NCSC Component Library

Executive Summary

June, 2005

Please note: *The audience for this document are Court and other justice personnel involved in the exchange of the information with the objective of performing the exchanges by way of electronic data sharing. This includes business requirements analysts, system developers, and decision makers responsible for the direction of the Court information exchange direction.*

The goal is to create a common understanding and language between the business (domain) experts and the technical experts. The domain experts do not require a working knowledge of XML, UML or the GJXDM. Likewise, it is not expected that the technical experts will require a level of business understanding anywhere near that of the domain experts. There is an overlap between the two, which this document and the Component Library methodology begin to bridge.

Courts planning for justice information sharing have a heavy burden in terms of sending and receiving information as they are involved in the a large portion of the information exchanges in the justice community. And as the courts move into sharing information electronically with other agencies methods and policy must be developed to insure that they can do so in a reliable and cost effective way.

Sharing information reliably and efficiently requires the use of standards to ensure that parties at either end can consume and understand the information sent. The standard format for sharing information with other agencies electronically has become XML. XML is readily readable by both humans and computers. Additionally, several mechanisms exist to constrain XML documents to certain types of data. The 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 National Information Exchange Model (NIEM) is an interagency initiative sponsored by the Department of Homeland Security to provide the foundation and building blocks for national-level interoperable information sharing and data exchange and is based on and will extend the Global JXDM

For either of these efforts to succeed, the subject matter domains—law enforcement, public safety, the courts, etc.—must be able to collaborate with each other and other domains as well as develop and promulgate specifications for those information exchanges relevant to them within the context of the larger GJXDM or NIEM frameworks. Successful implementation requires the simultaneous development of consensus on technical standards, policy requirements and operational procedures, as well as the development of a high degree of mutual trust among critical players.

The Joint Technology Committee (JTC) of the Conference of State Court Administrators (COSCA), the National Association of Court Managers (NACM) and the National Center for State Courts (NCSC), in concert with the Conference of Chief Justices (CCJ), is providing the governance, policy and technical standards adoption processes by which the state courts can fulfill their role as full partners in justice information exchanges and contribute to the evolving GJXDM and NIEM initiatives.

With the assistance and guidance of the Bureau of Justice Assistance (BJA), NCSC is helping the JTC develop the necessary governance structures, establish court information sharing policies and procedures, educate the court community, represent the court community in interdisciplinary working groups and training activities, and develop court information exchanges.

NCSC is working with the court community to develop a service-oriented Court Information Model that will become a repository of court business processes and associated services. This model is based on the concept of reusable components and will create a common understanding and language between court business leaders (domain experts) and technical experts.

Early work on the Court Information Model has resulted in the development of the Court Component Library as the court's method of approaching the development of Information Exchanges Packages Documentation (IEPD) as defined by the GJXDM XML Structure Task Force. The Court Component Library provides a repeatable process for developing IEPDs that is accessible both in terms of vocabulary and structure to court domain experts. The Library applies open standards, encourages component reuse, is consistent with court business models and provides an easy bridge to the GJXDM and NIEM frameworks today and other frameworks

as they evolve. Key goals behind the Component Library and methodology are:

Standards:

1. To apply and support open standards usable in any development approach or by any set of tools.
2. To apply W3C standards for component version control.

Methodology

1. To facilitate standardized and accessible IEPD development with consistent and reusable court components and to support the concept of component reuse by the courts in the subsequent development of local data models.
2. To reduce costs and increase efficiency of IEPD development.
3. To provide training and education opportunities to facilitate information sharing in the context of the GJXDM.
4. To facilitate development collaboration between the courts and other justice domains.
5. To apply the domain expertise of court personnel in the creation of these court-specific models.

Component Library

1. To create a common understanding and language between domain experts and technical experts.
2. To create a bridge between the court's needs and the GJXDM and the NIEM frameworks, as well as other frameworks as they evolve.
3. To develop a court-specific vocabulary and structure for models used for data exchanges.

Each of these goals is important in achieving the overall goal of the Component Library, which is to facilitate information sharing within the court community and between courts and other justice

partners through IEPD development and beginning progress on a service-oriented Court Information Model.

Without an integrated tool the development of an Information Exchange Package Documentation has required the use of multiple tools. Typically, a conceptual (domain) model for the document is first created using UML modeling tools such tools as ArgoUML© or Poseidon for UML©. Once a baseline class diagram representing the document through a conceptual model is agreed upon, the components in the diagram are manually entered into a spreadsheet for mapping to the GJXDM. Through a combination of sub-schema generation, manual creation of the document schema, extension schema, and constraint schema, through schema specific tools a package is developed. In addition to being a cumbersome process, these artifacts are developed independent of each other – any change in the conceptual document model must ripple through each of the subsequent artifacts and requires considerable time and the potentiality for error exists.

To overcome these complexities, NCSC worked with URL Integration to develop a tool that would allow for easier, efficient and consistent IEPD development. DataModeler © (DM) is an integrated design and development tool used in the creation of XML schemas. DM was designed around the evolving standards adopted by the Federal government utilizing the Global Justice Data Model as the standard schema structure. DM integrates each step of development through a comprehensive tool that facilitates the generation of schema, conformant to these standards, from beginning to end. DM bridges the gap between the knowledge of the business domain expert, the analyst, and the developer to produce schemas and UML data models consistent with the domain expert's expectations.

DM enables conceptual domain modeling, schema search capability, mapping, GJXDM paths identify the location of element or terminal node that will contain the instance data, and schema generation. The mapping ensures GJXDM conformant schemas. DM tightly integrates the development process by producing artifacts and making them available for use in each subsequent step. This mechanism ensures consistency between artifacts and culminates in the automated development of all schemas as well as the GIEP Document. The artifacts DM produces are based on open standards and may be imported from or exported to other tools.[1] Benefits of using DM include:

- Condensed Timeline: Based on work in multiple locations, typical schema development time has been cut in half by using DM.
- Consistency: Manual transfer of data from one step in the methodology to the next is fraught with error. Using software to automate this process minimizes the opportunity for inconsistencies.
- Intuitive Data Model Navigation: The XML Elements Viewer in DM gives the user the power to intuitively navigate through the GJXDM or any other imported/extended elements.
- Accurate GJXDM conformant paths: Through utilization of the search tool, the complexity of the GJXDM data model is such that it is very easy to create paths that are valid. DM does not permit invalid relationships in the generation of a GJXDM path. .Manual tools allow for the creation of paths that do not conform to relationships present in the GJXDM model.
- Collaborative Modeling: DM has been specifically designed to allow for multiple users. This is achieved by making the diagram, mappings, and XML components

[1] Tools such as ArgoUML©, Poseidon for UML©, Rational Rose©, System Architect©, XML Spy©. Export and import capability is through XML Metadata Interchange (XMI) and XML schema.

available to multiple developers through a web interface. Users can simultaneously manipulate namespace components while remaining synchronized with each other.

- Conformant Extensions: One of the most difficult tasks in creating the schema is developing compliant extensions of GJXDM types. Extensions are allowed when a data field cannot be mapped to a GJXDM element. DataModeler uses a wizard to guide the user through this process and ensures compliant data types and elements.

Using the Court Component Library and DM, teams of court practitioners and participants from other justice domains have developed five IEPDs (traffic citation, protection order, sentence order, warrant and Court Statistical Guide). Under the governance of the JTC, these information exchanges are currently undergoing an extensive vetting process and have been targeted for completion of the formal approval process as court standards next year. JTC will continue to identify priority exchanges and NCSC will work with the courts and their exchange partners to expand and refine the Court Component Library and promulgate new IEPDs.