

Global JXDM Implementation Guidelines

Introduction

The Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and Dictionary (Global JXDD) are the result of an effort by the justice and public safety community 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 conformance that this entire schema be used for validation. Nonetheless, there are several informal conformance requirements.

The goal of Global JXDM conformance 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.

These conformance rules serve as guidelines for any agency utilizing the Global JXDM to implement their information sharing exchanges. Grantees of the Office of Justice Programs who are developing inter-agency XML-based exchanges must comply with the special condition language contained in the grant and follow the associated Global JXDM implementation guidelines outlined below. Grantees with special condition language requiring use of the National Information Exchange Model (NIEM) may click [here](#), as the following conformance guidelines apply only to those implementations using GJXDM version 3.0.3 or earlier. Additional information on the relationship between GJXDM and NIEM can be found below under the heading **GJXDM Evolution**.

Conformance Rules

This section will summarize the conformance rules. Subsequent sections will provide more detail and references to additional information. The informal rules for Global JXDM conformance are as follows:

1. Instances must validate against the Global JXDM reference schema. Schemas conformant to the Global JXDM must import and reference the Global JXDM Schema namespace or a correct Global JXDM Schema Subset (which is the same namespace).
2. If the appropriate component (type, element, or attribute) required for the application exists in the Global JXDM, use that component (i.e., do not create a duplicate of one that already exists).
3. Be semantically consistent. Use Global JXDM components in accordance with their definitions. Do not use a Global JXDM element to represent data other than what its definition describes.
4. Apply XML Schema extension rules correctly and consistently.

Schema Subsets

The Global JXDD has grown to accommodate the needs of a large and varying user base. Though a large dictionary in itself is not a problem, users can experience difficulties when using the large XML schema generated from the full dictionary. In many practical use cases, only a

subset of the full Global JXDD is required. Likewise, it is possible to validate with a reduced set (a subset) of the Global JXDM components. For a detailed explanation of the concept of schema subsets, refer to [Customized Schemas](#). To learn how to construct subsets manually, refer to [Rules for Schema Subsets](#).

Realizing that the rules for manually creating a Global JXDM Schema Subset can be daunting and potentially error-prone, an online tool that can automatically generate a correct Schema Subset has been developed. This tool, the [Schema Subset Generation Tool \(SSGT\)](#), is now available. This valuable tool provides developers with the ability to create Global JXDM Schema Subsets based on the [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.

Reference Architecture

In order to understand how to use a Global JXDM Schema Subset for validation, it is essential to understand the Global JXDM *reference architecture*. A very brief introduction to this concept follows.

In general practice, an XML instance references an XML schema, which in turn references the World Wide Web Consortium (W3C) XML Schema specification (by namespace). The instance is valid if it conforms to its respective schema definition, which then conforms to the W3C XML Schema specification. The Global JXDM schema, rendered from the Global JXDM, introduces a set of types, elements, and attributes as predefined building blocks for use in justice schemas. Within the Global JXDM Schema, these components are optional, over-inclusive, and unconstrained. However, for practical use in validating real instances, the correct components must be identified and constrained, as necessary. This process requires validation against two slightly different schemas:

1. The full Global JXDM Schema or a correct subset.
2. A constraint schema that reflects the subset, but with applied constraints.

The two schemas represent two distinctly different validation paths. The first validates for conformance to the Global JXDM, and the second validates for conformance against the user's required constraints.

In review, instead of:

- an instance,
- the user schema, and
- the W3C Schema specification,

the result is:

- an instance,
- the user schema,
- an optional user extension schema,
- the full Global JXDM Schema or a Global JXDM Schema Subset,
- a corresponding constraint schema, and
- the W3C XML Schema specification.

For a brief illustration of these concepts, refer to the presentation on the [Reference Architecture](#) page. For more detailed examples and discussion, refer to the presentations and online training materials from the [Global JXDM Developer's Workshop](#) held in Atlanta, Georgia.

Component Extension

There are several ways that a local schema might extend the Global JXDM. A simple set of examples has been prepared that illustrates various **extension methods**. One of these methods is based on the World Wide Web consortium (W3C) rules for **extension of XML Schema types**. W3C Schema rules for type extension allow many possibilities. However, type extension within the Global JXDM is intended to maintain a class hierarchy of objects by adhering to a more restrictive set of subclass rules.

To ensure the integrity, consistency, and meaning of the Global JXDM class (inheritance) hierarchy, the following rules for type extension must be followed:

1. A derived type may add (by extension) additional fields (elements/attributes) to its base type.
2. A derived type may restrict one or more fields of its base type, but only so that a derived field is a subset of the field of the base type. For example, a derived type may:
 - Restrict an enumeration from a large set of options to a smaller set of options, as long as every option in the derived set appears in the base set.
 - Remove a field of the base type only if the field is optional in the base type.
 - Require a field to appear only if the field is optional or required to appear in the base type.
3. A derived type may not modify a field of its base type such that it violates the constraints of its base type. For example, a derived type may not:
 - Add additional enumerations to a field.
 - Remove a field that is required by its base type.
 - Modify the type of a field of its base type.

Additional Remarks About Conformance

Information exchanges conform to the Global JXDM; systems do not. The way data is labeled or used in one system does not impact Global JXDM conformance. Conformance relies upon how data is packaged as XML for an information exchange.

Use of some components of the Global JXDM to exchange information with other justice agencies does not guarantee conformance to Global JXDM. Users should be careful to avoid violating conformance Rule 2, listed above. An information exchange either conforms to Global JXDM or it does not.

The Global JXDM conformance rules are, by design, nonresident. More formally specified rules would be counter-productive to the development of the evolving Global JXDM.

Grant Recipient Schema Registration Requirements

To support public safety and justice information sharing, all recipients of Office of Justice Programs (OJP) grants for projects implementing XML technology are required to use the Global Justice XML Data Model (Global JXDM) Specification and Implementation Guidelines. OJP grantees are further required to register and make available without restriction all schemas (extensions, constraint, proxy) generated as a result of this grant to the component registry. Schemas should be registered in the **Information Exchange Package Documentation (IEPD) Clearinghouse** and also to the **Justice Standards Clearinghouse (JSC)**. This requirement is stipulated as a Special Condition to their grant under the title of "Support Public Safety and Justice Information Sharing."

Other organizations, not funded by OJP, that use the Global JXDM, are encouraged to register

their XML Schemas (extensions, constraint, proxy) to both the IEPD Clearinghouse and the JSC in order to facilitate potential interoperability of information systems that will enhance the potential for sharing of Justice-related information.

GJXDM Evolution

A recent partnership between the US Departments of Justice and Homeland Security have paved the way toward evolving GJXDM from its current justice and public safety focus into a broader scope to include homeland security, intelligence, and other communities. This initiative is known as the National Information Exchange Model, or NIEM. This shift is a reflection of the critical need to exchange information not just among current partners, but reaching out beyond historical boundaries to make the nation safer on all fronts through efficient and effective information sharing.

This national coordination effort will result in the next major release of GJXDM (version 4.0) functioning as the justice domain within the NIEM framework. Developing conformant GJXDM/NIEM exchanges will depend on new factors including a NIEM Naming and Design Rules (NDR) and others, but will be assisted by new tools and documentation to guide implementers in its use. For the latest information on the status of NIEM, please visit <http://www.niem.gov>. NIEM and GJXDM convergence is planned for early 2007. Prior to this time there may be a need to build new exchanges based on GJXDM 3.0.3 or older. This will be permissible under the special condition "Support Public Safety and Justice Information Sharing" up to the date when the next major version of NIEM is released (NIEM 2.0), at which point the co-alignment of standards will be established and publicized. The use of NIEM in justice and public safety implementations satisfy all requirements regarding the use of GJXDM.