

National Information Exchange Model (NIEM) Component Mapping

NIEM Component Mapping Overview

NIEM Component Mapping is the process of identifying and characterizing similarities and differences between the NIEM and another data model. The data model can be in the form of an Extensible Markup Language (XML) vocabulary (data element dictionary); XML reference schema; or a document, form, or information exchange package (IEP) template or schema. A data model can also be an entity-relationship diagram (ERD), unified modeling language (UML), data description language (DDL), or data element dictionary for a database being accessed, updated, and/or queried through NIEM-compliant IEPs.

The current NIEM baseline is Global Justice Information Sharing Initiative (Global) Justice XML Data Model (Global JXDM), Version 3.0.2. Although developed to support the law enforcement and justice domains, the Global JXDM has substantial applicability to other domains, e.g., homeland security or transportation. However, there are gaps between the Global JXDM and data exchange requirements in these other domains, and it is essential to identify, characterize, and fill these gaps. The NIEM Component Mapping process identifies and provides a basis of reconciling these gaps.

The Global JXDM is available in the form of an XML reference schema and a Microsoft Excel Workbook that lists the Global JXDM classes and subclasses, as well as the Global JXDM elements and attributes (<http://it.ojp.gov/jxdm/>). The Excel Workbook is the recommended Global JXDM source document for the component mapping. The XML reference schema may also be helpful, particularly if it can be viewed graphically (e.g., with XML Spy or Turbo XML). The NIEM tools will be available soon on www.neim.gov. Until NEIM tools become available, it is recommended that the Global JXDM Viewer should be used at <http://gjxdmtools.gtri.gatech.edu/ssgt/viewer>.

A standard NIEM Component Mapping template has been developed to facilitate component mapping. The template that can be downloaded from the www.neim.gov Web site provides a convenient format for capturing the results of the mapping process. The template can be used as is (preferred) or modified to meet specific mapping needs. Although the use of the template is recommended, the NIEM Component Mapping team will gladly accept component mappings in any format.

NIEM Component Mapping Objective

The primary objective of the NIEM Component Mapping is to identify and characterize similarities and differences between NIEM and another data model. The results of the component mapping provide a basis for:

- NIEM content
- NIEM revisions and refinements
- Legacy data exchange representation and enterprise database mapping rules
- Domain-specific NIEM component extensions
- Usage context for individual components

The specific benefits of the NIEM Component Mapping are:

- Recommendations for new NIEM content, e.g., new core and universal-core components
- Recommended revisions to NIEM, e.g., definitions and relationships
- Mapping rules between legacy data sources and NIEM
- Basis for extending and constraining NIEM components for domain-specific applications
- Basis for future enterprise data model development

NIEM Component Mapping Process

The NIEM component mapping process involves identifying and characterizing gaps at the entity (class), element (database attribute), and value (literal) levels. Component mapping categorizes data-source components at each level as matching (equivalent), partially matching, or not matching a component or components within the Global JXDM. Matching components include those where the component names may differ, but the components themselves are semantically and structurally equivalent (i.e., a one-to-one mapping between the Global JXDM and the data source component). Partial matches can arise when there are similarities but also some differences between components. These differences can include semantic and/or structural mismatches; naming collisions; and mismatches at the value set, datatype, and/or lexical levels. Data source components with no matching Global JXDM components comprise a set of additional entities and element types that are candidates for inclusion into the NIEM.

The NIEM component mapping process includes providing a recommended action for reconciling a gap. Depending on the nature of the gap, the action may include adding a new or subordinate type, adding an element, extending a value set, modifying a datatype or lexical representation, renaming components, or revising a definition.

The Component Mapping template can be downloaded from the www.neim.gov Web site. The template is self-explanatory and has column definitions, instructions, and examples to facilitate the mapping process. Once the mapping process is finished, the spreadsheet can be sent to the Component Mapping team leader, Mini Kanwal, at kanwalm@saic.com, for review and reconciliation into NIEM.

