
XML can only work well when everyone agrees to use a common vocabulary as a basis for creating information exchanges—and that vocabulary already exists. It is called the Global Justice XML Data Model (Global JXDM). For more information, refer to What Is Global JXDM?

"To protect the American public and help defend against terrorism, criminal justice and law enforcement organizations must establish information infrastructures that enable officers to share data and exchange intelligence efficiently, securely, and accurately across jurisdictional and technological boundaries . . . the technologies best positioned to enable information sharing throughout law enforcement are XML and Web services . . ."

Steven Correll, Executive Director of NLETS – The International Justice and Public Safety Information Sharing Network and chair of the Global Security Working Group

What Is Global JXDM?

- Vision and Purpose
- Global JXDM Versus Global JXDD
- Advantages
- Design Criteria and Goals
- Design Assumptions
- Components and Reference Architecture



The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) is an XML standard designed *specifically* for criminal justice information exchanges, providing law enforcement, public safety agencies, prosecutors, public defenders, and the judicial branch with a tool to effectively share data and information in a timely manner.

The Global JXDM removes the burden from agencies to independently create exchange standards, and because of its extensibility, there is more flexibility to deal with unique agency requirements and changes.

The Global JXDM is an object-oriented data model for organizing the content of a data dictionary, the Global Justice XML Data Dictionary (Global JXDD), in a database. From this database, an XML schema specification can be generated that consistently represents the semantics and structure of common data elements and types required for information exchange within the justice and public safety communities.

There are three primary parts to the Global JXDM: the Data Dictionary (identifying content and meaning), the Data Model (defining structure and organization), and the Component Reuse Repository (a database).

The work accomplished to date, based on participation by practitioners from the justice and public safety communities, has resulted in the creation of a data model that can be used to generate data schema which will facilitate information sharing among the various jurisdictions of those communities. This was done in a manner that reduced the cost of developing the technical solutions required, simplified the process and associated products, and enhanced the interoperability quotient of the end product. The approach combines successful practices in data modeling with recent technology standards for XML schema.

Ultimately, XML and the Global Justice XML Data Model can help to make criminal justice information sharing easier, quicker, and less expensive for agencies by offering standard tools, techniques, and data structures.

With the help of XML and the Global Justice XML Data Model, the opportunity for proactive justice information sharing is enhanced, arming everyone across the justice and public safety communities with the most accurate and up-to-date data to make the very best decisions possible—increasing law enforcement and criminal justice agency efficiency, public safety, and national security.

Organization and Advisory Bodies

- Office of Justice Programs (OJP), U.S. Department of Justice
- Global Justice Information Sharing Initiative (Global)
- Global Advisory Committee (GAC)
- Global Extensible Markup Language (XML) Structure Task Force (GXSTF)
- GJXDM Training and Technical Assistance Committee (GTTAC)
- Development Support and Guidance
- Global Committee Structure Chart

Office of Justice Programs (OJP), U.S. Department of Justice

A strategic goal of the Office of Justice Programs (OJP), U.S. Department of Justice, is to help justice leaders and practitioners enhance information sharing across the justice and public safety communities—at all levels of government—to improve public safety for America's citizens and to increase our homeland security. In support of this endeavor, OJP has provided grant funding and guidance through the Bureau of Justice Assistance (BJA) for the Global Justice Information Sharing Initiative (Global).

Global Justice Information Sharing Initiative (Global)

The Global Justice Information Sharing Initiative (Global) operates under the auspices of the Office of Justice Programs (OJP), U.S. Department of Justice. Global advises the federal government, specifically through the Assistant Attorney General, OJP, and the U.S. Attorney General, on justice information sharing and integration initiatives.

> "The Global Advisory Committee . . . supports information sharing and dialogue across the entire justice community and facilitates the development of products, like Global JXDM, that support the security of our communities, individually, and the nation, collectively."
>
> **Melvin J. Carraway, Superintendent of the Indiana State Police and chair of the Global Advisory Committee**

Global Advisory Committee (GAC)

To help steer and facilitate Global efforts, the U.S. Attorney General reached out to key personnel from local, state, tribal, federal, and international justice entities to form the Global Advisory Committee (GAC). The GAC, through its Working Groups, works collaboratively to address the policy, connectivity, and jurisdictional issues that have hampered effective justice information sharing. The GAC membership reflects the tenet that the entire justice community must be involved in information exchange. Experts represent the following constituencies: law enforcement agencies; prosecutors, public defenders, and courts; corrections agencies; and probation and parole departments. Refer to the Global Committee Structure chart, below, for more information.

Global Extensible Markup Language (XML) Structure Task Force (GXSTF)

Global aids its member organizations and the people they serve through a series of important initiatives. These include the facilitation of the GAC's Working Groups. One such Working Group, the Global Infrastructure/Standards Working Group (GISWG), formed the Global XML Structure Task Force (GXSTF) to identify data requirements, explore XML concepts, and apply XML best practices to design and implement the Global Justice XML Data Model (Global JXDM). The GXSTF is composed of government and industry domain experts (law enforcement, courts, and corrections), technical managers, and engineers.

GJXDM Training and Technical Assistance Committee (GTTAC)

The GJXDM Training and Technical Assistance Committee (GTTAC) is a consortium of organizations engaged in technical assistance and training related to technology in the justice field, specifically the Global JXDM. The GTTAC supports the development of training and technical assistance for the Global JXDM. The Committee was established in January 2004 as an outreach effort for the Global JXDM. It is related to, but external from, the Global Justice Information Sharing Initiative (Global) and is an operating entity on behalf of the Global JXDM to assist the justice community's need to better understand and implement the Global JXDM.

GTTAC's mission is to coordinate the work of national service providers in providing training and technical assistance on issues related to the implementation of the Global JXDM. Major projects include building Global JXDM Information Exchange Package Descriptions, creating a national virtual help desk centered on the Global JXDM, and coordinating regional large-scale Global JXDM training events.

Development Support and Guidance

Researchers at the Georgia Tech Research Institute (GTRI) played a key role in developing the software foundations for the Global JXDM by providing engineering support and technical guidance for the new system as part of the broad-based collaboration involving dozens of agencies and industry partners. GTRI worked with the GXSTF to create a comprehensive product that includes a data model, a data dictionary, and an XML schema that together became known as the Global Justice XML Data Model (Global JXDM).

Numerous agencies and partners contributed to the development and guidance of the Global JXDM, including the U.S. Department of Commerce, Institute for Telecommunication Sciences (ITS); National Telecommunications and Information Administration (NTIA); and the National Institute of Justice (NIJ). For a comprehensive listing of agencies and partners who have contributed to the development and guidance of the Global JXDM, refer to Acknowledgements.

For more information on the history and development of the Global JXDM, refer to History.

News and Press Releases

- News
- Press Releases

News

SLGCP 'FY05 Homeland Security Grant Program' Requiring Global JXDM for Projects Using XML

December 17, 2004

To support homeland security, public safety, and justice information sharing, the Office for State and Local Government Coordination and Preparedness' (SLGCP) Fiscal Year 2005 Homeland Security Grant Program (FY05 HSGP), Office for Domestic Preparedness (ODP), U.S. Department of Homeland Security (DHS), is requiring all FY05 HSGP grantees to use the Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) specifications and guidelines regarding the use of XML.

Announcing the Newest Global JXDM Release, Version 3.0.2

October 27, 2004

The Office of Justice Programs (OJP) and the Global Justice Information Sharing Initiative (Global) have released a new version of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) to the justice community, Version 3.0.2. This release includes the most current code values for schemas for the National Crime Information Center (NCIC)—2000 code tables, definition adjustments, added and deprecated properties, an updated Frequently Asked Questions (FAQs), and more.

Global JXDM for Juvenile Justice

August 4, 2004

As a result of grant funding from the Bureau of Justice Assistance (BJA), Office of Justice Programs (OJP), U.S. Department of Justice, the Integrated Justice Information Systems (IJIS) Institute formed the Juvenile Extensible Markup Language (XML) Committee to review the Global Justice XML Data Model (Global JXDM) for application to the juvenile justice domain, including the development of reference documents for critical exchanges of information between juvenile justice agencies.

Global JXDM Schema Subset Generation Tool Now Available

August 3, 2004

After receiving a generous amount of feedback from participants of the Global Justice XML Data Model (Global JXDM) Developer's Workshop, held May 11-13, 2004, in Atlanta, Georgia, the Global JXDM Schema Subset Generation Tool (SSGT) has been released. This valuable tool provides developers with the ability to create Global JXDM schema subsets based on the previously published Rules for Schema Subsets.

Workshop Develops Global JXDM Reference Exchange Documents for Courts

July 3, 2004

A highly beneficial body of work in support of justice interoperability was produced recently during an intense four-day workshop, held June 21-24, 2004, in Denver, Colorado, for the purpose of building Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) reference exchange documents. Court-related reference exchange documents were compiled for Protection Order, Traffic Citation, Court Disposition, and Sentencing Order.

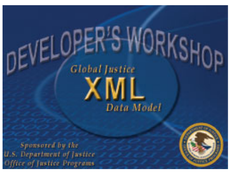
Georgia Tech Helps Provide Foundation for New Justice Information Sharing Initiative

June 28, 2004

This article describes the pivotal role Georgia Tech Research Institute (GTRI) researchers have played in the engineering support and technical guidance of the U.S. Department of Justice-sponsored product, the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM), Version 3.0. Designed to facilitate criminal justice information sharing, the Global JXDM is the result of a broad-based collaboration involving dozens of agencies and industry partners.

Global JXDM Workshop Training Materials Now Available Online

June 14, 2004



The Office of Justice Programs (OJP), together with the Global Justice Information Sharing Initiative (Global), has announced the availability of online training materials for the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). The training materials, originally developed and used for a three-day Global JXDM Developer's Workshop that debuted in May 2004, include a complete workshop program, instructor presentation slides, streaming video segments, and more.

Integration News Case Study: Using XML for Alaska Criminal Justice Data Exchange

April 27, 2004

To achieve statewide criminal justice data integration, Mapping Alaska's Justice InterChanges (MAJIC) team used the Justice Information Exchange Modeling (JIEM) Tool, hired XAware, and utilized the Global Justice Extensible Markup Language (XML) Data Dictionary (Global JXDD) to map bidirectional exchanges between the Court and Public Defender's office for Notice of Appointment of Counsel. Implementation took three days, at a fraction of the estimated project budget.

Global Justice XML Standard Adopted in Arizona

February 3, 2004

On January 22, 2004, Arizona took a giant step forward in data information sharing when the Arizona Criminal Justice Commission (ACJC) adopted the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM), Version 3.0, as the standard that Arizona agencies will use in future technology projects. By applying the Global JXDM standard schemas, agencies will be able to exchange criminal justice information throughout the state.

Pennsylvania's JNET Crafts a Robust Online Driver History Record Tool Using Global Justice XML

December 14, 2003

Pennsylvania's Justice Network (JNET), in cooperation with the Pennsylvania Department of Transportation (PennDOT), debuts its online Driver History Record tool, JNET's first implementation using the Global Justice Extensible Markup Language (XML) Data Dictionary (Global JXDD). This is the most frequently queried tool of JNET's suite of online offerings, providing digital driver photos, demographics, and driver histories to authorized users.

Press Releases

ACT Announces 2004 Intergovernmental Solutions Award Winners—Global JXDM Selected

May 26, 2004

Announcing the Operational Release of the Global Justice XML Data Model, Version 3.0

January 14, 2004

Announcing the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) Listserv

January 16, 2004

Awards

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) was the recipient of a 2004 American Council for Technology (ACT) Intergovernmental Solutions Award for “clearly demonstrating the tremendous progress government agencies at all levels can accomplish through collaboration and the innovative use of technology.” Refer to the 2004 ACT Awards Press Release to read more about the award.

SLGCP 'FY05 Homeland Security Grant Program' Requiring Global JXDM for Projects Using XML

To support homeland security, public safety, and justice information sharing, the Office for State and Local Government Coordination and Preparedness (SLGCP) Fiscal Year 2005 Homeland Security Grant Program (FY05 HSGP), Office for Domestic Preparedness' (ODP), U.S. Department of Homeland Security (DHS), is currently requiring all FY05 HSGP grantees to use the Global Justice Information Sharing Initiative's (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) specifications and guidelines regarding the use of XML.

Extensible Markup Language, or "XML," is an open-standard base that allows agencies to exchange data, regardless of computer system or platform. Interoperability among the justice and public safety communities has been foundationally accelerated by XML through the development and integration of the Global JXDM, a benchmark in justice XML standards that expresses the baseline data needs of justice and public safety communities and their related partners. Conformance to Global JXDM ensures that a basic core set of information is well understood by the justice community and carries the same meaning.

Developed by the Global Initiative, Office of Justice Programs (OJP), U.S. Department of Justice (DOJ), the Global JXDM represents a significant change in the way practitioners develop their information sharing systems. Through the use of common, well-defined data elements that are understood system to system, the Global JXDM enables access from multiple sources and reuse in multiple applications, allowing justice and public safety communities to effectively exchange information at all levels.

The Fiscal Year 2005 HSGP Program Guidelines and Application Kit is now available online at http://www.ojp.usdoj.gov/odp/docs/fy05hsgp.pdf. The FY05 HSGP provides a single application kit and program guidance for the State Homeland Security Program (SHSP), the Urban Areas Security Initiative (UASI), the Law Enforcement Terrorism Prevention Program (LETPP), the Citizen Corps Program (CCP), the Emergency Management Performance Grants (EMPG), and the Metropolitan Medical Response System (MMRS) Program Grants. Through the HSGP Program, local and state emergency prevention, preparedness, and response personnel will receive over $2.5 billion in grant funding to enhance and improve our nation's homeland security efforts.

New and returning applicants may apply for the FY05 HSGP through the Grant Management System (GMS), available online at https://grants.ojp.usdoj.gov/. Instructions regarding electronic submissions through the GMS are provided on the OJP Web site at www.ojp.usdoj.gov/fundopps.htm. Assistance with the GMS may also be obtained by calling (888) 549-9901. The completed FY05 HSGP application must be submitted via GMS no later than **January 16, 2005**.

For additional information, please contact your Preparedness Officer or the ODP Helpline at (800) 368-6498.

Announcing the Newest Global JXDM Release, Version 3.0.2

The Office of Justice Programs (OJP), together with the Global Justice Information Sharing Initiative (Global), has officially issued a newer version of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) to the justice community—Version 3.0.2. This latest release of the Version 3.0 Global JXDM series is enhanced to increase the ability of justice and public safety communities to share justice information at all levels—laying the foundation for local, state, and national justice interoperability.

The Global JXDM is a comprehensive product that includes a data model, a data dictionary, and an XML schema. The Global JXDM is sponsored by OJP, with development supported by the Global XML Structure Task Force (XSTF) which works closely with researchers at the Georgia Tech Research Institute (GTRI). The XSTF is composed of government and industry domain experts (law enforcement, courts, and corrections), technical managers, and engineers.

New releases are issued by the XSTF, which reviews and evaluates each version of the Global JXDM. The XSTF solicits feedback from technical experts and practitioners in both industry and government and authorizes Global JXDM changes based on this feedback. All approved additions, deletions, and modifications are applied to future releases, with a cumulative change log published along with each release. When a reasonable number of updates are approved by the XSTF, a new version is released.

Since its first prerelease in April 2003, the Global JXDM has continued to undergo intensive reviews, receive feedback and error reports online from the public, and provide a Global JXDM Listserv discussion forum for sharing expertise and support. Today, more than 50 law enforcement and justice-related projects have been implemented utilizing the Global JXDM, further demonstrating the flexibility and stability of the Global JXDM.

Some of the enhancements incorporated into Version 3.0.2 include the most current code values for schemas for the National Crime Information Center (NCIC)-2000 code tables, definition adjustments and corrections, the addition of more properties and the deprecation of others, and an updated Frequently Asked Questions (FAQs) resource that incorporates content from the *Global JXDM Version 3.0 Reference Notes* along with added FAQs. In addition, elements can now have "null" values (i.e., no data content between the start and end tag), and the Schema Subset Generation Tool (SSGT) now supports multiple versions of the Global JXDM.

An important developmental highlight is that the Global JXDM, Version 3.0.2, is forward compatible with all XML instances written for Global JXDM, Version 3.0. Global JXDM, Version 3.0, instances validate with all 3.0.2 schemas and schema subsets. Global JXDM, Version 3.0, will remain available indefinitely.

For more information on the Global JXDM, Version 3.0.2, and the resources and tools associated with this product, refer to the Global JXDM Web site at http://it.ojp.gov/gjxdm. To specifically access the Global JXDM, Version 3.0.2, refer to http://it.ojp.gov/jxdm.

Global JXDM for Juvenile Justice

In early 2004, as a result of grant funding from the Bureau of Justice Assistance (BJA), Office of Justice Programs (OJP), U.S. Department of Justice, the Integration Justice Information Systems (IJIS) Institute formed the Juvenile Extensible Markup Language (XML) Committee to review the Global Justice Information Sharing Initiative (Global) Justice XML Data Model (Global JXDM) for application to the juvenile justice domain. The Committee's objective was to identify specific extensions that should be made to the Global JXDM to facilitate the exchange of information related to juvenile justice.

The Committee began researching and gathering information on other jurisdictions' and organizations' efforts to develop XML tags for the juvenile and at-risk youth community. Through this process, the Committee discovered that other projects had been implemented specific to juvenile justice and these would provide excellent opportunities for collaboration. As a result, the Committee has developed a collaborative agreement for the purpose of sharing project information between agencies and foster participation. One such implementation is the Child Welfare XML Working Group, Administration of Children and Families, U.S. Department of Health and Human Services, who has agreed to share information and to allow mutual committee participation between Child Welfare and the Juvenile XML Committee.

Through their research, the Committee has also identified jurisdictions that are in the initial planning and development stage of defining juvenile XML data tags and schemas. These include local and state agencies.

Committee membership includes Committee Chair Stephanie Rondenell, ACG, Inc.; Greg Pierce, NETdelivery; and Terrie Bousquin, Greacen Associates, LLC.

Future plans include the coordination of the development of reference documents that can be shared as a model of specific and critical exchanges of information between agencies and organizations engaged in juvenile justice.

Once completed, the Justice XML standards and schemas will be registered and available through the Justice Standards Clearinghouse for Information Sharing (JSC), located at the Office of Justice Programs (OJP), U.S. Department of Justice, Information Technology Initiatives Web site.

On August 16-18, 2004, the Committee will be sponsoring a workshop for both industry and government participants in Albuquerque, New Mexico. This session will bring together industry and subject-matter experts from jurisdictions that are interested in implementing XML-based information exchanges using the Global JXDM.

For further information on this project or the workshop, contact Juvenile XML Committee Chair Stephanie Rondenell at (303) 979-8722 or by e-mail at srondell@acg-online.net.

Global JXDM Schema Subset Generation Tool Now Available

After receiving a generous amount of feedback from participants of the Global Justice XML Data Model (Global JXDM) Developer's Workshop, held May 11-13, 2004, in Atlanta, Georgia, the Global JXDM Schema Subset Generation Tool (SSGT) has been released. This valuable tool provides developers with the ability to create Global JXDM schema subsets based on the previously published Rules for Schema Subsets.

In addition to giving the developer the ability to create schema subsets, the SSGT incorporates and replaces the Global JXDM Viewer, which was designed to assist developers in searching the data model itself. Additional SSGT functionality is also planned for the future. The tool's developers, at the Georgia Tech Research Institute (GTRI), expect to eventually provide save, download, and upload wantlist features with an improved wantlist interface; on-the-spot user feedback through error messages and help tips to improve usability; a recursive add-and-delete function; and a user's manual.

The GTRI research team conducted beta testing on the SSGT for a period lasting from June 1, 2004 to July 23, 2004. During this period, 12,255 total unique pages were viewed; 68,378 total pages were requested; 533 total megabytes were transmitted by the server (bandwidth); 334 schema subsets were generated; and only 4 bugs were reported.

The GTRI research team is very interested in the experiences of developers using the SSGT related to the tool's usability and functionality. While tests performed on schema subsets generated by the SSGT have so far resulted in accurate subsets, it is anticipated that the use of the tool by developers will provide additional information for improving the SSGT for future releases. Developers are encouraged to report bugs, problems, and errors (perceived or real); ideas for new features, functions, and capabilities; and suggestions for improving the user interface. Developers can submit feedback at http://justicexml.gtri.gatech.edu/feedback/.

Workshop Develops Global JXDM Reference Exchange Documents for Courts

A highly beneficial body of work in support of justice interoperability was produced recently during an intense four-day workshop, held June 21-24, 2004, in Denver, Colorado, for the purpose of building Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) reference exchange documents to support information exchange for the courts.

The Global JXDM is an XML-based framework enabling the entire justice and public safety community to effectively share information at all levels—laying the foundation for local, state, and national justice interoperability. Developed by Global and the Office of Justice Programs (OJP), the Global JXDM is an object-oriented data model comprised of a well-defined vocabulary of approximately 2,500 stable data objects, or reusable components, that facilitate the exchange and reuse of information from multiple sources and multiple applications.

The event was hosted by the Colorado Administrative Office of the Courts (AOC) and sponsored by SEARCH, the National Consortium for Justice Information and Statistics; the Organization for the Advancement of Structured Information Standards (OASIS); and the National Center for State Courts (NCSC).

"…I just wanted to say thank you for last week. I feel this was a very successful effort and am glad that I was asked to participate. You did a wonderful job in pulling this together so quickly and keeping us on track. I hope that there will be thought given to continuing this effort to build more Court Reference Documents. There is much work to be done and if we can keep up the momentum, we can add a lot of value to the community at large.

Once again, thank you for the excellent leadership!"

Nancy Rutter
Data Administrator
Maricopa County, Arizona, ICJIS

Workshop participants included AOC representatives from California, Colorado, Missouri, and Washington. Also attending were representatives from Maricopa County, Arizona; Los Angeles County, California; Pennsylvania's Justice Network (JNET); SEARCH; NCSC; OASIS; and OJP. The purpose of the workshop was to collaborate and compile court-related Global JXDM reference exchange documents for Protection Order, Traffic Citation, Court Disposition, and Sentencing Order.

The first day of the workshop encompassed collaborative work on the exchange document for Protection Order. As a result of this teamwork, the group recognized the need to develop an accurate domain data model as a critical first step. On the second day, the team divided into work groups for each document and constructed a domain object model, representing the various components of the exchange document. From that point, they began the

process of mapping the objects and their attributes to components of the Global JXDM. Out of this work each group generated a set of schemas (subset, extension, and document), based on the mapping, as well as an XML instance illustrating the content. Georgia Tech Research Institute (GTRI) was on-hand via teleconference and provided technical support and recommendations during the process. GTRI is a key player in the development of the Global JXDM who has continued to provide the software foundations for the Global JXDM, as well as engineering support and technical guidance.

The reference exchange document "packages" produced as a result of this workshop will eventually be vetted and/or substantively validated by various entities and authoritative sources, following an expanded technical review and horizontal analysis by the members of the Reference Document Team. Final work product will be submitted through the Global XML Structure Task Force (XSTF), a group under the Global Advisory Committee's (GAC) Infrastructure/Standards Working Group (GISWG). The XSTF was responsible for identifying the data requirements for, exploring XML concepts, and applying XML best practices to the design and implementation of the Global JXDM. It is composed of government and industry-domain experts (law enforcement, courts, and corrections), technical managers, and engineers.

Additional Global JXDM Reference Exchange Document workshops are being planned by SEARCH for the near future. These workshops will focus on building documents to support information exchange for the law enforcement, corrections, and prosecutor domains. These workshops will be a collaborative effort among SEARCH, OASIS, and various justice entities, such as the International Association of Chiefs of Police (IACP) and the Corrections Technology Association (CTA). In addition, several practitioners have offered to host upcoming reference document workshops in their agencies.

Jurisdictions will be able to leverage these Global JXDM reference exchange documents and simply modify them to meet any unique data exchange needs, rather than having to build from scratch from the Global JXDM. These documents will save resources and link development efforts to emerging national and international standards, and support interoperability objectives among justice agencies.

Global JXDM Workshop Training Materials Now Available Online

The Office of Justice Programs (OJP), together with the Global Justice Information Sharing Initiative (Global), has announced the availability of online training materials for the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM). The training materials, originally developed and used for a three-day Global JXDM Developer's Workshop that debuted in May 2004 in Atlanta, Georgia, serve as a post-workshop repository that includes a complete workshop program, instructor presentation slides, streaming video segments, handouts and downloads, practical exercises and suggested solutions, questions and answers, and lessons learned.

The Global JXDM is an XML-based framework enabling the entire justice and public safety community to effectively share information at all levels—laying the foundation for local, state, and national justice interoperability. Developed by the Global Initiative and OJP, the Global JXDM is an object-oriented data model comprised of a well-defined vocabulary of approximately 2,500 stable data objects, or reusable components, that facilitate the exchange and reuse of information from multiple sources and multiple applications.

The Global JXDM Developer's Workshop was designed as a technical training seminar that featured hands-on practical exercises and taught by a broad range of practitioners in the field. Georgia Tech Research Institute developers and specialists, who were instrumental in developing the technical foundation behind the Global JXDM, designed and presented most of the curriculum. Topics included the fundamentals of the Global JXDM, external enumerations, constraints, extensions and substitutions, references and relationships, viewing and schema subset tools, and lessons learned.

Speaker, Paul K. Wormeli, Executive Director of Integrated Justice Information Systems Institute (IJIS) and chair of the Global Training and Technical Assistance Committee, commented, "The computer scientists at the Georgia Tech Research Institute did all the heavy lifting in terms of providing spectacular instruction, but the endorsement of all the sponsoring groups and, most notably, the Office of Justice Programs was also impressive. People were eager to learn about how to apply the model, chomping at the bit to go home with new knowledge to put it to work in computer-based information sharing, and more than willing to share their work with others."

A total of 325 developers and managers attended this event, coming from 40 states, consisting of an equal number of industry and government representatives. "What is most notable, and should be the lesson learned for the future, is that it is possible to build broad coalitions to deal with significant issues in criminal justice technology, and to do it quickly. There will be a strong demand for follow-on events to this one, and its success and impact should be the premise for future partnerships in progress in this community," said Mr. Wormeli.

Another workshop is currently scheduled for July 6-8, 2004, in Anchorage, Alaska. This workshop is sponsored by the National Law Enforcement and Corrections Technology Center – Northwest (NLECTC–Northwest), a program of the National Institute of Justice, in cooperation with the University of Alaska, Anchorage, and is part of a larger event—the First Annual NLECTC–Northwest Summer Justice Institute, held June 28 through July 9, 2004. Attendees of the Institute will explore practical applications of innovative technologies currently in use, as well as technologies not yet available, but on the horizon. A third workshop is being planned for the fall in Syracuse, New York.

For more information on the Global JXDM and future developer's workshops, go to www.it.ojp.gov/gjxdm. For information on the Global JXDM workshop training materials, go to http://justicexml.gtri.gatech.edu/developerworkshop/index.html.

Case Study: Using XML for Alaska Criminal Justice Data Exchange

by Steve Horneman and Nancy LaPlaca

Steve Horneman has over 11 years experience in the IT and software industries. Prior to becoming the Director of Marketing for XAware, Inc., Steve served in various leadership capacities at DEC, Quantum and Compaq. He has been instrumental in growing XAware's Criminal Justice Integration Practice. Steve is a graduate of the University of Colorado in Marketing, with an MBA in Finance. He can be reached at shorneman@xaware.com.

Nancy LaPlaca, J.D., worked on justice integration issues for the State of Arizona for five years for the Arizona Supreme Court and the Criminal Justice Commission. She helped develop Arizona's statewide criminal justice data dictionary and common charge table, drafted statute and rule changes to improve reporting, and worked with counties to determine criminal justice business process flows. Nancy's private sector experience includes criminal justice consulting with Sybase, Inc. and XAware, Inc. She can be reached at nancy@xaware.com.

XAware, Inc. is a worldwide leader in XML enablement, data integration, and information exchange. From a single point of access, users can query, view, and update information from dozens of data sources. XAware's drag-and-drop environment reduces the need to write complex custom code to retrieve, translate, manipulate, and exchange information. XAware utilizes web services and can implement Justice XML. XML "views" of data from different systems can be created, updated, and then decomposed and sent back to the original data source.

The State of Alaska used SEARCH's JIEM (Justice Information Exchange Model) tool to map out thirty-six exchanges. Rather than continue mapping hundreds of exchanges, Alaska hired XAware to help implement an XML-based exchange between the Court and Public Defender for Notice of Appointment of Counsel. Implementing this exchange took XAware and Alaska three days.

Every justice agency in the U.S. is acutely aware of the lack of electronic data sharing. Over the past two decades, approaches to sharing justice information have changed dramatically. Integration efforts have included point-to-point, proprietary interfaces, centralized repositories and, most recently, a network-based approach. Traditionally, interfaces were brittle, meaning custom code was required, and re-writing was required if any agency changed applications or database. Some jurisdictions find data repositories a necessary part of their IT infrastructure. Statistical analysis may require that persistent data be available. However, data repositories have ongoing maintenance costs, technologies can become out-of-date, and system performance issues are common problems. Bulk porting of data sets is often necessary.

Most recently, agencies have begun considering network-based integration. Users access information on-demand, and stakeholder agencies maintain ownership of data. Network-based integration using XML can include a data warehouse, but data persistence is not required. XML-based integration uses standardized protocols like SOAP (Simple Object Access Protocol) and WSDL (Web Services Description Language) to exchange information over the web.

Justice XML

Justice XML is the common articulated language that drives a network-based approach. The standards created by Justice XML allow agencies to exchange information in a platform-, application- and vendor-neutral environment.

Justice XML was created by the U.S. Department of Justice (DOJ) and Georgia Tech Research Institute. IJIS, the Institute for Justice Information Systems, is a non-profit organization dedicated to helping justice agencies make the best use of technology to share information. The Global Justice XML Data Dictionary Schema (GJXDDS) was first released in June 2002. Both DOJ and IJIS have embraced XML as the best technology to quickly achieve interagency exchanges.

Justice XML is standardizing data elements and documents and developing schema for rap sheets, court filing records, driver records, arrest warrants, charging documents, and potentially hundreds of other documents. For more information, see: http://it.ojp.gov/initiatives/files/JusticeXMLStructureTaskForceReport.doc.

Global Justice XML Data Dictionary (GJXDD) work groups are developing common, well-defined data elements. The GJXDD group recognizes that the full schema is very large and over-inclusive, and that many agencies will only use a small percentage of the elements. They are working on a tool that will allow agencies to pick and choose parts of the schema. Some customization of schemas will also be allowed. For example, an agency could restrict the field length for a name to 30 characters, or filter out codes like

the National Crime Information Center's (NCIC's) long list of vehicle codes. Unique, local components could also be added as long as they fit GJXDD guidelines. GJXDD can be found at: www.it.ojp.gov/jxdd/prerelease/3.0.0.1/JusticeXML DataDictionary.pdf.

The DOJ's goals for Justice XML are to maximize data sharing, object reusability, and extensibility, easy mainte-nance, and employ current technologies and best practices–for free! Although adoption of Justice XML is voluntary, it will eventually be the standard for all justice agencies.

> ***"Network-based integration using XML can include a data warehouse, but data persis-tence is not requ-ired."***

What Are Web Services and Service-Oriented Architecture?

Web Services Overview

Web services are loosely coupled software components delivered over Internet standard technologies. They enable enterprises to create interlinked, interactive systems that can communicate in a common dialect with each other. Web services are defined by three XML-based components: Universal Description, Discovery, and Integration (UDDI) for registering and discovering web services, Web Service Description Language (WSDL) for contacting/specifying the details of the service to be provided and describing the communication between the provider and the user, and the SOAP protocol for actually carrying the message and carrying out the procedure call aspects on all interactions. SOAP defines a uniform way of passing XML-encoded data. It allows remote procedure calls using HTTP (Hyper Text Transfer Protocol), allowing communication via the internet between remote systems. The internet is the physical network infrastructure, and SOAP is used to communicate XML messages via HTTP.

Service-oriented architecture has been around for some time, but until common standards like XML, SOAP, and WSDL existed, there was no practical way to use it. XML, SOAP, UDDI, and WSDL are inter-operable and platform-neutral.

Web services run over HTTP and TCP/IP networks, just like web pages. Integration using XML and web services can be implemented one exchange at a time. XML's revolutionary premise is that data can reside anywhere: in a database, web pages, flat files, spreadsheet, etc. An XML message is converted to a request that the data source being queried can understand, and the results are converted back to XML. The programming and processing are transparent and take place in a web server.

What's so Great About Web Services?

The real value of web services is that its benefits are both immediate and long-term. Immediate benefits include rapidly implemented data exchanges, a one-exchange-at-a-

XAware's secure network-based information sharing approach

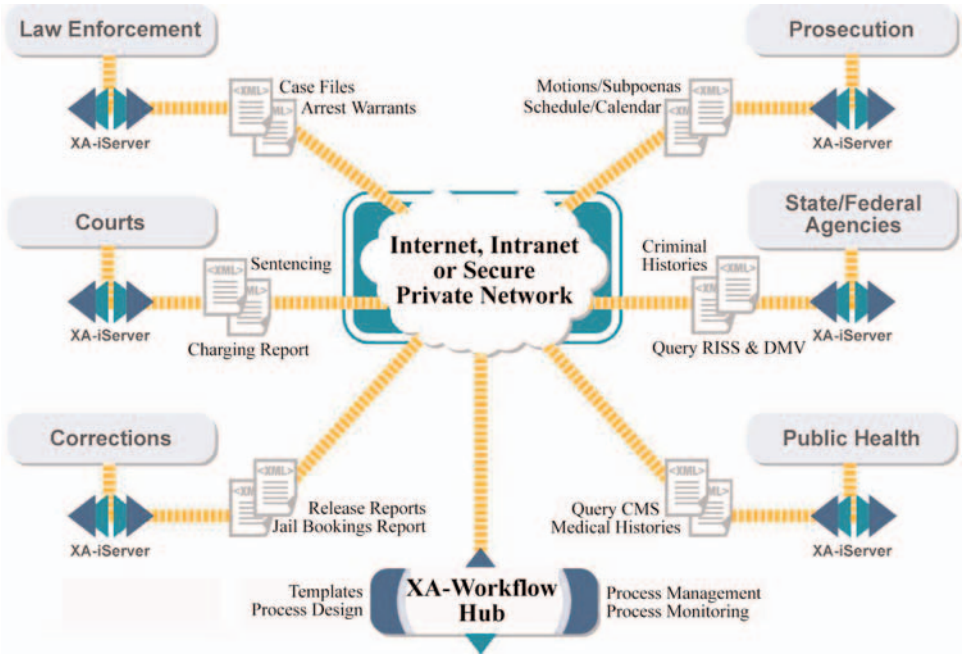
Key Features of XML-Based Integration	Key Features of MXL-Based Integration
- COTS and industry standards-based approach to justice information sharing	- Simpler and more cost-effective than point-to-point and data warehouses
- Information Exchange from any application or database, on any platform, to any client	- Flexible and scaleable - as standards evolve and project scopes change
- Full bi-directional access with query, push, pull, publish, and subscribe	- Original and target data can be updated or returned in initial state
- Synchronous or asynchronous transfer protocols based on events or triggers	- Authentication, authorization, and encryption
- Full support for XML, Justice XML, and Web services	- Complete consulting, customization, and implementa-tion services available

continued on page 10

time approach, and reuse data of XML objects. Once an object is created, it can be added to a library of "create-once, use-many" XML objects, and served to any data source that can process XML. Object reuse means that as each successive exchanges use objects already in the library, the cost to build each exchange goes down.

Objects are called "loosely-coupled" because the object is independent of the source. This allows agencies to easily change vendors or technologies by re-mapping the data objects to the new source. Since program logic calls the object—and not the source—there's no need to change the object if the source changes. If an agency changes its application or database, a simple re-mapping to the new data source is all that's needed.

Using Web services for data source access rather than hard-coded logic adds flexibility. The client data source(s) can know less about the system accessing it, and must only be able to decode the XML stream and use SOAP messages. Modifications are much easier than developing application-specific interfaces.



Alaska Creates MAJIC

In July 2002, the State of Alaska organized a team of criminal justice personnel from the Alaska Court System, Department of Public Safety (DPS), Anchorage Municipal Prosecutor's Office, Public Defender Agency, University of Alaska Justice Statistical Analysis Center and the National Law Enforcement and Corrections Technology Center–Northwest (NLECT-NW), to look at how to best achieve interagency information exchanges. The team submitted a charter to the Criminal Justice Information Advisory Board (CJIAB) for MAJIC (Mapping Alaska's Justice InterChanges). Alaska Statute 12.62.100 requires that the CJIAB advise DPS and other justice agencies on developing and operating criminal justice information systems. The project obtained approval by the CJIAB Chair and MAJIC began.

"Law Enforcement and Corrections (LE&C) officers in Alaska and other remote areas of the United States face unique challenges to crime prevention, investigation, and rehabilitation efforts."

The National Law Enforcement and Corrections Technology Center—Northwest

Law Enforcement and Corrections (LE&C) officers in Alaska and other remote areas of the United States face unique challenges to crime prevention, investigation, and rehabilitation efforts. NLECT-NW was established to provide assistance in defining LE&C's requirements for information and operational technology, with specific attention toward technologies that support law enforcement and corrections under the extreme weather conditions and vast distances of rural Alaska and other parts of the United States.

A program of the National Institute of Justice, NLECTC-NW was founded in 2001 in partnership with Chenega Technology Services Corporation and identifies, evaluates, demonstrates, and assesses technology applications for state and local law enforcement and corrections agencies.

Staff at the NLECTC-NW partnered with MAJIC team members to assist in the location of technologies, training, and tools to assist in the mission of achieving criminal justice data integration across the state. Because of the far-reaching impact of this mission, NLECTC-NW has made support of this group a priority since its inception, both in funding and in providing staff.

After a two-day training session, the team began modeling exchanges—identifying the agencies, documents, events, and conditions involved in each exchange. The

team initially thought that the entire universe of exchanges should be mapped before implementation, but later decided that more value would be achieved by demonstrating the effectiveness of JIEM by implementing a proof of concept exchange using XML. Thirty-six exchanges were documented for the proof of concept.

The Alaska team decided to use an XML and Web services-based architecture, which allows bi-directional exchanges–the ability to select and extract data from one agency's database and insert it into another agency's database.

The Institute for Justice Information Systems Recommends XML

IJIS, the Institute for Justice Information Systems, is a non-profit organization dedicated to helping justice agencies make the best use of technology to share information. IJIS is part of a project sponsored by the Global Justice Information Sharing Advisory Committee (GAC), under the U.S. Department of Justice (DOJ). GAC is charged with facilitating standards-based electronic information sharing within justice and law enforcement. The broad scope is essential, since eventually information will be shared by a large number of agencies, from police to prosecutors to motor vehicles agencies. In June 2002, the group produced the Global Justice XML Data Dictionary Schema (GJXDDS). The Global Justice XML Data Dictionary (GJXDD) specification includes a Data Dictionary, XML Schema and Data Model. This means that each justice agency–whether law enforcement, courts, prosecution, defense, corrections, probation, motor vehicles or any other interacting agency–will utilize a common description of data elements.

> ***"XML drag-and-drop tools create on-demand views of many different agency data sources, including bi-directional exchanges–essentially allowing one to extract from one data source and insert into another."***

MAJIC's Exchange between the Courts and Public Defender

For the proof of concept, the MAJIC team chose an exchange between the Alaska CourtView application and the Public Defender Agency, requiring bi-directional exchange between an NT and Novell network and SQLServer 2000 database to Access97. The proof of concept was for a single location handling over 2,500 exchanges. When fully implemented, more than 15,000 paper and manual appointment of counsel exchanges that occur each year between these agencies will be automated.

The MAJIC team had expected to spend hundreds of thousands of dollars just mapping exchanges. However, JIEM allowed the project team to efficiently accomplish mapping and Alaska hired XAware to implement exchanges for a fraction of the estimated project budget.

MAJIC's future goals include implementing a second, more complex project, perhaps mapping exchanges involving Conditions of Release (bail conditions). Currently, this process is entirely manual, leaving law enforcement and other agencies without online access to critical information about release conditions. The Alaska Court system is poised to automate distribution of this data as part of its court application implementation. Once the proof of concept project is implemented in the initial court location, the Public Defender Agency and courts intend to refine and expand the exchange to other court locations.

XML Exchanges: How Do They Work?

XML drag-and-drop tools create on-demand views of many different agency data sources, including bi-directional exchanges–essentially allowing one to extract from one data source and insert into another. An XML integration server can process data from internal systems to any outgoing XML schema and process inbound XML schemas to any number of internal systems without the need to write code. Information from many different sources can be aggregated into a single XML view.

Connectivity to other agencies, such as Motor Vehicle records can be added as needed. XML-enabling legacy systems using traditional custom code can be expensive and risky.

Security

The exchange XAware implemented includes XAware authentication, authorization and encryption by utilizing the existing capabilities within typical customer application server environments. End-user authentication is provided by use of an ID and password on the presentation layer. Authentication is provided by passing the appropriate credentials in the Web services request. HTTPS (Hypertext Transfer Protocol over Secure Socket Layer) provides 128-bit encryption, essential for passing justice information over the Internet.

continued on page 22

Global Justice XML Standard Adopted in Arizona

The future of justice information sharing in Arizona has changed. On January 22, 2004, the **Arizona Criminal Justice Commission (ACJC)** adopted the Global Justice Extensible Markup Language (XML) Data Model (GJXDM), version 3.0, as the standard that Arizona agencies will use in future technology projects. Today, Arizona agencies share information through propriety software interfaces that are developed and maintained at a high cost to the individual agencies. In the future, agencies will be able to use standard justice XML schemas to share data. The GJXDM was specifically designed to help organizations exchange information from multiple sources and reduce application development costs through the use of standard application components.

"The movement of Arizona to the Global Justice XML standard is a giant step forward towards standardization between information systems in the state," said Gerald Hardt, ACJC's Records Program Manager. "The movement will also be a tremendous assist to vendors wishing to do business in the state."

Adoption of the GJXDM in Arizona was championed by ACJC's Executive Director Michael Branham. Branham has also added a member to the Commission's staff to guide the development of new justice information technology initiatives and maintain Arizona's version of the Data Model. The ACJC is legally mandated under Arizona law to coordinate, monitor, and report on all Arizona criminal justice programs and will serve as a neutral party in the implementation of the Data Model. Adoption of the GJXDM has spurred a real interest among justice practitioners in Arizona to learn about XML and the use of schemas for exchanging information on offender booking, sentencing, and e-citation. The ACJC Technology Team is scheduled to create subcommittees to work on these issues in 2004.

For more information on the Arizona Criminal Justice Commission, go to **http://acjc.state.az.us/**. For specific information regarding the ACJC's adoption of the Global Justice XML Data Model, version 3.0, please contact Gerald Hardt at:

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Phoenix, AZ 85007
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Pennsylvania's JNET Crafts a Robust Online Driver History Record Tool Using Global Justice XML

In August, 2003, Pennsylvania's Justice Network (JNET) deployed its online Driver History Record application, a cooperative effort between JNET and the Pennsylvania Department of Transportation (PennDOT), which is JNET's debut implementation of the Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Dictionary (GJXDD), adding yet another XML standard JNET has mastered to support justice information sharing.

JNET, recognized as a national model for information sharing, was initiated in May 1997 with the founding vision to enhance public safety through the integration of justice information throughout the Commonwealth of Pennsylvania. JNET is a collaborative effort of municipal, county, state, bordering states, and federal justice agencies that developed and provided an online, secure, integrated justice system that allows participating agencies access to driver and offender records, and other justice information.

The GJXDD, a benchmark in justice XML standards, was developed by the Global Initiative, Office of Justice Programs (OJP), U.S. Department of Justice (DOJ). The GJXDD is composed of about 300 data objects, or reusable components, that have inherent qualities that enable access from multiple sources and reuse in multiple applications, allowing the entire justice and public safety community to effectively share information at all levels. The development of the GJXDD represents a significant change in the way practitioners develop their information sharing systems.

Prior to JNET, each Pennsylvania agency had its own computer and database systems which resulted in a fragmented justice environment where requests for critical information took days or weeks to get to the appropriate agencies. Today, JNET helps to solve the disparate problem and represents an unprecedented leap forward in information sharing and cooperation.

"It's a phenomenal tool to both the end user and to the justice process," said Chad Firestone, JNET Communications Manager, "because of the way it was done in the past." When an agency or individual wanted to obtain a driver history, they would fill out a paper form and submit it by mail. It could take two to three weeks for a request to be sent, processed, and returned. There were thousands of forms being processed each month. "Access to this information via JNET has provided an incredible time and cost benefit. JNET has reduced the response time from weeks to seconds," said Firestone.

By using XML to establish internal messaging standards, JNET was able to avoid traditional "turf issues" by leveraging agency's existing computer and database systems, thus ensuring agency independence and control over their data. Agencies publish pertinent case information to JNET, and other justice agencies subscribe to the desired information. As a result, a case is built on an individual as they move through the justice system.

JNET's Driver History Record utilized the GJXDD data element standards to develop a robust Driver History Record tool. Now, "JNET users can directly obtain digital Pennsylvania Department of Transportation (PennDOT) driver's license photographs and demographic information – the JNET application most frequently queried," said Dwight McKee, Senior Special Investigator and JNET Coordinator for the Pennsylvania Office of Inspector General and Chair of the JNET Data Conflict Subcommittee. According to McKee, "With the proper user role, JNET users can access digital photos and signatures, address information, and driver's records, simultaneously."

Zemin Luo, JNET Senior Architect, stated that "in developing the Driver History XML schema, about 80% of the data elements were extracted from GJXDD, with the remaining 20 percent extended to meet JNET project requirements." The GJXDD is a reliable, stable justice standard that can be customized, evolving as community requirements change.

In a project survey, Luo expressed that "while learning GJXDD standards and developing XML schemas based on GJXDD caused some time delay in deploying the [Driver History Record] project, JNET expects to save resource-related time, and costs, as subsequent GJXDD projects occur. GJXDD will be highly reusable from a XML and object perspective; therefore, JNET projects that real time savings will be gained in future GJXDD-based projects." The JNET Driver History Record is the first GJXDD-based application for JNET who is in the process of developing additional GJXDD 3.0-based functions.

JNET's overall success and, specifically, its Driver History Record, has caught the attention of other states. CriMNet, which connects Minnesota's criminal and juvenile justice systems, plans to capitalize on JNET's GJXDD application.

"We are excited about using their standards for our drivers and vehicle services (DVS) data . . . GJXDD is structured in a very flexible way that we can add our own state codes and still be able to reuse most of the work that JNET is doing," stated Dan McCreary, an Information Technology (IT) Consultant for CriMNet. "We will be creating an XML Web service search adapter for our driver's license records . . . allowing users to search driver's records and return XML documents that have very consistent tagging of data using GJXDD. This data could then be used for many purposes—searching for records, validating data, and workflow, such as notices and updating change of address information on databases throughout the state."

CriMNet also recognizes the cost savings in implementing XML standards like the GJXDD. "If we have a single standard, the cost may be about $50K. If we have fifty different standards, one for each state, this type of interface will cost us $2.5 million ($50K X 50). So standards are a really good thing when you have limited budgets," said McCreary.

JNET has and continues to research, evaluate, prototype and implement state-of-the-art, leading edge technologies. The JNET Web CPIN (Commonwealth Photo Image Network) is an investigative tool for the identification of criminal subjects through existing photo imaging technology. This search application will enable JNET users to search a database of over 2,000,000 photos, scars, tattoos, and descriptive characteristics such as height, weight, age, hair color, and eye color and provide users with a candidate list of suspects with the given characteristics.

The JNET Office is currently developing two additional GJXDD-based applications: an Electronic Citation Filing Project for transferring traffic and non-traffic citations from the Pennsylvania State Police to the court system and a Sentencing Guidelines Project for transferring the guidelines from the Pennsylvania Sentencing Commission to the court system. Both projects are expected to be deployed in the first quarter of 2004. Other GJXDD-based projects planned for the future include a Warrants Project and a Criminal History Record Disposition system update.

Wireless access to JNET has been initiated to provide the justice community the critical justice data they need in the field. This will enable real time access to justice data providing Pennsylvania law enforcement officers the ability to more efficiently and effectively assess the situations they face. Although "there's not a lot of wireless access equipment in the field right now, the JNET system is ready and available," said Firestone. "JNET is a very comprehensive system with large amounts of data and high quality digital photos which needs high speed wireless coverage." As departments continue to deploy mobile data terminals (MDTs), tablet PCs, and laptops, and wireless coverage

becomes more robust and complete, access to JNET in a mobile environment will become widespread.

"The largest users of JNET are local and state police," said Firestone. JNET provides law enforcement officers with immediate access to critical criminal justice information which helps them to perform their jobs more effectively. The availability of this information has enabled officers in the field to identify and apprehend suspected individuals, solve cases faster, and keep criminals off the street.

Dear Colleague:

I am very pleased to announce that the Office of Justice Programs (OJP), together with the Global Justice Information Sharing Initiative (Global), is releasing the first operational version of the Global Justice Extensible Markup Language (XML) Data Model (GJXDM), Version 3.0, to the justice community.

What began in March 2001 as a reconciliation of data definitions evolved into a broad two-year endeavor to develop an XML-based framework that would enable the entire justice and public safety community to effectively share information at all levels? laying the foundation for local, state, and national justice interoperability.

Developed by the Global Initiative and OJP, the GJXDM is an object-oriented data model comprised of a well-defined vocabulary of approximately 2,500 stable data objects, or reusable components, that facilitate the exchange and reuse of information from multiple sources and multiple applications.

Prior to the development of the GJXDM, justice agencies generally operated within their own computer networks and database systems, resulting in a fragmented justice environment where requests for critical information took days or weeks to get to the appropriate agencies.

Since its first prerelease in April 2003, the GJXDM has undergone an intensive review and validation process that included an open public comment period, pilot validation projects, an online feedback and error-reporting mechanism, and a listserv for sharing expertise and support. As a result, three more recent prerelease versions have evolved that incorporated more than 100 modifications. Today, more than 50 law enforcement and justice-related projects have been implemented utilizing the GJXDM prerelease versions, further demonstrating the flexibility and stability of the GJXDM. One such project is Pennsylvania's Justice Network (JNET), whose online Driver History Record application successfully employs the GJXDM.

For 2004 we are planning to introduce: new training for the Data Model, a content-based search tool for the Data Model, performance testing, and an online database that will allow practitioners to post information about their applications of the GJXDM. We are excited about the upcoming developments and hope that justice professionals like you will stay engaged in the evolution of the GJXDM.

More information on the GJXDM is available at the GJXDM Web site at http://it.ojp.gov/gjxdm.

Deborah J. Daniels,
Assistant Attorney General

Dear Colleague:

I am very pleased to announce that the Office of Justice Programs together with the Global Justice Information Sharing Initiative (Global) is releasing a newly developed feature—the **Global Justice Extensible Markup Language (XML) Data Model (GJXDM) Listserv**—now available to the justice community.

The GJXDM Listserv is an electronic forum created for the purpose of developing and broadening the community of justice XML expertise and support for the application of the GJXDM and Global Justice XML Data Dictionary (GJXDD) elements. The GJXDM Listserv promotes the exchange of ideas and experiences associated with the GJXDM and GJXDD. Justice XML projects are steadily being developed and implemented throughout the country. As a result, their successes have fostered a growing community of interest.

The Listserv provides a forum for in-depth discussions on the following XML topics:

- XML literature
- research
- education, training, and conference opportunities
- hardware and software specifications and acquisitions
- proposals
- plan development
- pilot projects
- implemented programs (local, state, tribal, and national applications)

Listserv membership should include justice and public safety practitioners, managers, policymakers, developers, and programmers involved with building applications using the GJXDM, as well as private sector and local, state, tribal, and federal government communities of practice who are involved in data integration efforts using XML.

If you would like to join the GJXDM Listserv or would like more information, refer to the GJXDM Listserv Web site http://it.ojp.gov/topic.jsp?topic_id=92.

Deborah J. Daniels,
Assistant Attorney General

Acknowledgements

The ongoing task of developing and advancing the Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) is a collective enterprise in the truest sense of the term. The Office of Justice Programs (OJP) and the Global Advisory Committee (GAC) would like to acknowledge the invaluable assistance provided by:

American Association of Motor Vehicle Administrators (AAMVA)

http://www.aamva.org

Automated Regional Justice Information System (ARJIS)

http://www.arjis.org/

CriMNet

http://www.crimnet.state.mn.us

Federal Bureau of Investigation (FBI), Criminal Justice Information Services (CJIS) Division

http://www.fbi.gov/hq/cjisd/cjis.htm

Georgia Tech Research Institute (GTRI)

http://www.gtri.gatech.edu

GJXDM Training and Technical Assistance Committee (GTTAC)

http://www.it.ojp.gov/gttac

Global Infrastructure/Standards Working Group (GISWG)

http://www.it.ojp.gov/topic.jsp?topic_id=57

Global XML Structure Task Force (GXSTF)

http://www.it.ojp.gov/xstf

Integrated Justice Information Systems (IJIS) Industry Working Group (IWG)

http://iwg.ijis.org/

Integrated Justice Information Systems (IJIS) Institute

http://www.ijis.org

Joint Task Force on Rap Sheet Standardization

http://www.doj.state.wi.us/les/XML/jtf.htm

Justice Information Sharing Professionals (JISP)

http://it.ojp.gov/topic.jsp?topic_id=51

Law Enforcement Information Technology Standards Council (LEITSC)

http://www.leitsc.org/

Legal XML Court Filing Standards Initiative

http://it.ojp.gov/topic.jsp?topic_id=65

Los Angeles County Sheriff's Department

http://www.lasd.org/divisions/tsdiv/record_id/ri_ovrview.html

Mapping Alaska's Justice InterChanges (MAJIC)

http://www.dps.state.ak.us/cjiab/documents/default.asp?passParent=100&passCategory=MAJIC+Project

National Center for State Courts (NCSC)

http://www.ncsconline.org

National Telecommunications and Information Administration (NTIA)

http://www.ntia.doc.gov

NLETS – The International Justice and Public Safety Information Sharing Network

http://www.nlets.org

Pennsylvania Justice Network (JNET)

http://www.pajnet.state.pa.us

Regional Information Sharing Systems® (RISS)

http://www.iir.com/riss

SEARCH, The National Consortium for Justice Information and Statistics

http://www.search.org

U.S. Department of Homeland Security

http://www.dhs.gov/dhspublic/

Glossary of Terms and Internet Links

American Association of Motor Vehicle Administrators (AAMVA)

http://www.aamva.org
The American Association of Motor Vehicle Administrators (AAMVA) is a nonprofit organization striving to develop model programs in motor vehicle administration, police traffic services, and highway safety. AAMVA serves as an information clearinghouse for these same disciplines and acts as an international spokesperson for these interests.

Automated Regional Justice Information System (ARJIS)

http://www.arjis.org/
The Automated Regional Justice Information System (ARJIS) is a complex criminal justice enterprise network utilized by local, state, and federal agencies in the San Diego, California, region. ARJIS is chartered with supporting a regional Web-based enterprise network that utilizes technical and operational standards to build interfaces to all criminal justice systems in the region. The ARJIS secure intranet, ARJISNet, contains data on the region's crime cases, arrests, citations, field interviews, traffic accidents, fraudulent documents, photographs, gang information, and stolen property.

ARJIS is also utilized 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, location, or 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.

Criminal Justice Information Services (CJIS) Division, Federal Bureau of Investigation (FBI)

http://www.fbi.gov/hq/cjisd/cjis.htm
The Criminal Justice Information Services (CJIS) Division was established in February 1992 to serve as the focal point and central repository for criminal justice information services in the Federal Bureau of Investigation (FBI). It is the largest division within the FBI. Programs that were initially consolidated under the CJIS Division include the National Crime Information Center (NCIC), Uniform Crime Reporting (UCR), and Fingerprint Identification. In addition, responsibility for several ongoing technological initiatives was also transferred to the CJIS Division, including the Integrated Automated Fingerprint Identification System (IAFIS), NCIC 2000, and the National Incident-Based Reporting System (NIBRS).

CriMNet

http://www.crimnet.state.mn.us
CriMNet is an enterprise architecture that puts in place a statewide framework of people, processes, data, standards, and technology focused on providing accurate and comprehensive data to the criminal justice community in the state of Minnesota. It provides the means to put "the right data in the hands of the right people at the right time and in the right place."

The CriMNet integration effort is not one single project but incorporates many projects that are being developed by criminal justice organizations throughout Minnesota. The integration architecture is driven by local operational needs and uses standards that will support the exchange of data across existing and developing systems.

Georgia Tech Research Institute (GTRI)

http://www.gtri.gatech.edu
The Georgia Tech Research Institute (GTRI) is the nonprofit applied research arm of the Georgia Institute of Technology in Atlanta, Georgia. With more than 1,000 employees, GTRI supports approximately $100 million in research yearly, for more than 200 clients in industry and government. GTRI researchers have played a pivotal role in the engineering support and technical guidance of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM).

GJXDM Training and Technical Assistance Committee (GTTAC)

http://www.it.ojp.gov/gttac
The GJXDM Training and Technical Assistance Committee (GTTAC) is a consortium of organizations engaged in technical assistance and training related to technology in the justice field, specifically the Global JXDM. The GTTAC supports the development of training and technical assistance for the Global JXDM. The Committee was established in January 2004 as an outreach effort for the Global JXDM. It is related to, but external from, the Global Justice Information Sharing Initiative (Global) and is an operating entity on behalf of the Global JXDM to assist the justice community's need to better understand and implement the Global JXDM.

GTTAC's mission is to coordinate the work of national service providers in providing training and technical assistance on issues related to the implementation of the Global JXDM. Major projects include building Global JXDM Information Exchange Package Descriptions, creating a national virtual help desk centered on the Global JXDM, and coordinating regional large-scale Global JXDM training events.

Global Justice Information Sharing Initiative (Global)

http://www.it.ojp.gov/global
The Global Justice Information Sharing Initiative (Global) is a "group of groups," representing more than 30 independent organizations spanning the spectrum of law enforcement, judicial, correctional, and related bodies. Member organizations participate in Global out of shared responsibility and shared belief that together they can bring about positive changes in interorganizational communication and data sharing.

The Global Advisory Committee (GAC) serves as an advisory committee for the U.S. Department of Justice. Global aids its member organizations and the people they serve through a series of important initiatives. These include the facilitation of the Global Working Groups, development of technology standards, creation of white papers on data sharing issues, and the dissemination of information via the Global Web site.

The work of the GAC has implications of the highest importance and helps to make the GAC the foremost voice for justice information sharing.

Global Infrastructure/Standards Working Group (GISWG)

http://www.it.ojp.gov/topic.jsp?topic_id=57
Successful data exchange is greatly facilitated by the development and adoption of standards that enable transparent integration of disparate systems. The Global Justice Information Sharing Initiative (Global) Infrastructure/Standards Working Group (GISWG) is implementing a coordination process to identify information sharing standards within the justice community. This effort includes publishing, cataloging, and sharing these standards to promote collaborative efforts and offer blueprints to those beginning the information exchange planning process.

Global XML Structure Task Force (GXSTF)

http://www.it.ojp.gov/xstf
The Global Extensible Markup Language (XML) Structure Task Force (GXSTF) is a component of the Global Justice Information Sharing Initiative (Global) Infrastructure/Standards Working Group (GISWG).

The GXSTF addresses the requirements, design, structure, and implementation for the Global Justice XML Data Model (Global JXDM). Their vision is to significantly advance justice information sharing by providing a common language and vocabulary that reduces cost and technical barriers. More specifically, the GXSTF has developed a consistent, extendable, maintainable XML schema reference specification for data elements and types that represent the data requirements of the general justice and public safety communities. The GXSTF is heavily involved in the Global JXDM release process and approves all fixes, additions, deletions, and modifications to each implementation. The GXSTF is also responsible for Global JXDM guidance, review, and issue resolution.

Institute for Telecommunication Sciences (ITS)

http://its.bldrdoc.gov/
The National Telecommunications and Information Administration (NTIA), an agency of the U.S. Department of Commerce, is the Executive Branch's principal voice on domestic and international telecommunications and information technology issues. NTIA works to spur innovation, encourage competition, help create jobs, and provide consumers with more choices and better quality telecommunications products and services at lower prices.

The Institute for Telecommunication Sciences (ITS) is the chief research and engineering arm of NTIA. ITS supports NTIA telecommunications objectives such as promotion of advanced telecommunications and information infrastructure development in the United States, enhancement of domestic competitiveness, improvement of foreign trade opportunities for U.S. telecommunications firms, and facilitation of more efficient and effective use of the radio spectrum.

ITS also serves as a principal federal resource for solving the telecommunications concerns of other federal agencies, local and state governments, private corporations and associations, and international organizations.

Integrated Justice Information Systems (IJIS) Industry Working Group (IWG)

http://iwg.ijis.org/
The mission of the Industry Working Group (IWG) is to contribute to the implementation of Integrated Justice Information Systems (IJIS) throughout the country by applying the knowledge and experience of the information technology (IT) industry. As IT professionals responsible for the achievement of solution systems, IWG believes that experience and perspective will improve the quality and reduce the time to market for solutions. The IWG supports the initiative of the Office of Justice Programs to involve industry in its IJIS program and believes that the program will benefit from its unique and collective experience.

International Organization for Standardization (ISO)

http://www.iso.org
The International Organization for Standardization (ISO) is a network of national standards institutes from 145 countries working in partnership with international organizations, governments, industry, business, and consumer representatives.

Joint Task Force on Rap Sheet Standardization

http://www.doj.state.wi.us/les/XML/jtf.htm
The Joint Task Force (JTF) on Rap Sheet Standardization is an endeavor by the Federal Bureau of Investigation (FBI) and NLETS – The International Justice and Public Safety Information Sharing Network to bring about a national standard for the exchange of criminal history rap sheets. Sponsored by the FBI, members include staff of the FBI, NLETS, and states that operate criminal history repositories.

In 1995, the National Task Force on Increasing the Utility of the Criminal History Record recommended expanded data content, a presentation format (page layout) for the expanded content, and the creation of a transmission format for the interstate sharing of criminal history information. The National Task Force included representatives from the FBI Criminal Justice Information Services (CJIS) Advisory Policy Board (APB); NLETS; the National Center for State Courts; and SEARCH, The National Consortium for Justice Information and Statistics. Its members were a diverse array of justice practitioners drawn from the judiciary; prosecution; court administration; local, state, and federal law enforcement; juvenile justice pretrial services; and state criminal records repositories.

Justice Information Exchange Model (JIEM)

http://www.search.org/programs/technology/jiem.asp
The Justice Information Exchange Model (JIEM) consists of a framework that defines universal dimensions of information exchange, a research and planning methodology for modeling the operational dynamics of this information exchange, and a Web-based software application—the JIEM Modeling Tool—that enables data collection, analysis, and reporting by users and researchers.

Justice Information Sharing Professionals (JISP)

http://it.ojp.gov/topic.jsp?topic_id=51
The Justice Information Sharing Professionals (JISP) is a national network of local and state justice and public safety integrators responsible for the facilitation, collaboration, and advocacy of information sharing. JISP was created to focus on the need to enhance communication among practitioners. JISP coordinates a member-only Internet mail list at http://groups.yahoo.com/group/JISP/.

Law Enforcement Information Technology Standards Council (LEITSC) Technology Center

http://www.leitsc.org/
The Law Enforcement Information Technology Standards Council (LEITSC) is funded through the Office of Justice Programs (OJP), U.S. Department of Justice, to address the issue of information technology standards specific to the law enforcement community. The mission of LEITSC is to foster the growth of strategic planning and implementation of integrated justice systems by promoting the merits of information technology (IT) standards, providing advice to the nation's law enforcement community on technical aspects of IT standards, sharing practical solutions, and representing the voice of law enforcement in the expansion of justice and public safety IT standards.

LEITSC partners include the International Association of Chiefs of Police (IACP), the Police Executive Research Forum (PERF), the National Sheriffs' Association (NSA), and the National Organization of Black Law Enforcement Executives (NOBLE).

LegalXML Court Filing Standard Initiative

http://it.ojp.gov/topic.jsp?topic_id=65
Pursuant to discussions at an August 1999 planning meeting, the Conference of State Court Administrators/National Association of Court Managers Joint Technology Committee (JTC) formed an e-filing standards subcommittee to pursue an Internet electronic filing specification for the courts.

To that end, in December 1999, the JTC voted to partner with LegalXML, a nonprofit organization that facilitates development of XML standards for application within the legal community. This coalition produced the LegalXML Court Filing Standard.

Mapping Alaska's Justice InterChanges (MAJIC)

http://www.dps.state.ak.us/cjiab/documents/default.asp?passParent=100&passCategory=MAJIC+Project
The Mapping Alaska's Justice InterChanges (MAJIC) program, managed by the state's Criminal Justice Information Advisory Board, brings together the systems in many organizations statewide, including the Department of Public Safety, the Alaska Court System, the Public Defender Agency, and the National Law Enforcement and Corrections Technology Center-Northwest.

National Center for State Courts (NCSC)

http://www.ncsconline.org
The National Center for State Courts (NCSC) provides up-to-date information and hands-on assistance that help court administrators to better serve the public. Through original research, consulting services, publications, and national educational programs, NCSC offers solutions that enhance court operations with the latest technology, collects and interprets the latest data on court operations nationwide, and provides information on proven "best practices" for improving court operations in areas such as civil case management.

National Crime Information Center (NCIC)

http://www.fas.org/irp/agency/doj/fbi/is/ncic.htm
The National Crime Information Center (NCIC) is a computerized index of criminal justice information (i.e., criminal record history information, fugitives, stolen properties, and missing persons). It is available to local, state, and federal law enforcement and other criminal justice agencies and is operational 24 hours per day, 365 days per year. The purpose for maintaining the NCIC system is to provide a computerized database for ready access by a criminal justice agency making an inquiry and to provide prompt disclosure of information in the system from other criminal justice agencies. This information assists authorized agencies in criminal justice and related law enforcement objectives, such as apprehending fugitives, locating missing persons, and locating and returning stolen property, as well as protecting law enforcement officers.

National Incident-Based Reporting System (NIBRS)

http://www.ojp.usdoj.gov/bjs/nibrs.htm
The Federal Bureau of Investigation's (FBI) Uniform Crime Reporting (UCR) Program, which began in 1929, collects information about crimes reported to the police. In 1982, the Bureau of Justice Statistics and the FBI sponsored a study of the UCR Program, with the objective of revising it to meet law enforcement needs into the twenty-first century. A five-year redesign effort to provide more comprehensive and detailed crime statistics resulted in the National Incident-Based Reporting System (NIBRS), which collects data on each reported crime incident. The UCR Program is currently being expanded to NIBRS.

National Institute of Justice (NIJ)

http://www.ojp.usdoj.gov/nij
The National Institute of Justice (NIJ) is the research, development, and evaluation agency of the U.S. Department of Justice. NIJ provides objective, independent, nonpartisan, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the state and local levels. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 USC * 3721-3723).

The NIJ director is appointed by the President and confirmed by the Senate. The NIJ director establishes the Institute's objectives, guided by the priorities of the Office of Justice Programs, the U.S. Department of Justice, and the needs of the field. NIJ actively solicits the views of criminal justice and other professionals and researchers to inform its search for the knowledge and tools to guide policy and practice.

National Telecommunications and Information Administration (NTIA)

http://www.ntia.doc.gov
The National Telecommunications and Information Administration (NTIA), an agency of the U.S. Department of Commerce, is the Executive Branch's principal voice on domestic and international telecommunications and information technology issues. NTIA works to spur innovation, encourage competition, help create jobs, and provide consumers with more choices and better quality telecommunications products and services at lower prices.

NLETS – The International Justice and Public Safety Information Sharing Network

http://www.nlets.org
The mission of NLETS – The International Justice and Public Safety Information Sharing Network is to provide, within a secure environment, an international criminal justice telecommunication capability that will benefit, to the highest degree, the safety, security, and preservation of human life and the protection of property. NLETS will assist those national and international governmental agencies and other organizations with similar missions who enforce or aid in enforcing local, state, federal, or international laws or ordinances.

Pennsylvania Justice Network (JNET)

http://www.pajnet.state.pa.us
JNET is a collaboration of municipal, county, state, bordering states, and federal justice agencies that develop and provide a secure, online integrated justice system that allows participating agencies to access driver and offender records and other justice information. Local and state police officers, JNET's largest users, have immediate access to critical criminal justice information that helps them to perform their jobs more effectively.

Regional Information Sharing Systems® (RISS)

http://www.iir.com/riss
The Regional Information Sharing Systems (RISS) Program is composed of six regional centers that share intelligence and coordinate efforts against criminal networks that operate in many locations across jurisdictional lines. Typical targets of RISS activities are drug trafficking, terrorism, violent crime, cybercrime, gang activity, and organized criminal activities. Each of the centers, however, selects its own target crimes and the range of services provided to member agencies.

SEARCH, The National Consortium for Justice Information and Statistics

http://www.search.org
SEARCH, The National Consortium for Justice Information and Statistics is a nonprofit membership organization created by and for the states, 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 justice information law and policy.

Vision and Purpose

Vision

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) vision is to significantly advance justice information sharing by providing a common language and vocabulary that reduce cost and technical barriers.

Purpose

The purpose of the Global JXDM is to provide a consistent, extensible, and maintainable XML schema reference specification for data elements and types that represent the data requirements of the general justice and public safety communities.

A long-term goal is to provide a baseline model for the data dictionary that can be represented in advanced technologies beyond XML schema.

Global JXDM Versus Global JXDD

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) is an object-oriented data model that specifies a representative structure for the Global Justice XML Data Dictionary (Global JXDD). The Global JXDM (**structure**) and the Global JXDD (**semantics**) are integrated and implemented as a relational database. This database is used to generate a consistent representation in XML schema. For information on the Global JXDM components and schemas, refer to Global JXDM Components and Reference Architecture.

For an overview of the intent, benefits, design concepts, goals, components, and current reference notes of the Global JXDM, refer to the discussion topics under this heading.

Components and Reference Architecture

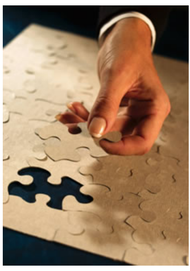
- Components
- Reference Architecture
- Related Information

Components

The basic concept of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) is to provide a base set of information "components" that can be reused and extended to meet the requirements of information exchanges across the justice community. The following terms outline the basic components used to describe exchangeable data elements and the constructs used for tagging data and rendering components.

Types and Properties

The Global JXDM is an infrastructure for representing and managing data entities and their relationships independently of XML. These entities and their relationships are defined precisely by using two kinds of components: **types** and **properties**. An understanding of the concept of types and properties is critical to understanding the Global JXDM. For more information, refer to Introduction to Properties.



Type
A type is a structure that carries values associated with a real-world entity.

Property
A property associates specific characteristics or values of things with an instance of type. Every property in the data dictionary has been given a definition. This definition outlines how the property is to be used and what it means.

There are three components to a property:

- Property name – a unique label applied to the property. Property names are unique within the data dictionary.
- Subject type – the type to which the property applies. For example, in the case of a person's name, the property would be "Name" and the subject type would be "PersonType."
- Object type – the type of the value of the property. For example, if a name is a string, then the object type of the property "Name" would be "StringType."

Properties are represented as XML schema **attributes** and **elements**.

XML Types

Global JXDM types are rendered as XML types.

XML Attributes and Elements

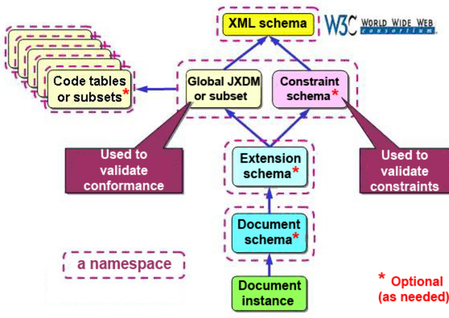
XML schema provides two constructs for tagging data in XML instances: **attributes** and **elements**. Properties can be represented by either construct. Most of the Global JXDM properties are rendered as elements because elements are less restrictive than attributes. There are cases where rendering properties as attributes is necessary or justified. For the rendering rules for properties, refer to Rendering Global JXDM Properties as XML Schema Elements Versus Attributes.

Reference Architecture

In order to facilitate information exchange, the Global JXDM is represented as a set of XML schemas. The reference architecture is a framework to organize these schemas together with user-defined schemas and instances. The reference architecture includes:

- A Global JXDM schema subset (or the full schema)
- Optional external schema subsets (of code tables)
- An optional constraint schema
- An optional extension schema
- An optional document schema
- A document instance (the XML file that carries the data values)

The following diagram illustrates the reference architecture and how these documents are related.



Reference Architecture

Global JXDM Schemas

The Global JXDM schema is a list of commonly used data elements that were compiled from actual data requirement sources and narrowed down and refined to result in a set of precise and well-defined data components. The Global JXDM schema is one functional representation of those components and the product of the Global JXDM specification that application developers use for programming. The Global JXDM is also dependent on schemas that represent code tables taken from specifications and publications created by other groups and organizations. The Global JXDM base schema references these code tables by importing **external schemas** in an effort to maintain the independence of the various specifications. For more information on documented and undocumented full schemas for the current and future Global JXDM releases, refer to http://www.it.ojp.gov/jxdm.

Customized Schema Subsets

Since the full justice schema and all of its imports are optional and over-inclusive, users have the ability to retrieve only those components from the data dictionary that they need. Many users will not want every element to be able to occur repeatedly. Furthermore, it is unlikely that a user will need to use the entire contents of the full schema. This is the basic idea behind schema subsets—to provide smaller schemas that define only those components from the dictionary that the user wants to include. The full Global JXDM schema can be used, but it is not necessary to do so. Smaller schema subsets can be more manageable than the full schema and will usually permit more rapid validation of **document instances**. The overriding rule for using Global JXDM schema subsets is as follows:

Document instances that validate to the schema subset will validate to the full Global JXDM schema.

Constraint Schema

The Global JXDM schema represents a reference model that is intentionally optional and over-inclusive. The purpose of the reference model is to focus structure and semantics through well-defined types and properties, not to dictate which components to use or how to fine-
tune their content. However, practical exchanges of actual XML instances usually require much tighter constraints on elements and attributes than the schema representing the reference model allows. In a constraint schema, the user can restrict element occurrences and employ facets. An instance must pass both the conformance validation path and the constraint validation path. Conformance validation ensures proper use of the Global JXDM, and constraint validation (more restrictive) confirms that an instance adheres to rules specific to the user's application. In many cases (though not a requirement), a constraint schema will be a copy of the Global JXDM schema subset (or full) with appropriate constraints applied.

Document Schema and Local Extensions

Optional **document schemas** and local **extension schemas** are user-defined. For information exchanges of large, formal documents (such as an Arrest Warrant or Incident Report), an XML document schema that derives its root element from the DocumentType component in the Global JXDM should be used. This enables the root type to inherit and use all of the document metadata properties defined in DocumentType. Smaller transactions (e.g., small update transactions) may not require the DocumentType metadata and may not even require a document schema. In these cases, the user may choose not to derive the root element type from DocumentType. Extension schemas may contain user-defined components extended from appropriate Global JXDM types. When these extensions are used by other document schemas, it may be more efficient to put them into their own namespace (refer to the above illustration); however, this is not required.

Related Information

For specific information on the most current Global JXDM types and properties, schemas, proxy schemas, and more, refer to http://it.ojp.gov/jxdm. For information on the most current Global JXDM version, updates, and related products, refer to the OJP Information Technology Web site at http://www.it.ojp.gov/gjxdm.

For further questions regarding how the Global JXDM was structured, its components, codes, literals, elements, relationships, and more, refer to Frequently Asked Questions.

For detailed information on schema subsets, refer to Customized Schema Subsets.

For a list of rules under which users may construct schemas that are subsets of the full Global JXDM schema, refer to Rules for Schema Subsets.

For a particular user need, the Global JXDM schema subset and the external schema subsets can be built and automatically assembled using the Global JXDM Schema Subset Generation Tool (SSGT).

Advantages

The following are particular advantages of implementing the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM):

Standards-based— It adopts several XML and data standards.

Model-based— It generates consistent XML schema.

Requirements-based— It is built from existing data models, dictionaries, processes, and document specifications.

Object-oriented— It can be efficiently extended and reused (inheritance).

Extendable— It enables local additions of data components.

Expandable— Its domain includes courts, law enforcement, corrections, juvenile, and intelligence communities.

Provides relationships— For rich exchange information context.

Built to evolve/advance— With emerging technologies.

Design Criteria and Goals

- Design Criteria
- Design Criteria Goals

Design Criteria

The following design criteria were applied in the development of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM):

- Design a common set of reusable, extendable XML data components for the Global Justice XML Data Dictionary (Global JXDD) that facilitates standard information exchange.
- The Global JXDM will be overinclusive and optional.
- Requirements, solutions, and time constraints will be established from rational compromises.
- The International Organization for Standardization (ISO) 11179 – Specification and Standardization of Data Elements will be used, as well as other applicable standards.
- The Global JXDD will evolve, facilitating change and extension.
- Extension methods should minimize impact on prior schema and code investments.
- Domain relationships will be implemented and represented so that they are globally understood.
- Develop reference architecture and namespaces for a standard Global JXDD schema specification.
- The Global JXDM will be an object-oriented model using named types and extensions.
- Value constraints will be enabled: codes/enumerations and special semantics.
- Primary (IS-A, HAS-A) and secondary (domain) relationships will be utilized.
- The Global JXDM will be built from functional requirements, reference documents, use cases, business context components, and containers.
- The Global JXDM will provide migration paths for evolving to new technologies.

Design Criteria Goals

The design criteria discussed above were developed in accordance with the following goals:

- To enable forms-based maintenance/reconfiguration of the Global JXDM.
- To automatically generate XML schema for the Global JXDD schema specification.
- To automatically generate equivalent Resource Description Framework (RDF) schema.
- To store and map data element requirements from any data source (schema, Document Type Definition [DTD], data table, or data dictionary) to Global JXDM components.
- To enable measurement by source of the number of data requirements covered and the number of data left to implement.
- To provide search filters, forms, and tools to quickly analyze data requirements and build initial draft object models for vetting.

Design Assumptions

When considering the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM), the government and industry experts, technical managers, and engineers responsible for its development formed the following assumptions that guided them in their design of the Global JXDM.

The Global JXDM will:

- Be reusable, with extensible data components that facilitate standard information exchange in XML within the justice, courts, public safety, and homeland security communities.
- Generalize for the community at large, rather than specific document instances.
- Provide referenceable schema components for schema developers.
- Have a Global JXDD and Global Justice XML Data Dictionary Schema (JXDDS) that will evolve, change, and require extensions, using extension methods that minimize the impact on prior investments.
- Represent and implement domain relationships.
- Have time, technical, and requirement constraints that mandate rational trade-offs—no silver bullets!

Evolution of Global Justice XML

The Global Justice Information Sharing Initiative (Global) Justice Extensible Markup Language (XML) Data Model (Global JXDM) is the result of a collaborative effort of numerous agencies from all levels of the justice and public safety domains. The project was sponsored by the Office of Justice Programs (OJP), U.S. Department of Justice, with advice from the Global Advisory Committee (GAC) and coordination by the Global XML Structure Task Force (GXSTF)—an advisory team under the GAC's Global Infrastructure/Standards Working Group (GISWG). The GXSTF consists of government and industry domain experts, technical managers, and engineers who identified data requirements, explored XML concepts, and applied XML best practices to the design and implementation of the Global JXDM. Technical development support was provided by Georgia Tech Research Institute (GTRI), which played a key role in developing the software foundations for the Global JXDM. GTRI worked with the GXSTF to create a comprehensive product that included a data model, a data dictionary, and an XML schema which together became known as the Global JXDM.

The Global JXDM endeavor began in March 2001 as a reconciliation of data definitions and evolved into a broad two-year effort to develop an XML-based framework that would enable the entire justice and public safety communities to effectively share information at all levels—laying the foundation for local, state, tribal, and national justice interoperability.

Approximately 16,000 justice and public safety-related data elements were collected from various local and state government sources. These were analyzed and reduced to around 2,000 unique data elements that were then incorporated into about 300 data objects, or reusable components, resulting in the Global Justice XML Data Dictionary (Global JXDD). The Global JXDD components have inherent qualities enabling access from multiple sources and reuse in multiple applications. In addition, the standardization of the core components resulted in significant potential for increased interoperability among and between justice and public safety information systems.

Since its first prerelease in April 2003, the Global JXDM (including the Global JXDD) has undergone an intensive review and validation process that included an open public comment period, pilot validation projects, an online feedback and error-reporting mechanism (Bugzilla Feedback), and the Global JXDM Listserv—a forum for sharing expertise and support. As a result, three prerelease versions that incorporated more than 100 modifications evolved into the operational version that is available today. Today, more than 50 law enforcement and justice-related projects have been implemented utilizing the Global JXDM, further demonstrating the flexibility and stability of the Global JXDM.

Refer to Historical Documents for a listing of documents pertaining to the development and growth of the Global JXDM.

Historical Documents

- General Development
- Summaries and Fact Sheets
- Technical

The following is a resourceful list of documents that provide historical development, overview, and technical information on the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and the Global Justice XML Data Dictionary (Global JXDD). Refer to Evolution of Global Justice XML for a brief history of the development of the Global JXDM.

General Development

1. The Development of Global JXDD, Version 3.0
2. Global Justice XML Data Dictionary Schema Development Flowchart

Summaries and Fact Sheets

1. Extensible Markup Language (XML) and Its Role in Supporting the Justice Data Model
2. The Justice XML Data Model Overview and Status
3. Global Justice XML Data Model Executive Overview
4. XML in Justice Information Sharing: An Executive Summary
5. What's in Global JXDD 3.0 for Me?
6. Lessons Learned in Reconciling Three Justice XML Development Efforts

Technical

1. Justice and Public Safety XML Data Element Definitions
2. Structure and Design Issues for Developing, Implementing, and Maintaining a Global Justice XML Data Dictionary
3. Justice XML Data Model Technical Overview
4. Interstate Criminal History Transmission Specification—XML, Version 2.21

Global Justice XML Data Model

Executive Overview

revised 08/04

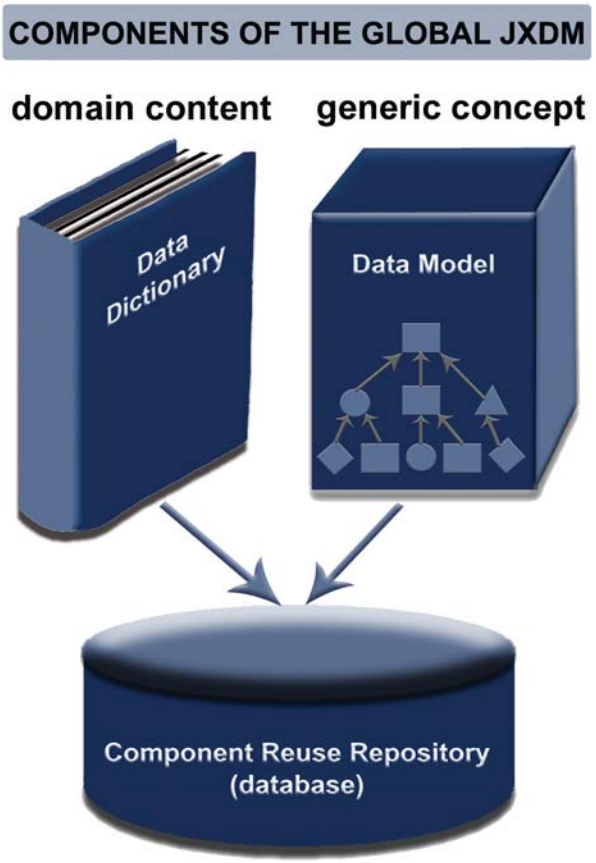
A strategic goal of the Office of Justice Programs (OJP) and the Global Justice Information Sharing Initiative (Global) is to help justice leaders and practitioners increase information sharing across the justice and public safety communities—at all levels of government—to improve public safety for America's citizens and to increase our homeland security.

The best way to accomplish this is to improve the effectiveness of justice and public safety functions by applying information technologies to facilitate the exchange of information. Extensible Markup Language (XML) is a technology created for this purpose.

XML is generally recognized as an enabler for increasing the sharing of information and has emerged as a key technology for assisting commercial and government organizations in exchanging information and conducting business over the Internet and intranets. XML is the "glue" that promotes interoperability—it allows systems being developed to communicate with each other and paves the way for future expanded collaboration between agencies.

For the past three years, OJP—with advice from Global and support from the U.S. Department of Commerce, National Telecommunications and Information Administration (NTIA), and the Georgia Tech Research Institute (GTRI)—has collected justice and public safety information requirements from various local and state governmental sources. To date, approximately 16,000 data elements have been collected from 30 unique local and state governmental sources to develop the Global Justice XML Data Model (Global JXDM). These data elements were analyzed and integrated to produce 2,750 reusable components (550 types and 2,200 properties) that have inherent qualities enabling access from multiple sources and reuse in multiple applications. The vision was to significantly advance justice information sharing by providing a common language and vocabulary that reduce costs and technical barriers through the analysis of functional requirements. In addition, the standardization of the core components results in significant potential for increased interoperability among and between justice and public safety information systems.

There are three primary components to the Global JXDM:



the data dictionary (identifying content and meaning), the data model (defining structure and organization), and the component reuse repository (database). The Global JXDM, Version 3.0, and other supporting tools and resources were developed to facilitate implementation by system developers and users, and the most current resources are posted on the OJP Information Technology Initiatives Web site.

Since its creation, more than 50 law enforcement and justice-related projects have been implemented using the Global JXDM, and hundreds of users and developers have received training. As it continues to evolve, the Global JXDM will remove the burden from agencies to independently create document and exchange standards, while achieving enhanced interoperability and broadscale endorsement by justice practitioners.

For the latest information, visit
www.it.ojp.gov/gjxdm

Examples

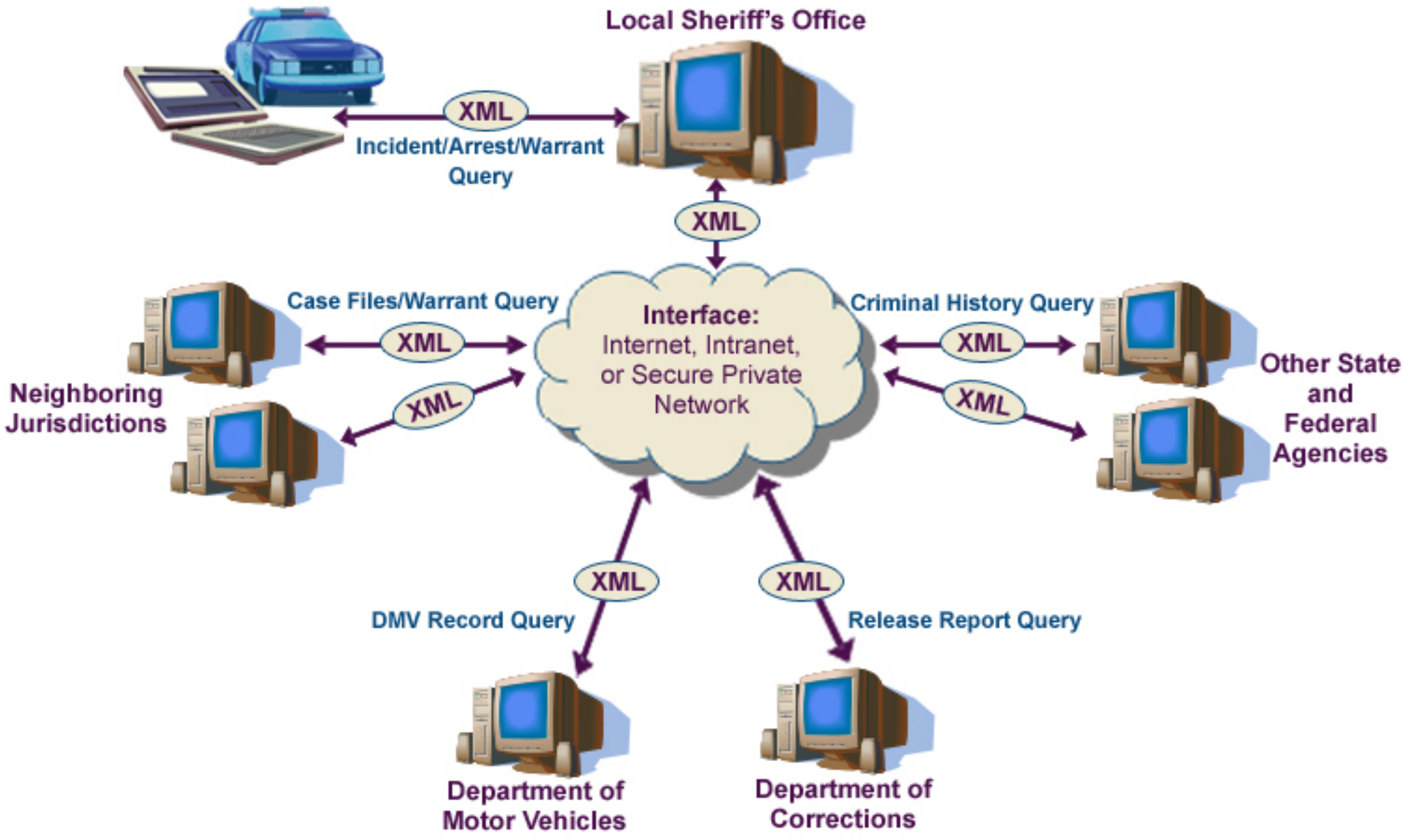
Global JXDM Presentation Scenario

In the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) Presentation Scenario, a police officer is depicted conducting a routine traffic stop for a speeding infraction. Using a Mobile Data Computer (MDC), the officer initiated an identification, driver history, and warrant search on the driver. The search request transmission, as well as the results returned, used XML-formatted data packets and search parameters to query information from the local sheriff's office and simultaneously query neighboring jurisdictions, the Department of Motor Vehicles, the Department of Corrections, and other state and federal agencies, such as the Sexual Offender Registry. Refer to the XML Query Schematic, below.

The officer's computer system and the agencies it queried used XML, a common vocabulary that is understood system to system and that allows agencies to exchange data, regardless of computer system or platform. This cross-platform justice information exchange resulted in the officer rapidly receiving the critical criminal justice information he needed to make an immediate arrest.

The use of the Global JXDM enables access from multiple sources and reuse in multiple applications, allowing the entire justice and public safety community to effectively exchange information at all levels.

The Pennsylvania Justice Network (JNET) has implemented a driver history application that utilizes the Global JXDM similarly to the scenario described above. For more information on the JNET implementation and others, refer to Implementations.



Implementations

- Pennsylvania Justice Network (JNET) – Driver History Record Tool
- Mapping Alaska's Justice InterChanges (MAJIC)
- AMBER Alerts and NLETS – The International Justice and Public Safety Information Sharing Network

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Pennsylvania Justice Network (JNET) - Driver History Record Tool

Pennsylvania's Justice Network (JNET) innovatively utilized the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) to deploy an online Driver History Record Tool, a cooperative effort between JNET and the Pennsylvania Department of Transportation (PennDOT).

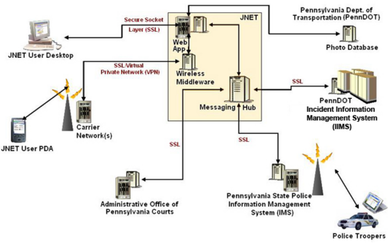
JNET is a collaboration of municipal, county, state, bordering states, and federal justice agencies that develop and provide a secure, online integrated justice system which allows participating agencies to access driver and offender records and other justice information. Local and state police officers, JNET's largest users, have immediate access to critical criminal justice information that helps them to perform their jobs more effectively.

With the Driver History Record Tool, users can directly obtain digital Pennsylvania Department of Transportation (PennDOT) driver's license photographs and demographic information. Based on the user's role, JNET users can access digital photos and signatures, address information, and driver's records simultaneously.

In developing the Driver History Record Tool, JNET extracted about 80 percent of the Global Justice XML Data Dictionary (Global JXDD) data elements and extended the remaining 20 percent to meet JNET project requirements. In using XML to establish internal messaging standards, JNET avoided traditional "turf issues" by leveraging agencies' existing computer and database systems, thus ensuring agency independence and control over their data. Refer to the JNET Driver History Infrastructure schematic, below.

To read the full article, refer to Pennsylvania's JNET Crafts a Robust Online Driver History Record Tool Using Global Justice XML, or to view a slideshow presentation of the JNET Driver History Record implementation, refer to JNET Driver History Global JXDD Model Validation. For a listing of other JNET projects implementing the Global JXDM and JNET contact information, refer to the Organizations Utilizing the Global JXDM.

JNET Driver History Infrastructure



Mapping Alaska's Justice InterChanges (MAJIC)

In July 2002, the state of Alaska organized a team of criminal justice personnel from the Alaska Court System, Department of Public Safety (DPS), Anchorage Municipal Prosecutor's Office, Public Defender Agency, University of Alaska Justice Statistical Analysis Center, and the National Law Enforcement and Corrections Technology Center–Northwest (NLECT-NW) to look at how to best achieve interagency information exchanges. The team submitted a charter to the Criminal Justice Information Advisory Board (CJIAB) and obtained approval for the Mapping Alaska's Justice InterChanges (MAJIC) project.

The MAJIC team chose SEARCH, The National Consortium for Justice Information and Statistics' Justice Information Exchange Modeling (JIEM) Tool for mapping the interagency exchanges. SEARCH staff provided free ongoing technical assistance throughout the project.

After mapping 36 exchanges, the team decided, rather than continuing to map hundreds of potential exchanges, to instead choose just one as a "proof of concept" pilot—the Notice of Appointment of Counsel. Refer to MAJIC's Notice of Appointment of Counsel schematic, below.

The NLECTC-NW, a program of the National Institute of Justice, provided free training and team facilitation and suggested that the team consider a "proof of concept" pilot exchange.

MAJIC implemented the XML-based Notice of Appointment of Counsel exchange between the Alaska Court System (ACS) and Alaska Public Defender (PD). XAware, Inc., an XML integration vendor with expertise in JIEM modeling, building schemas, and implementing exchanges using Web services and XML, worked with MAJIC to create an XML document containing the data elements to be exchanged. Creating the XML document took just three days.

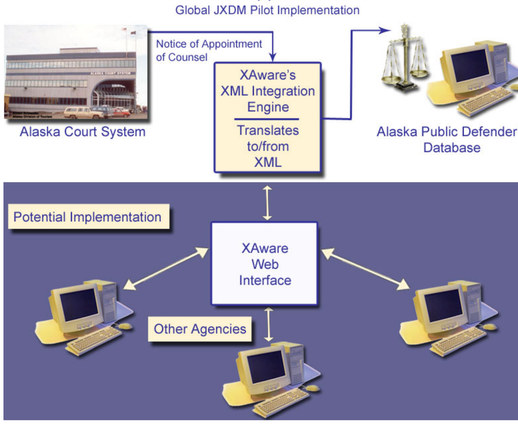
MAJIC team members, SEARCH staff, and XAware specialists reviewed each data element, field by field, to determine what data would be needed for the exchange. The group compared the definition and purpose of each data element with its corresponding Justice XML data element—normalizing the data elements by going through each element's definition to make sure the correct data element is being used.

Once the team documented the exchange using JIEM, decided which data elements to use, and defined each data element, the work moved to actual implementation, using XAware's XML integration environment. XAware technical staff took the list of normalized data elements created by the Alaska team and created Justice XML-compliant tags. Data elements were then collected into an XML "view" or XML document. Using Web services, XAware's tool set shared information between the ACS' CourtView® application and the Public Defender's Microsoft® Access 97 database.

The standards created by the Global Justice XML Data Model allow agencies to exchange information in a platform-, application-, and vendor-neutral environment. Not only was the data exchanged between different agency applications, it occurred across different networks.

To read the full article, refer to Using XML for Alaska Criminal Justice Data Exchange or refer to the MAJIC Project for more information.

Alaska's Notice of Appointment of Counsel
Global JXDM Pilot Implementation



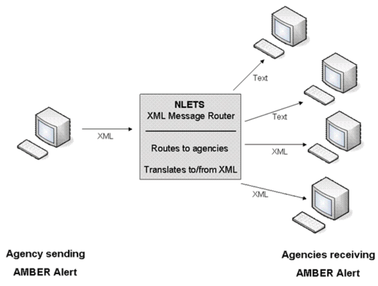
AMBER Alerts and NLETS – The International Justice and Public Safety Information Sharing Network

NLETS – The International Justice and Public Safety Information Sharing Network was created by the principal law enforcement agencies of the states nearly 40 years ago. Since the founding, NLETS' role has evolved from being primarily an interstate telecommunications service for law enforcement to a more broad-based network servicing the justice and public safety community at the local, state, and federal levels. It is now the preeminent interstate law enforcement network in the nation for the exchange of law enforcement and related justice information.

Among the many types of transactions passing through NLETS for dissemination to law enforcement and public safety-related agencies is the AMBER Alert. In November of 2004, a workshop was held to produce a new version of the national reference schema for AMBER Alerts based upon the Global Justice XML Data Model (Global JXDM). NLETS has implemented this new standard into its message specifications and is positioned to begin transmitting AMBER Alerts based upon these specifications.

In order to quickly implement this standard, NLETS created an XML specification by importing the new AMBER Alert definition into its standard messaging envelope. NLETS has solicited feedback from its members, recognizing the possibility that additional elements could be desired by its members and added within NLETS' namespace, if necessary.

Upon receipt of an XML AMBER Alert from an agency, the NLETS XML Message Router (XMR) will disseminate an AMBER Alert to all recipients. Recipients positioned to receive XML will receive the AMBER Alert XML within an NLETS envelope, identical to what the originating agency sent. For those recipients not yet positioned to receive XML, NLETS will apply an XML Stylesheet to the XML in order to create a text version.



Global JXDM Supporting Resources

- Component Definitions and Examples
- Requirements and Guides
- Specifications

The following supporting resources will contribute to the user's understanding of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and provide references to specific technical information and guidelines necessary for practical Global JXDM implementation. Links are provided to current technical documentation covering topics such as component definitions and examples, requirements and guides, and specifications.

Component Definitions and Examples

1. Introduction to Properties
2. Rendering Global JXDM Properties as XML Schema Elements Versus Attributes
3. Extension Methods
4. Customized Schema Subsets
5. Examples
6. Representing Relationships in Global JXDM

Requirements and Guides

1. Global JXDM Implementation Guidelines
2. Rules for Schema Subsets
3. Federal XML Developer's Guide (Draft)
4. Global JXDM Query Options (Draft)

Specifications

1. Global JXDM Class Hierarchy
2. NIBRS Mapping to Global Justice XML Data Model
3. Reference Architecture
4. Justice Information Exchange Model (JIEM)

Additional XML Resources

The following links provide additional information regarding Extensible Markup Language (XML) technology.

1. W3C – XML Schema
2. W3C – XML Schema Part 0: Primer
3. W3C – XML Schema Part 1: Structures
4. W3C – XML Schema Part 2: Datatypes
5. W3C – Resource Description Framework (RDF)
6. W3C – RDF Primer
7. Stanford University Database Group – Simplified Syntax for RDF
8. Stanford University Database Group – Bridging the Gap Between RDF and XML
9. The XML FAQ
10. Cover Pages – XML Schemas
11. XML.com: XML From the Inside Out
12. XML.gov
13. XML.org