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Justice XML Data Dictionary Version 3.0.0.0 Prerelease

# Justice XML Data Model

ETS TECHNOLOGY REVIEW

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Points of Contact	<a href="#">Stan Jenkins</a> <a href="#">Chris Houghland</a>		

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Office of Enterprise Technology Strategies  
PO Box 17209  
Raleigh, North Carolina 27619-7209  
Telephone (919) 981-5510  
E-mail: ets@ncmail.net

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# Justice XML Data Model

*An initiative that “strives to provide consistent, extensible, maintainable, XML Schema reference specifications for data elements for the justice and public safety communities” – Gerry Wethington, President of NASCIO.*

The National Association of State Chief Information Officers (NASCIO) has requested input from the State CIO for the State of North Carolina, George Bakolia, regarding the latest version of the Justice XML Data Model, which is ostensibly defined via the Justice XML Data Dictionary and supporting Justice XML schemas. In response to this request, the Enterprise Technology Strategies (ETS) Office has reviewed the body of materials provided, obtained valuable input from CJIN agencies <sup>1</sup>, and summarized its analysis in the remainder of this document. Content includes background information, clarifications of concepts and terms, ETS and CJIN agency findings, questions concerning the model for future consideration, and ETS recommendations for the State of North Carolina.

The information contained in this technology review is intended to provide the State with guidance and direction concerning the use of Justice XML Data Model as work with in this area continues to progress.

## Background

The Justice XML Data Model is an object-oriented data structure developed to represent information in the justice and public safety communities.

The Justice XML Data Dictionary (JXDD) Version 3.0 Prerelease uses XML based technologies and constructs to uniquely identify data elements as well as the basic organizational structure of those elements within the context of justice and public safety. The current version was developed in August 2002, by the XML Structure Task Force (XSTF), which was formed by the Global Justice Information Sharing Initiative (Global) Infrastructure/Standards Working Group (GISWG) XML Committee. The XSTF is a working group composed of government and industry

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<sup>1</sup>NC Administrative Office of the Courts  
NC Department of Crime Control and Public Safety (NC State Highway Patrol)  
NC Department of Correction  
NC Department of Justice  
NC Department of Juvenile Justice and Delinquency Prevention

domain experts (from law enforcement, courts, and corrections), technical managers, and engineers.

The JXDD has evolved over time to meet the needs of a converging industry. The original initiative, defined as the Reconciled Data Dictionary (RDD) Version 1.0. The RDD contained approximately 300 standard terms for data elements, which was the result of initial data reconciliation from a small number of federal agencies and other representative groups. As other associations and organizations looked toward developing applications using the RDD, it was determined that the dictionary was useful, but insufficient.

In order to meet the goals of agencies by providing a consistent, extensible, and maintainable element list for the justice and public safety communities, the RDD has evolved over time into a more robust and current dictionary known as the Justice XML Data Dictionary.

The JXDD V3.0 Prerelease was compiled from approximately 35 data dictionaries, various XML Schema documents, and other XML data models, which are under development or in use within the justice and public safety communities. These sources yielded approximately 16,000 data components (i.e. elements, attributes, and types). Through study and analysis of the similarities and differences among these components, around 2,000 unique (simple) elements and 300 type (complex) definitions were created to represent this common set of data related standards.

## Clarification of Concepts and Terms

Information published about the Justice XML Data Model uses a number of terms (e.g. Data Model, Data Dictionary, Schema, Registry/Repository) that need further clarification. The following clarifying information is intended to quantify the State's understanding of these terms within the Justice XML initiative <sup>2</sup>.

In general terms, the Justice XML Data Model is a logical representation of objects and their relationship to other objects contained within the justice and public safety communities. More specifically, the Justice XML Data Model is a collection of elements with a name, a relationship to other elements, a type, a description, and a possible default value.

That collection has been organized for ease of reference as a data dictionary. The Justice XML Data Dictionary acts as a repository with details on how a specific element fits in the over-all structure, what values the element may contain, and what the element means in real-world terms.

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<sup>2</sup> The explanation of the terms below was based on standard IT definitions and interpretation of Justice XML Data Model presentation material.

The Justice XML initiative also contains a definition for describing and constraining the content of objects detailed in the data dictionary. This deployment resource is the Justice XML Schema, a type of physical data model used to describe Justice “elements” and “types” in an XML format. Utilizing this resource, system developers can combine common XML elements to generate interoperable messages that flow within and across agency boundaries.

Finally, all of the elements that are represented in the Justice XML Data Model will be available and accessible via a Justice Metadata and Component Registry/Repository. A planned storage mechanism that will allow developers to query the existence of registered elements and provide access to its details. The Justice Metadata and Component Registry/Repository is not part of the JXDD V3.0 Prerelease, its development is planned as a future enhancement to the current model.

## State and CJIN Agency Findings

ETS (under the direction of the State CIO) worked in concert with CJIN agency representatives to evaluate the Justice XML Data Model, corresponding JXDD V3.0, and Justice XML schemas. All entities that participated in the evaluation of the data model were asked to provide input from three different perspectives. The first perspective was from the standpoint of independent third party evaluators. This perspective is one in which the initiative was evaluated without consideration as to what effects or ramifications it would have on agencies that are already utilizing XML based technologies. Second, the agencies were asked how they might leverage the model and to identify any potential drawbacks to implementation of the data model. Third, the agencies were asked to provide a statewide perspective. The findings of this analysis are provided below.

### Independent Perspective:

- The Justice XML Data Model was developed with input from a broad range of supporters<sup>3</sup>.
- The Justice XML Data Model, Data Dictionary, and XML schemas utilize an extensive body of pre-existing and widely accepted open industry data standards<sup>4</sup>.

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<sup>3</sup> Office of Justice Programs (OJP) (<http://www.ojp.gov>)  
U.S. Department of Justice - with advice from the Global Justice Information Sharing Initiative (Global) (<http://it.ojp.gov/global/>)  
U.S. Department of Commerce (<http://www.commerce.gov>)  
Institute for Telecommunication Sciences (<http://www.its.bldrdoc.gov>)  
National Telecommunications and Information Administration (NTIA) (<http://www.ntia.doc.gov/>);  
National Institute of Justice (<http://www.ojp.usdoj.gov/nij>)  
Georgia Tech Research Institute (GTRI) (<http://www.gtri.gatech.edu/>)

- The Justice XML Data Model (in conjunction with JXDD V3 and the associated Justice XML Schemas) is very mature and robust. The new version is designed by well-respected industry experts and is based on widely accepted industry standards. It details a very large majority of the common element and type definitions found in the justice and public safety arena.
- Use of Justice XML Data Model allows for improved agency efficiencies by greatly reducing the amount of work required to define potentially thousands of data elements and their associated attributes. Instead, agencies could immediately focus their attention on sharing data via common data element names and formats.
- The Justice XML Data Model is based on standard object-oriented (OO) design principles.
- Database tables and objects can be easily generated once XML schemas are defined. For this reason, application development processes would realize additional efficiencies if the Justice XML Data Model were adopted.

#### Agency Perspective:

Most of the CJIN related agencies have already initiated or will soon initiate XML related initiatives. One agency in particular has done an extensive amount of work to create and implement XML schemas and style sheets, which included redesigning databases, and modifying application code.

- Most agencies stated that Justice XML Data Model was a very good effort that should be embraced. Agencies also agreed that the data model would improve over time.
- If adoption of the model by key federal agencies occurs, then it would almost certainly force CJIN (as well as other state agencies) to utilize JXDD at some point in the future.
- Early utilization of JXDD would occur through XML transform technologies (e.g. XSLT) and would not require any immediate changes to back end systems.
- Agencies that are just beginning to utilize XML would design applications and databases based on the JXDD (and related XML schemas) as they move

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<sup>4</sup> GTRI - (<http://justicexml.gtri.gatech.edu/sources/index.html>)  
 OASIS – Arrest Warrant Schema, Charging Document Schema, Sentencing Order Schema  
 SEARCH – Justice Info Exchange Model (JIEM) data sets  
 NLETS – NCIC 2000 Data Dictionary and Code Tables  
 NIJ – InfoTech v2.0 Data Dictionary and Schema

forward with their XML initiatives. Agencies that have established XML schemas would continue to leverage the model through XML transforms, until such time that modification was necessary.

- Even though the data model is very robust, every agency recognized the fact that schema extensions would be the necessary. Management of the process to introduce extensions will need to be developed. Any agreed upon extensions should be provided back to the Justice XML governing body for evaluation to determine if the change should be incorporated into a future release of the data model. This type of extension management is the same type of activity that would need to occur even if data models and schemas were done by individual agencies.
- Agencies agreed that the learning curve was fairly steep and that XML technology toolsets would be needed to enable developers to understand and utilize the model in an effective manner. Organized support by the Justice XML governing body would also be beneficial.
- Several of the CJIN agencies are actively working to determining ways to incorporate the new Justice XML Data Model into existing architectures. For example one agency is writing directly to the specification, another is using database technology to map table data elements to XML data elements (due to naming restrictions), and yet another agency will likely utilize XSLT to interface with previously defined XML schemas.

#### Statewide Perspective:

- The adoption of this model by a majority of the federal, state, and local justice and public safety entities would improve consistency of data and promote more effective sharing of information.
- Adoption of the Justice XML Data Model would enable agencies to work toward a common and well-supported government sector-specific data model. In addition, state agencies would not be burdened with the administrative overhead and responsibility of maintaining a comprehensive and large-scale data model.
- The utilization of this model would reduce development costs and improve development efficiencies; not doing so would actually drive up the cost of sharing data across agencies.
- Use of industry recognized XML schemas would facilitate the implementation and utilization of Web Services, which would in turn drive the need for and the development of Service Oriented Architectures. Advances in both of these areas would greatly benefit the state as a whole.

- The Justice XML Data Model was developed with direct input from two Legal XML committees (i.e. Court Filings and Integrated Justice). Based on this input consistency between the two efforts has been properly established and is being actively maintained.

## Questions for Future Consideration

- How will long-term support for this initiative occur? There are plans to build a registry/repository for capturing the available elements and types that exist within the model. Who will manage and maintain this registry?
- What are the current acceptance and adoption rates? The goals of the initiative will only be reached if a majority of justice and public safety organizations adopt this standard into their current and future architectures. What is the transition plan for converting existing interfaces to the new Justice XML Data Model?
- Will federal agencies mandate use of the Justice XML Data Model?
- What successes and benefits have other states experienced by utilizing Justice XML?
- What are some challenges and issues that other states have encountered by utilizing Justice XML?

## ETS Recommendations for North Carolina

As a result of this technology review, ETS recommends the following actions be taken by the State of North Carolina as it moves forward in its effort to utilize XML based technologies.

- Update the North Carolina Statewide Technical Architecture ([ncsta.gov](http://ncsta.gov)) to reflect the recent advances in XML based technologies.
- Continue to monitor the development and usage of the Justice XML Data Model (JXDD V3.0) and encourage adoption by state agencies, especially after officially released or specifically required by key federal agencies.
- Identify approaches that can be used to facilitate the utilization of the Justice XML Data Model by CJIN agencies.

- Encourage CJIN agencies to actively participate in the creation and support of current and future releases of the Justice XML Data Model. In addition, CJIN agencies should work together to maintain any extensions to the data model that will occur over time.
- Identify other government sector XML related initiatives that could also be utilized and adopted by the State.

This concludes the ETS technology review of the Justice XML Data Model. Upon review and approval by the State CIO, this report will be posted in the White Papers section on the North Carolina Statewide Technical Architecture Website ([ncsta.gov](http://ncsta.gov)).