

Digital Government Strategy (DGS) / Open Data Policy (ODP) and the National Information Exchange Model (NIEM) Relationship and Frequently Asked Questions

April 25, 2013

	DGS/ODP	NIEM	Data.gov
Purpose	The purpose of the Digital Government Strategy (DGS)/Open Data Policy (ODP) is to ensure Government Agencies manage information as an asset throughout its life cycle. In particular, at each stage of the life cycle agencies must take steps to promote openness and interoperability, where appropriate, and to properly safeguard systems and information.	NIEM provides government-wide tools for communities to standardize exchange of information based on a common, unambiguous understanding of the meaning of that information. It ensures that a basic core set of information, documented exchanges between parties, and a subset of selective functional standards as endorsed by external standards bodies.	The purpose of Data.gov is to increase public access to high value, machine readable datasets generated by the Executive Branch of the Federal Government.
Policy	Is it a policy? Yes - The Managing Information as an Asset Policy, also known as the Open Data Policy, is currently being developed by OMB.	Is it a policy? No - It supports the Federal Enterprise Architecture Data Reference Model (DRM) - It <u>is a best practice for the</u> National Information Sharing and Safeguarding Strategy - Has become policy for internal use at DOJ, DHS and HHS - NIEM is codified as mandatory for use (therefore policy) for homeland security, and justice grants to state and local partners.	Is it a policy? No -Data.gov supports The President's Memorandum on Transparency and Open Government, OMB Open Government Directive, OMB Circular A-130 and OMB Memorandum M-06-02.
Method (how does it drive standards)	Promote open standards	<u>Promotes open standards, common data models, and repeatable lifecycle processes to ensure exchanges between parties includes documentation of business rules as well as XML schemas.</u>	Collects meta data from each Agency and populate the Data.gov repository and makes data easily accessible to the public.

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	DGS/ODP	NIEM	Data.gov
Standards	Open Standards - Vendor Neutral - Product Neutral	- Open Standards (W3C XML/XSD) - Vendor Neutral - Product Neutral - While an XML Schema rendering of the entire model exists, RDF and UML are also supported. - makes use of OMG UML Profile Standards - Enables the creation of standards through external SDOs such as the IEC	- Application Programming Interfaces (APIs) - Combining the best of REST and SQL, SODA 2.0 is optimized for modern web and mobile applications - Using Socrata APIs - Agency data.jason files
Solutions/ Tools	- Project Open Data Repository	- NIEM Repository of Exchanges - NIEM tools / toolkits - NIEM Communities could use Project Open Data repository to increase exposure	- Data.gov

Frequently Asked Questions

What is the relationship between efforts underway for the DSG/ODP, NIEM and Data.gov?

Each of these initiatives has a discreet, targeted focus, but all are aimed at increasing access and use of government data. Data.gov has provided a central place to find data and applications for publically releasable information. New applications and services to better serve citizens have been produced as a result in the increase of information made available through Data.gov. The DGS/ODP policy establishes a framework to help institutionalize the principles of effective information management at each stage of the information's life cycle. The framework can help agencies build information systems and processes in a way that increases information and system interoperability, openness, and safeguarding – mutually reinforcing activities that help to promote data discoverability and usability. NIEM, as a government-wide program provides tools to enhance the way many communities build standardized exchanges to increase mission performance. NIEM fully aligns to the DGS/ODP policy and can be seen one of the tools for implementation.

What is NIEM?

- NIEM provides a commonly understood way for various organizations to connect data that improves government decision making for the greater good. By making it possible for organizations to share critical data, NIEM empowers people to make informed decisions that improve efficiency and advance and fulfill organizational missions.
- NIEM is not a standard, database, software, or the actual exchange of information. Rather, NIEM provides the community of users, tools, common terminology, governance, methodologies, and support that enables the creation of standards. As a result, organizations can “speak the same language” to quickly and efficiently exchange meaningful data.

Who are some of the participants in NIEM?

- As to date, there are 14 domains or communities established within NIEM. These are the Biometrics, CBRN (Chemical, Biological, Radiological, Nuclear), Children, Youth, and Family Services, Cyber, Emergency Management, Health, Human Services, Immigration, Infrastructure Protection, Intelligence, International Trade, Justice, Maritime, and Screening Communities.

Who has access to NIEM?

- NIEM is used in all 50 states and internationally, NIEM is available in the public domain and therefore free to use by any member of the public with access to the Internet. It is a consistent starting point—which includes a data model, governance, training, tools, technical support services, and an active community—that assists users in adopting a standards-based approach to exchanging data.

Does NIEM dictate the use of one standard over others?

- NIEM does not dictate the use of one standard over another. NIEM is implemented using W3C XML Schema and OMG NIEM UML profile. The information that is commonly or universally exchanged between participating domains is organized into information exchange packages (IEPs) in the form of XML schemas.

NIEM is an XML based standard, does it support a JSON standards-based application?

- NIEM is expressed in XML, but designed and managed as a logical model (format- free); NIEM can be expressed in RDF today.
- UML Profile for NIEM provides a platform-independent capability to leverage JSON / RDF / OWL and other formats.

- Market forces and community requirements will drive new NIEM formats beyond XML. For example, JSON based from NIEM is supported in Open-XXD from Oracle.

When is it suitable to use XML, and when is it more suitable to use JSON?

JavaScript Object Notation (JSON). JSON is a text-based open standard designed for human-readable data interchange. It is derived from the JavaScript scripting language for representing simple data structures and associative arrays, called objects. Despite its relationship to JavaScript, it is language-independent, with parsers available for many languages.

Due to its simplicity of design, JSON is a natural notation for JavaScript-based applications.

The JSON format is often used for serializing and transmitting structured data over a network connection. It is used primarily to transmit data between a server and web application, serving as a favored alternative to XML for content delivery systems due to its size and ease of parsing.

Extensible Markup Language (XML). XML is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. It is defined in the XML 1.0 Specification produced by the W3C, and several other related specifications, all gratis open standards.

The design goals of XML emphasize simplicity, generality, and usability over the Internet. XML combined with XSD is widely used for the representation of arbitrary data structures, for example in web services, within Service Oriented and Event Driven Architectures for high volume transactional systems. XML is extremely flexible and can be used for complex implementations for system to system exchanges include runtime validation of data.

Comparison of features

Capability	XML	JSON
Verbosity	XML is a verbose, extensible language focused on semantic interoperability.	JSON is a simple notation for capture of arbitrary data structures in arrays and value pairs.
Design	XML is by design, generic and unconstrained allowing for flexibility and extensibility. XML includes features for data structures and content, as well as semantics, rules, policies, rendering and security as examples.	JSON by design is simple and limited to data structure and content.

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¶ Many application programming interfaces (APIs) have been developed to aid software developers with processing XML data, and several schema systems exist to aid in the definition of XML-based languages.

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Reuse	There is a wide range of reusable software available to programmers to handle XML.	JSON is a simpler notation requiring less specialized software to process.
Structure	XML is a hierarchical data model that maintains data types.	JSON simple structures are based on arrays and records. Data typing is limited.
A common exchange format	XML is a document based exchange format. XML is often combined with XSD. XML can easily be transformed to JSON.	JSON is a simple data exchange format. JSON to XML transformation is not straightforward.
Data Views	XML can display many views of one data using XSLT.	JSON does not provide display capabilities.
Data Types	XML documents can contain any binary data type - from text and numbers, or multimedia objects such as sounds, to active formats like Java applets or ActiveX components. XML data types including code values, date and numbering can be validated at design and run time.	JSON is optimized for data, not binary objects, and does not include extended validation for code values, date and number formatting.
Adaptation	XML a mature standard and is being widely adopted for Service Oriented Architecture exchange, web form data capture.	JSON is relatively new. Its simplicity and the ease of use is driving adoption within web applications for content delivery.

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Is NIEM counterintuitive to using agile development processes?

- The model is never used in its entirety—rather NIEM is a subset for a particular information exchange.
- NIEM enables communities to rapidly deploy content to mission specific portions of the model without NIEM Program involvement/support.
- Vendors, by implementing the UML Profile for NIEM, have significantly increased the speed to implementation in the past 12 months. For example:
 - NoMagic's NIEM-UML tool, MagicDraw, provides a point-and-click interface that simplifies development of NIEM schemas.
 - Oracle sponsors a CAM Editor with NIEM capabilities, based on OASIS CAM public open source standards, that allows for automated generation of NIEM schemas.
 - Microsoft and Eclipse have reporting work on similar initiatives.

Where does the NIEM Community fit in the DGS/ODP?

The NIEM tools and toolkits can be found at NIEM.gov. Any tools relevant to the NIEM community may also be registered in the NIEM Tools catalog to ensure reuse across the NIEM community at NIEM.gov.

Has the NIEM community embraced the DGS/ODP direction?

- Treating information as a national asset is core to the Open Data Policy and the National Strategy for Information Sharing and Safeguarding. Departments and agencies will need an end-to-end Data Strategy that accommodates both codified in IT governance.
- Both are aimed at liberating data from the bounds of the application into exposure for unintentional users and uses (as permitted by law and policy).
- NIEM has become a best-practice implementation of the new National Information Sharing and Safeguarding Strategy.

- NIEM is fully supportive of the implementation of ODP and is positioned to become an early adopter.
- NIEM provides a common data model, governance, training, tools, technical support services, and an active community.

Is NIEM vendor agnostic? Does it place some industry players at an advantage?

- NIEM is in the public domain, accessible to the competitive market.
- UML Profile for NIEM opens the door for additional vendors.

Does NIEM conform to the DGS/ODP requirements?

- NIEM adheres to the DGS/ODP Policy. NIEM Communities use open standards such as XML / XSD, and UML to assist in the development of standardized ways of exchanging information across and between government agencies. NIEM is vendor and product neutral. The adoption of the UML profile will allow additional open standards implementations of NIEM based exchanges as supported by community requirements.
- Some NIEM Communities submit their NIEM based information exchanges to external standards development organizations to increase industry adoption such as the NIEM Biometrics and NIST, NIEM Radiological / Nuclear and IEC.

How has NIEM been used in the past and what are potential uses in the future?

Use Case 1: Suspicious Activity Reporting: For local police, security personnel, and federal agents, there is one primary, constant question: How do we keep this superstructure safe from vandals, criminals, and terrorists? And how can we distinguish between tourists innocently seeking souvenir images, and terrorists engaged in pre-operational planning with the intent to destroy the building and all that stands in its path? NIEM makes it possible for suspicious activity reports to be generated in a standard way to express and share information between agencies.

Use Case 2: DHS Domestic Nuclear Detection Office Goes NIEM: A vehicle is headed down Interstate 270 south toward Washington, DC. As it passes through Frederick, Maryland, 50 miles north of the capital, it crosses a sensor ring and trips a radiation sensor. At the 45-mile marker, it trips another one; another again at 40. Continuing south, it sets off sensor after sensor. What might at first have appeared to be a false alarm or a nuisance now appears to be a "hot" vehicle speeding toward a highly sensitive location, and is more than likely a real threat. The SETCP demonstrated that, when needed, non-experts could develop NIEM-conformant messages rapidly. It showed, further, that watch officers, analysts, and scientists could read and interpret those messages, even when they were sent machine-to-machine.

Use Case 3: NIEM and the Prescription Drug Monitoring: Many states are using NIEM to establish standard reporting channels for state to state exchanges of prescription drugs for monitoring against drug diversion. The benefit of using NIEM ensures one format is used by all 50 states to facilitate the implementation of the comprehensive prescription drug monitoring exchange. This exchange being piloted in a few region areas is targeted for nationwide rollout to maximize data reuse, increase reliability, accuracy, integrity, and completeness of data and assist in early detection and prevention of drug diversion and abuse across prescribers, patients and pharmacies.

Use Case 4: NIEM helping children at risk: The need to measure the progress states are making toward achieving permanent homes for children has stimulated the need for performance measures, which, in turn, has expressed the need for data exchanges between courts and child welfare agencies.

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NIEM provides a comprehensive framework for structuring the data exchanges so that each state can begin with a template, rather than having to start from a blank slate. This template provides vendors with a common set of data requirements that will be needed by all states, thus reducing the cost of incorporating them into existing case management systems. Exchanging data enables courts and child welfare agencies to obtain needed data elements for which they are responsible and to use these data elements to construct performance measures and management reports. Electronic data exchanges provide both courts and child welfare agencies with timely, complete, and accurate information upon which to make decisions promoting child safety, permanency, and well-being. Moreover, unless performance measures can be produced efficiently and cost-effectively, they will not be used to promote best practices in child welfare or to effect policy change.

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