Introduction to National Information Exchange Model (NIEM)

Instructor Name: Deborah L. Brooks

Date of most recent change: May 1, 2015

The MITRE Institute
Stay ahead of the curve

MITRE

Agenda

1. Introduction
2. NIEM Community
3. NIEM Technical Framework
4. Information Exchange Package Documentation (IEPD) Development and Implementation
5. NIEM Adoption
6. NIEM Support Framework

Acknowledgement: The MITRE Institute Introduction to National Information Exchange Model (NIEM) course draws extensively from materials developed and published by the NIEM Program Management Office (PMO).

1- Introduction

1.1 Need for Information Sharing Standards

1.1 Need for Information Sharing

- **Information sharing can improve an organization's ability to fulfill its mission goals**
  - Improve decision making capabilities by providing more timely and reliable data
  - Increase organizational agility in response to problems and changing environments
  - Avoid costs associated with redundant processes and data

1.1 Information Sharing Policy

- **Since the September 11th terrorist attacks, a number of policies advocating information sharing have been issued:**

Issued	Policy
Oct. 18, 2001	Critical Infrastructure Protection in the Information Age
Nov. 25, 2002	Homeland Security Act of 2002
Jul. 29, 2003	Homeland Security Information Sharing Executive Order 13311
Dec. 17, 2004	Intelligence Reform and Terrorism Prevention Act of 2004
2004-2005	Sharing of Terrorism Related Information
2007	Implementing Recommendations of the 9/11 Commission Act of 2007

1.1 Barriers to Information Sharing

- **Lack of consistent policies, standards, and practices across government agencies**
- **Costly and redundant processes**
- **Lack of a common understanding of data definitions**
- **Lack of consolidated data for agency-level reporting and decision support**
- **Lack of trust between government organizations due to poorly communicated data management strategies**
- **Cultural tendency towards “need to know” vs. “need to share”**

1.1 Need for NIEM

- **In addition to policy, there is a need for information sharing standards, such as the National Information Exchange Model (NIEM)**
- **NIEM focuses on several barriers to information sharing**
  - Lack of existing exchange standards for cross government mission critical data
  - Costly and redundant information exchange development processes
  - Lack of a common definitions for commonly used data
- **The National Information Exchange Model (NIEM) facilitates the design, development, and adoption of information exchange specifications**

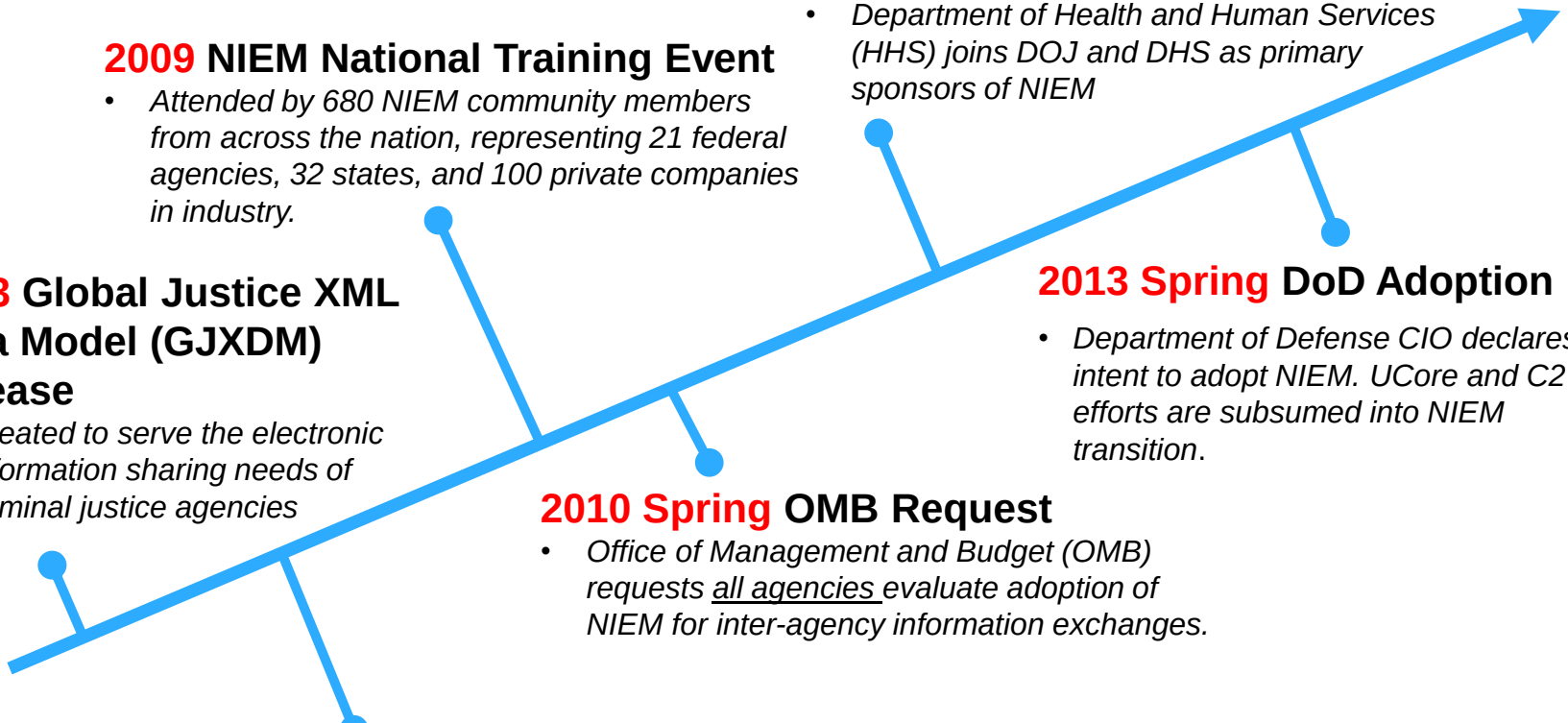
1- Introduction

1.2 NIEM Overview

1.2 Key Features of NIEM

- **NIEM is a federal, state, local, tribal, and private initiative that provides a foundation for seamless information sharing**
- **NIEM connects communities of people who share a common need to exchange information in order to advance their missions through the development of Information Exchange Package Documentations (IEPDs), which are standard specifications for information exchanges**
- **NIEM supports standardization through a common vocabulary, standard exchange specification design process, and standard exchange specification artifacts**
- **NIEM provides online technical tools to support development, discovery, dissemination, and reuse of exchange components and specifications**

1.2 Background of NIEM



2003 Global Justice XML Data Model (GJXDM) Release

- *Created to serve the electronic information sharing needs of criminal justice agencies*

2005 DOJ and DHS establish NIEM

- *Developed from DOJ's GJXDM*

2009 NIEM National Training Event

- *Attended by 680 NIEM community members from across the nation, representing 21 federal agencies, 32 states, and 100 private companies in industry.*

2010 Spring OMB Request

- *Office of Management and Budget (OMB) requests all agencies evaluate adoption of NIEM for inter-agency information exchanges.*

2010 Fall HHS Sponsorship

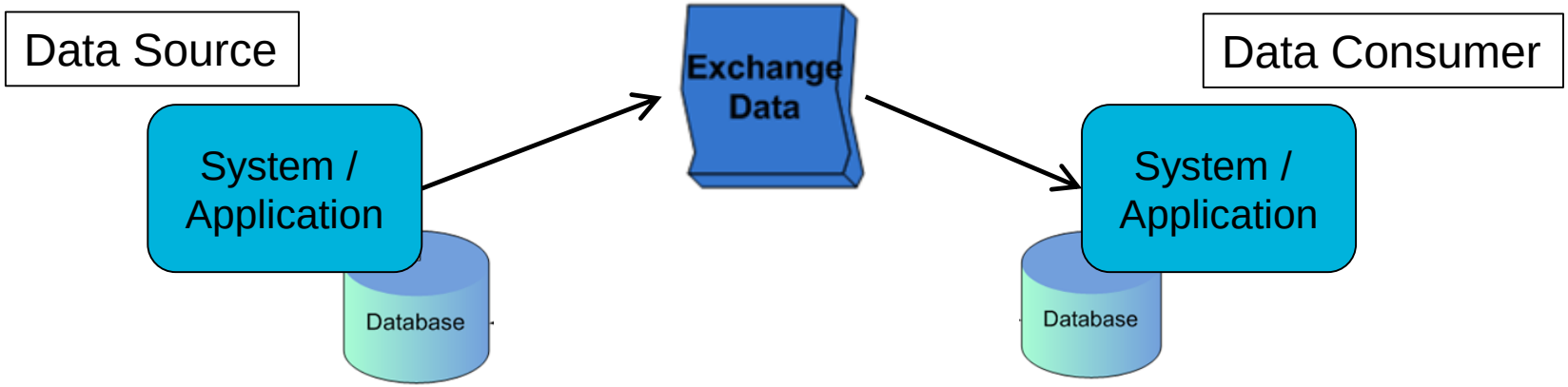
- *Department of Health and Human Services (HHS) joins DOJ and DHS as primary sponsors of NIEM*

2013 Spring DoD Adoption

- *Department of Defense CIO declares intent to adopt NIEM. UCore and C2 Core efforts are subsumed into NIEM transition.*

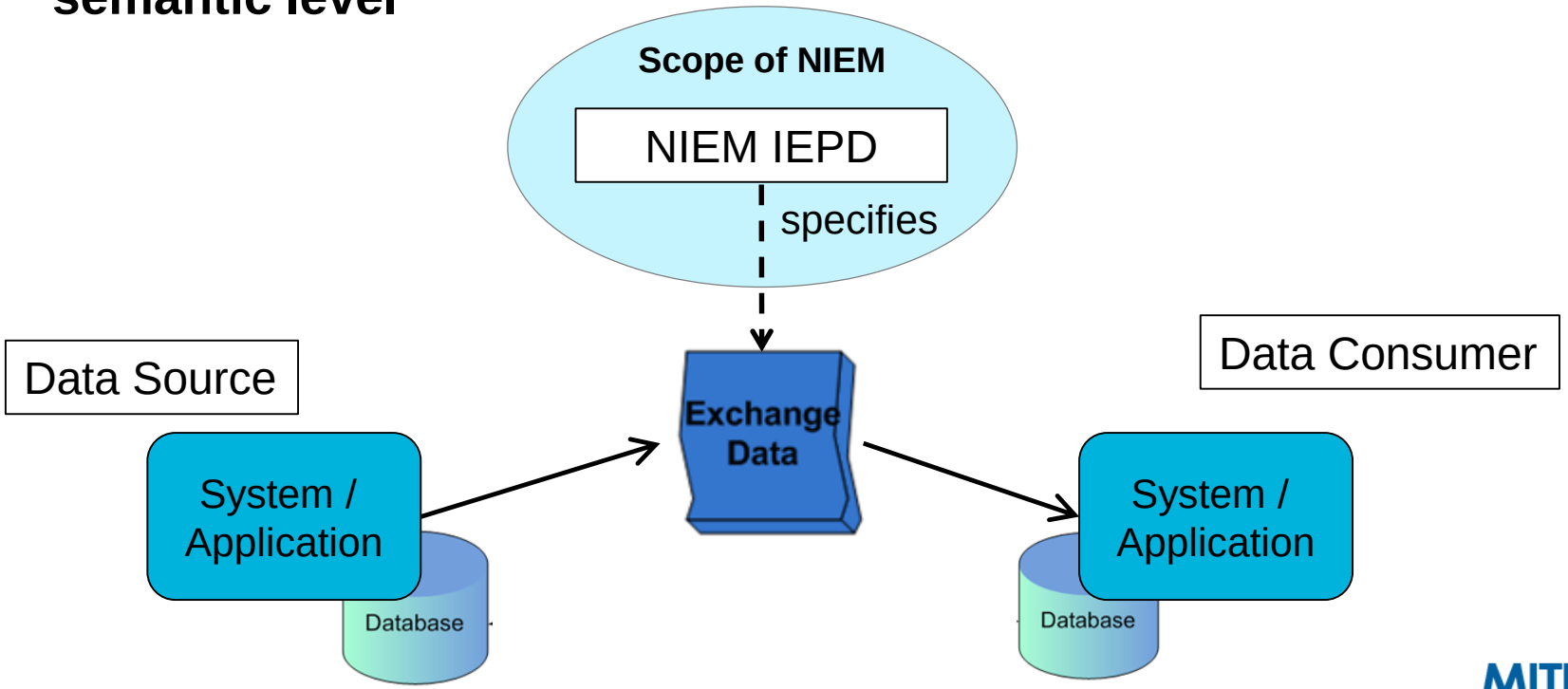
1.2 The Data Interoperability Problem

- **Get data from the Data Source to the Data Consumer**
- **Describe the exchange data so that the receiving system / application knows what content and format to expect from the source system / application**
- **The information exchange won't work unless the producers and consumers have a shared understanding of the exchanged data**



1.2 Scope of NIEM

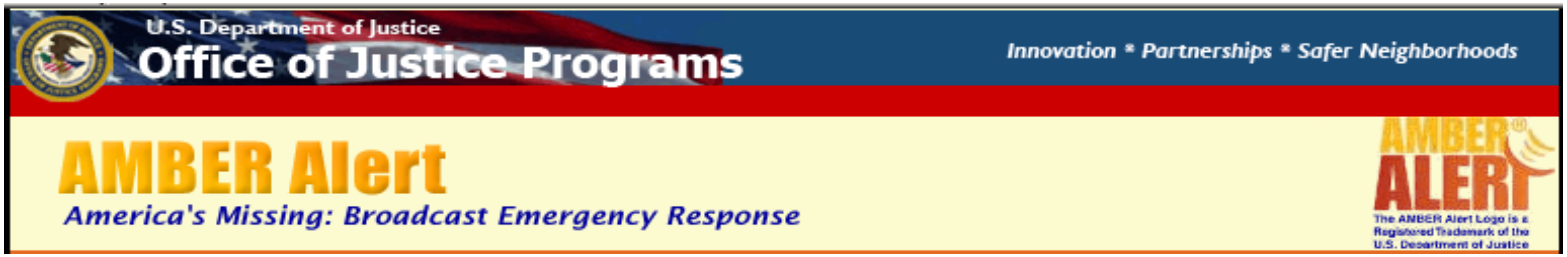
- **NIEM provides the components for building the standard specification (the IEPD) for an information exchange**
- **A NIEM IEPD describes the data contained in the message payload of an information exchange**
- **NIEM addresses the issue of data interoperability at a semantic level**

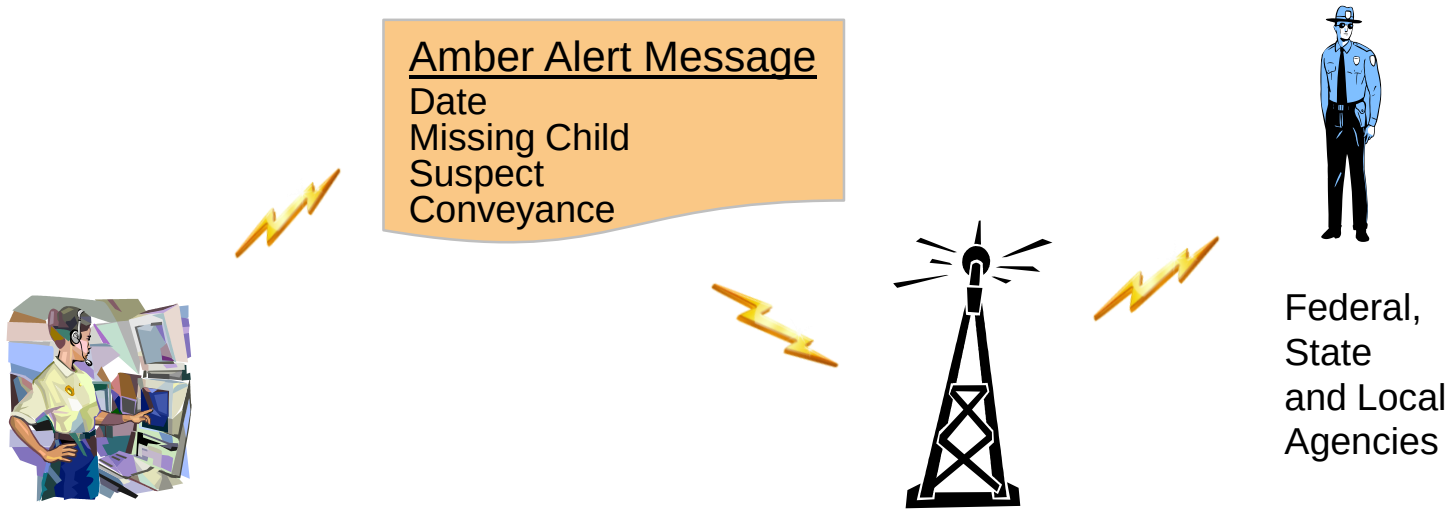


1.2 NIEM is NOT

- **Meant for modeling persistent data**
- **Does not have a standard message format**
- **An implementation specification**
- **Adopters of NIEM are not automatically interoperable**

1.2 NIEM Use Case Example

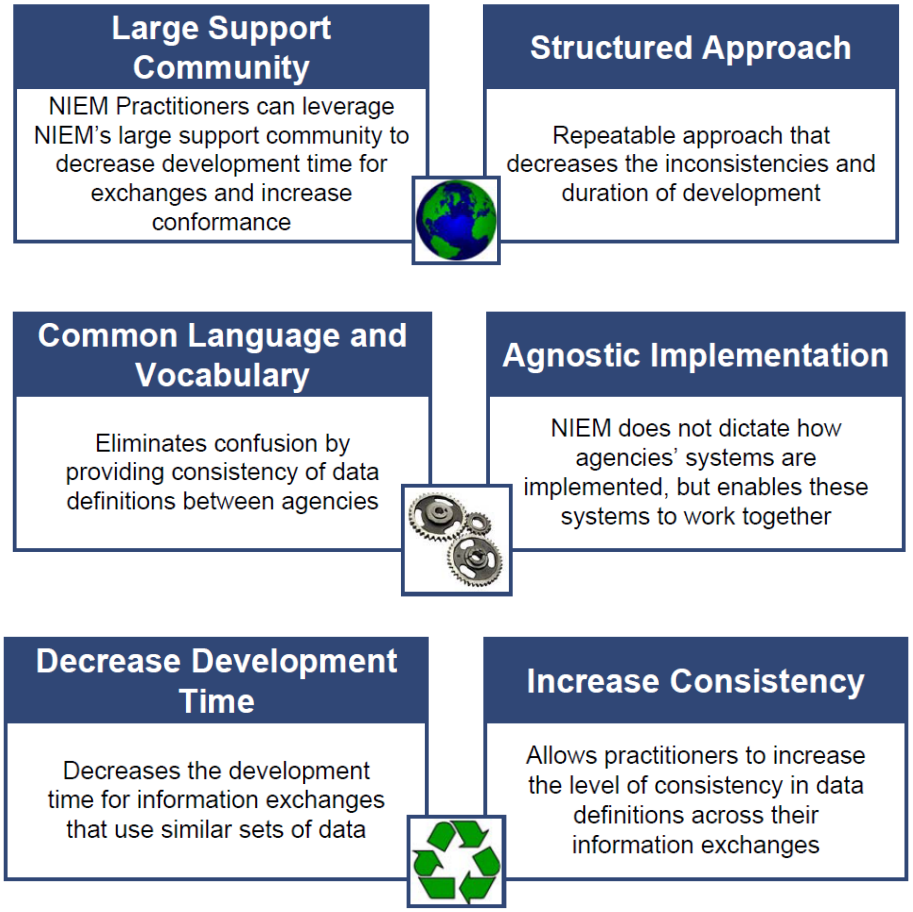




- **Amber Alert IEPD at** http://it.ojp.gov/default.aspx?area=implementationAssistance&page=1017&standard=456

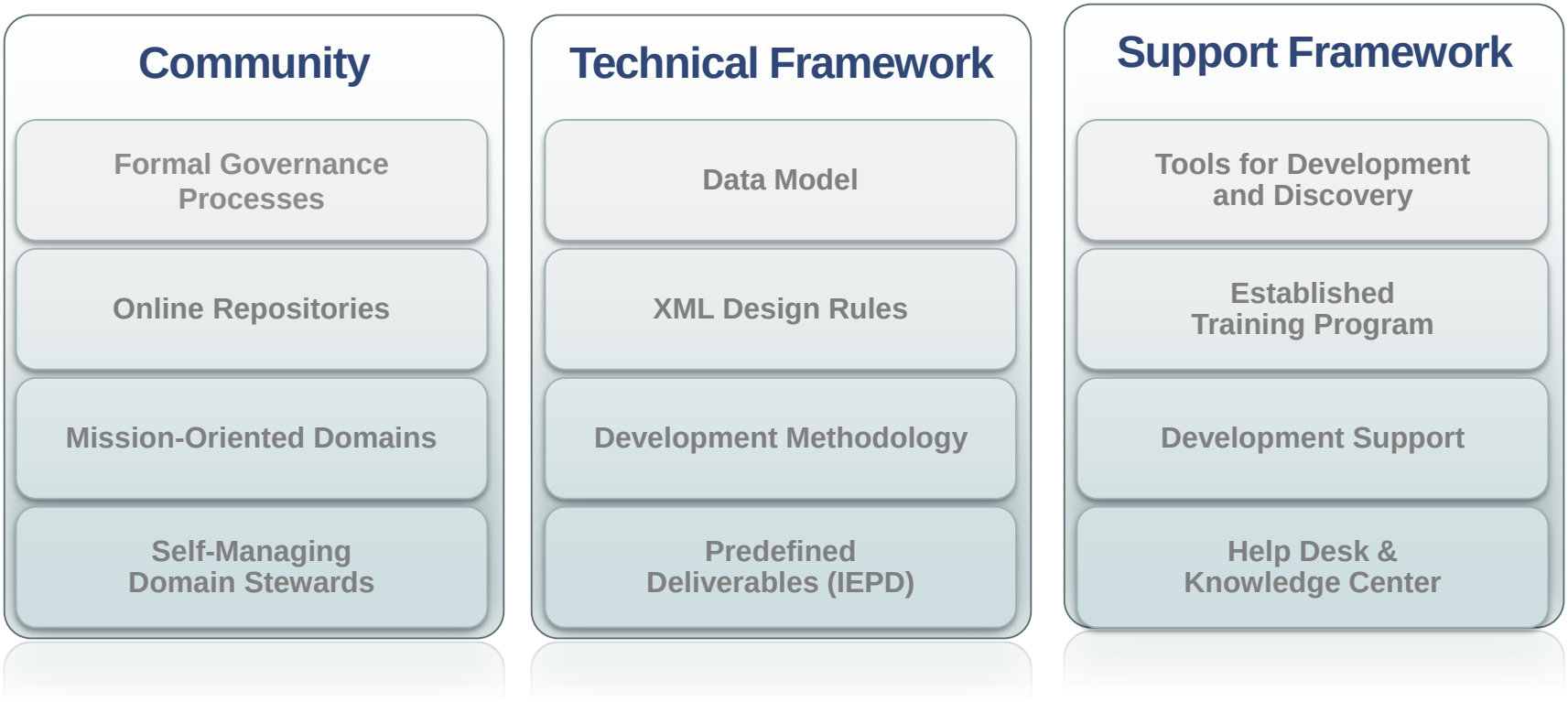
1.2 NIEM Value Proposition

- **Organizations with vastly different IT systems and data models can share information with ease, as a result of NIEM's:**
  - Standardization
  - Interoperability
  - Reusability



1.2 The NIEM Framework

- **NIEM is much more than a data model. NIEM offers an active user community as well as a technical and support framework**



1.2 NIEM Roles

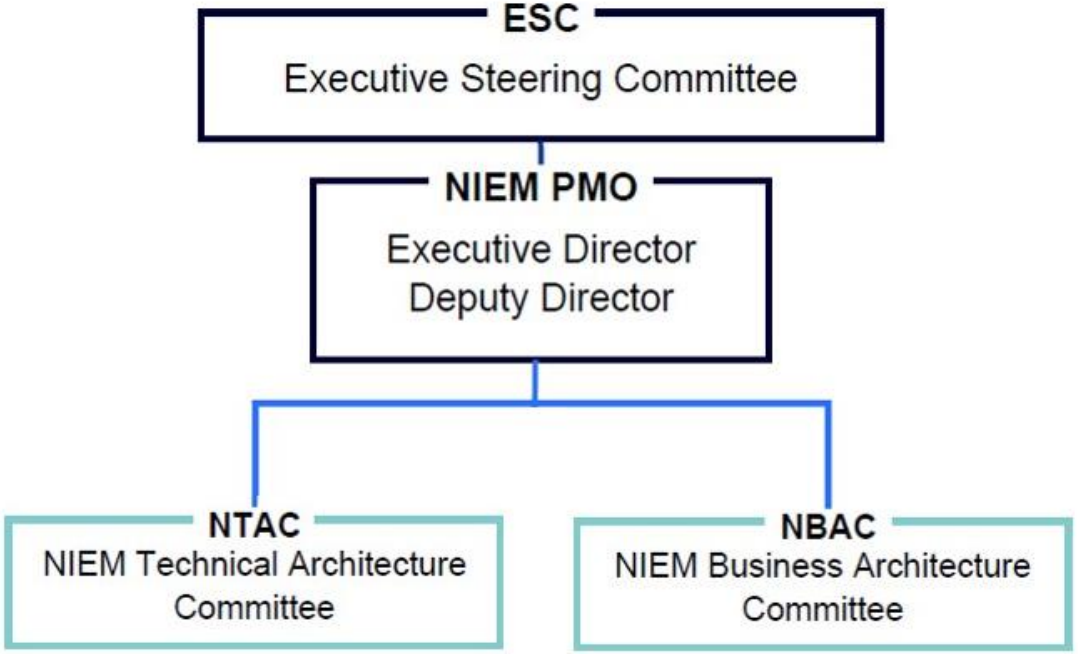
- **There are many different roles in the NIEM world:**
  - **Domain Steward** – creates, manages, and updates their community's NIEM data model
  - **Data Consumer** – discovers data or implements an information exchange based on a published IEPD
  - **Developer** – develops and publishes a NIEM IEPD
  - **Project Manager** – ensures their project is conformant to NIEM standards
  - **Executive Manager** – promotes standardized information sharing and the adoption of NIEM throughout their organization
  - **Enterprise Architect** – enforces policy and/or manages data assets and exchanges

2 – NIEM Community

2.1 Formal Governance Processes

2.1 - NIEM Governance Bodies

- **NIEM's governing structure is comprised of Federal, State, Local, Tribal and private organizations**
- **NIEM is jointly managed at an executive level by the Department of Homeland Security (DHS), the Department of Justice (DOJ) and Health and Human Service (HHS)**



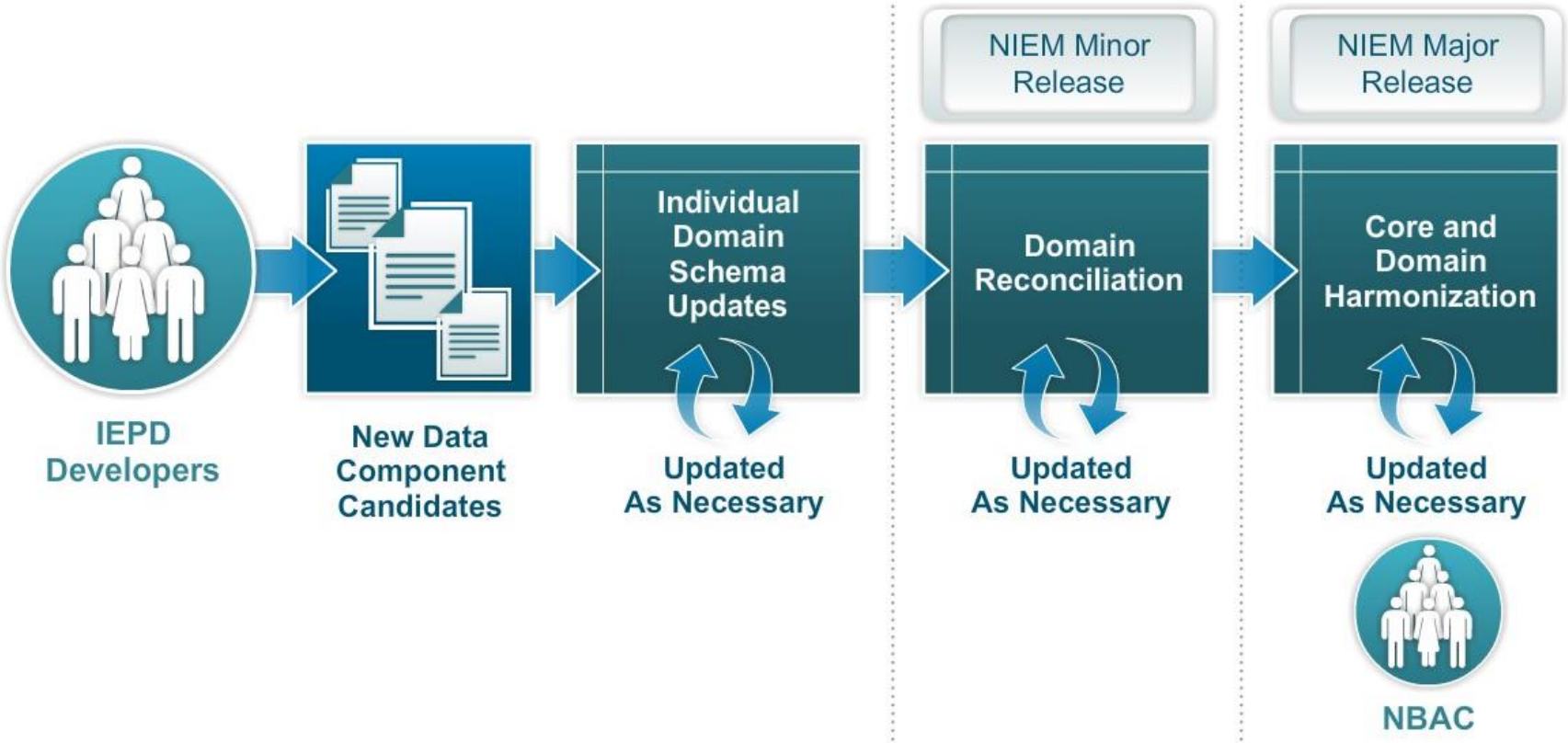
2.1 - NIEM ESC

- **In addition the executive sponsors, represented by the CIOs of DHS, DOJ and HHS, the ESC also includes following stakeholders:**
  - Global Justice Information Sharing Initiative (Global)
  - the National Association of State Chief Information Officers (NASCIO)
  - the Executive Office of the President Office of Management and Budget (OMB) Federal Enterprise Architecture (FEA) through the Chief Architect
  - the Office of the Director of National Intelligence (ODNI) through the Program Manager of the Information Sharing Environment (PM-ISE)

2.1 - NIEM NBAC and NTAC

- **NBAC**
  - Advises and supports the NIEM PMO on operational and business issues associated with NIEM development and implementation
  - Is comprised of the NIEM domain stewards; meets monthly; semi annual face-to-face meetings
- **NTAC**
  - Works to ensure the effective development of the NIEM core structure, technical architecture, and processes to support NIEM

2.1 - Formal Release Process



2 – NIEM Community

2.2 Online IEPD Repositories

2.2 - Online IEPD Repositories

- **IEPD reuse is enabled by online IEPD repositories:**
  - IEPD Clearinghouse at NIEM.gov/ojpiepdclearinghouse
    - Publically available
    - Registry; contains links to IEPDs, IEPDs are not stored
  - DHS Data Architecture Repository (DAR)
    - Restricted access
    - Contains DHS data assets, business processes, and services that are available to Information Sharing Environment (ISE) users
  - NIEM.gov Online Repository at tools.niem.gov/niemtools/iepdt/index.iepd
    - Publically available
    - Maintained by Georgia Tech Research Institute (GTRI), which provides technical support for NIEM

2 – NIEM Community

2.3 Mission Oriented Domains

2.3 - NIEM Domains

EMERGING DOMAINS

NNIEM Agriculture Domain

NIEM Cyber Domain

NIEM Government Resource Management Domain

NIEM Health Domain

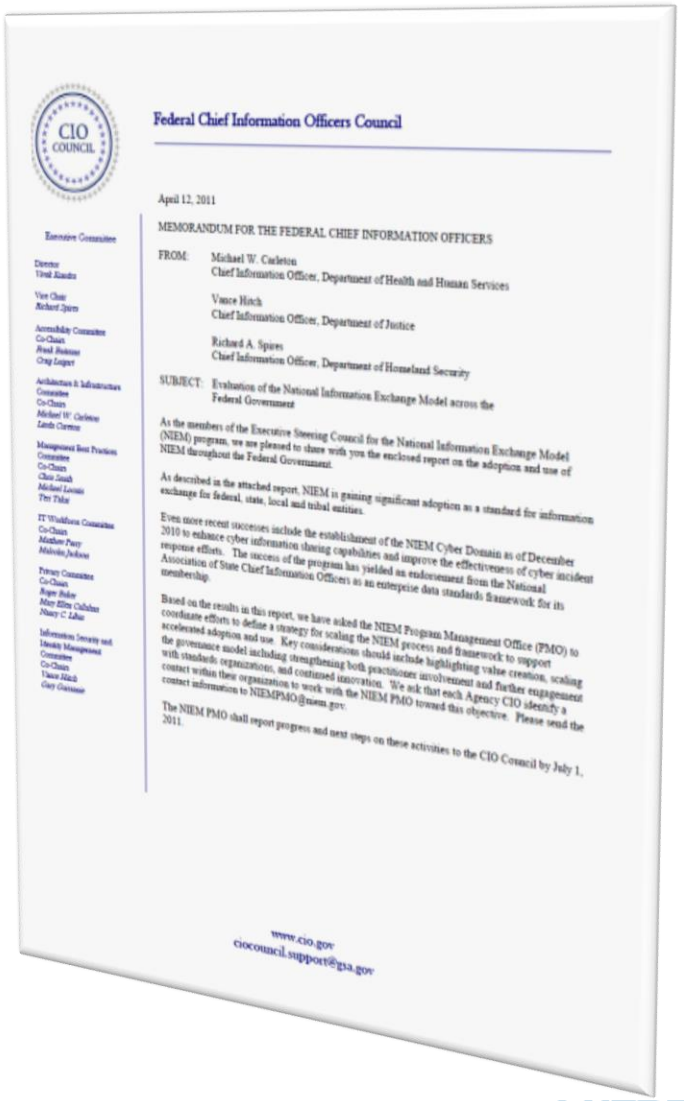
NIEM Human Services Domain

2.3 - Communities of Interest

- **A community of interest, or COI, is a group of people who share a common concern, set of problems, or interest in a topic. Within the context of NIEM, COIs come together based on a common need to exchange information in order to advance their missions**
- **NIEM domains are COIs, that are formally established, with an executive steward, to officially manage and govern a portion of the NIEM data model**
- **COIs can also be composed of multiple NIEM domains or can be a sub-set of a single NIEM domain**
  - Human Trafficking – Justice, Human Services, and Immigration domains
  - Maritime Domain – Coastal Defense, Marine Protection, and Fisheries COIs

2.3 - State of NIEM Adoption

AGENCY	USE OF NIEM	
Department of Agriculture	Committed to Use	
Department of Defense	Committed to Use	
Department of Education	Committed to Use	
Department of Energy	Committed to Use	
Department of Health and Human Services	Committed to Use	
Department of Homeland Security	Committed to Use	
Department of Housing and Urban Development	Committed to Use	
Department of Justice	Committed to Use	
Department of Labor	Committed to Use	
Department of State	Committed to Use	
Department of the Interior	Committed to Use	
Department of the Treasury	Committed to Use	
Department of Transportation	Committed to Use	
Department of Veterans Affairs	Committed to Use	
Environmental Protection Agency	Further Evaluation Required	
General Services Administration	Committed to Use	
National Aeronautics and Space Administration	Further Evaluation Required	
National Archives and Records Administration	Committed to Use	
National Science Foundation	Committed to Use	
Nuclear Regulatory Commission	Will Not Use	
Office of the Director of National Intelligence	Committed to Use	
Social Security Administration	Further Evaluation Required	
Geospatial Line of Business	Will Not Use	
Grants Management Line of Business	Further Evaluation Required	
Financial Management Line of Business	Committed to Use	
Human Resources Line of Business	Committed to Use	



CIO COUNCIL

Federal Chief Information Officers Council

April 12, 2011

MEMORANDUM FOR THE FEDERAL CHIEF INFORMATION OFFICERS

FROM: Michael W. Carleton
Chief Information Officer, Department of Health and Human Services

Vance Hitch
Chief Information Officer, Department of Justice

Richard A. Spires
Chief Information Officer, Department of Homeland Security

SUBJECT: Evaluation of the National Information Exchange Model across the Federal Government

As the members of the Executive Steering Council for the National Information Exchange Model (NIEM) program, we are pleased to share with you the enclosed report on the adoption and use of NIEM throughout the Federal Government.

As described in the attached report, NIEM is gaining significant adoption as a standard for information exchange for federal, state, local and tribal entities.

Even more recent successes include the establishment of the NIEM Cyber Domain as of December 2010 to enhance cyber information sharing capabilities and improve the effectiveness of cyber incident response efforts. The success of the program has yielded an endorsement from the National Association of State Chief Information Officers as an enterprise data standards framework for its membership.

Based on the results in this report, we have asked the NIEM Program Management Office (PMO) to coordinate efforts to define a strategy for scaling the NIEM process and framework to support accelerated adoption and use. Key considerations should include highlighting value creation, scaling the governance model including strengthening both practitioner involvement and further engagement with standards organizations, and continued innovation. We ask that each Agency CIO identify a contact within their organization to work with the NIEM PMO toward this objective. Please send the contact information to NIEMPMO@niem.gov.

The NIEM PMO shall report progress and next steps on these activities to the CIO Council by July 1, 2011.

www.cio.gov
ciocouncil.support@gsa.gov

MITRE

2.3 - NIEM as a Requirement

- **Department of Justice (DOJ)**
  - The DOJ CIO issued a memorandum in 2007 to all DOJ Component CIOs requiring the use of NIEM for all information exchanges
- **Department of Homeland Security (DHS)**
  - DHS requires all new information exchanges that cross organizational boundaries use NIEM According to the System engineering Life Cycle (SELC) and DHS Service Oriented Architecture (SOA) documentation
- **Department of Defense (DOD)**
  - The Maritime Domain Awareness Architecture Management Hub Strategy calls for NIEM to be used in information exchanges involving maritime (U.S. Navy) information
  - The DOD CIO issued memorandums in spring 2013 stating that the DoD will adopt the NIEM as the best suited option for standards-based data exchanges and establishing the NIEM Military Operations (MilOps) domain

2.3 – MITRE NIEM Support

- **DoD/ Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L)**
  - NIEM MilOps Domain management; NIEM acquisition guidance; NIEM analysis and advice
- **DoD/Office of the Chief Information Officer (OCIO)**
  - NIEM IEPD development; Information Sharing strategic guidance assessment; Federal chair for the NIEM Technical Architecture Committee (NTAC)
- **DOD Executive Agent for Maritime Domain Awareness**
  - Maritime Domain management; IEPD/Enterprise Information Exchange Model development; Information Sharing Strategy and system development
- **DHS Science and Technology Directorate (S&T) First Responders Groups (FRG)**
  - NIEM assessment; IEPD development
- **DHS/Transportation Security Administration (TSA)**
  - Information Sharing Strategy development
- **DHS/U.S. Citizenship & Immigration Services (USCIS)**
  - Information Sharing Strategy development; Immigration Domain management; NIEM information exchange assessments
- **DHS/National Protection and Programs Directorate (NPPD)**
  - Cyber Security Domain development
- **DHS/Customs & Border Protection (CBP)**
  - IEPD development and reviews
- **DHS/Federal Emergency Management Agency (FEMA)**
  - Emergency Management Domain management
- **Office of the Director of Naval Intelligence (ODNI)/Chief Information Officer (CIO)**
  - Review of NIEM Governance and NIEM Technology
- **Program Manager for the Information Sharing Environment (PM-ISE)**
  - Suspicious Activity Report IEPD development
- **DHS/Immigration & Customs Enforcement (ICE)**
  - Review of Law Enforcement Information Sharing Standards (LEXS)

2 – NIEM Community

2.4 Self Managing Domain Stewards

2.4 - NIEM Domain Stewards

- **Domain stewards are community members that are responsible for actively managing and updating their community's NIEM data model**

Domain	Executive Steward
Justice	Global Justice (State & Local)
Screening	DHS Screening Coordination Office
Immigration	DHS/ICE & USCIS
Chemical, Biological, Radiological, Nuclear	DHS/DNDO
Maritime	DOD/DON/MDA
Cyber	DHS/NPPD/CS&C
Children, Youth, and Family Services	HHS/ACFS & DOJ
Emergency Management	DHS/FEMA, DHS/S&T (State & Local)
Infrastructure Protection	DHS/NPPD
International Trade	DHS/CBP
Biometrics	DHS/NPPD, DOJ/FBI, DOD, NIST
Health	HHS/ONC & HHS/OCIO
Human Services	HHS/ACFS & HHS/ONC
Military Operations	DoD/Joint Staff J6
Government Resource Management	GSA

2 – NIEM Community

2.5 Communications

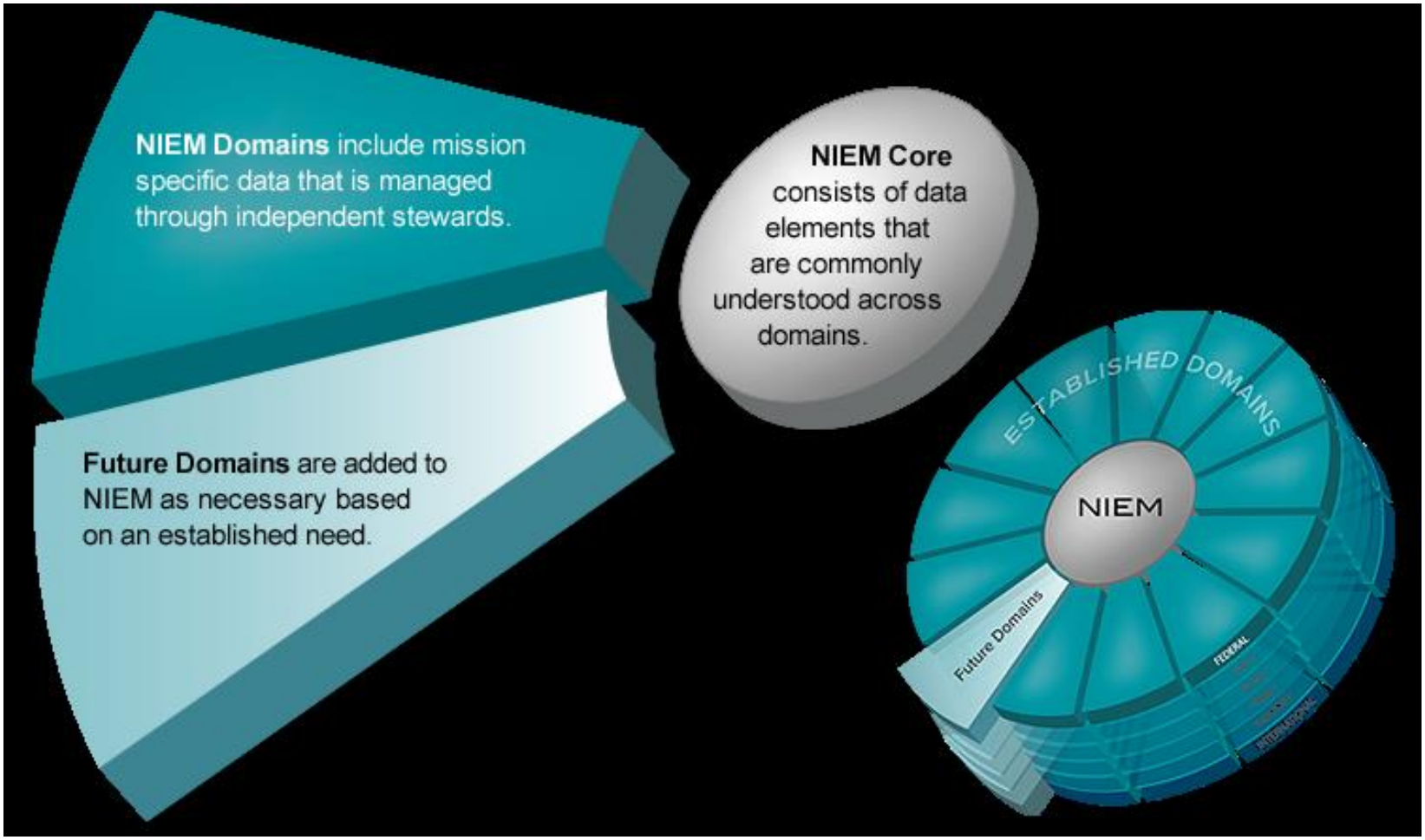
2.5 - NIEM Communication Channels

- **NIEM Website at** www.NIEM.gov
  - Announcements and News
  - Domain & Community Collaboration Zones
- **NIEM Social Media Outlets**
  - LinkedIn at www.linkedin.com/groups?gid=1903175
  - Twitter at www.twitter.com/NIEMExecDir
  - YouTube at www.YouTube.com/NIEMConnects
- **NIEM Meetings**
  - NIEM Town Hall
  - Governance Committee Meetings
- **NIEM Email**
  - Sign up on www.NIEM.gov

3 – NIEM Technical Framework

3.1 Data / Reference Model

3.1 - NIEM Technical Architecture



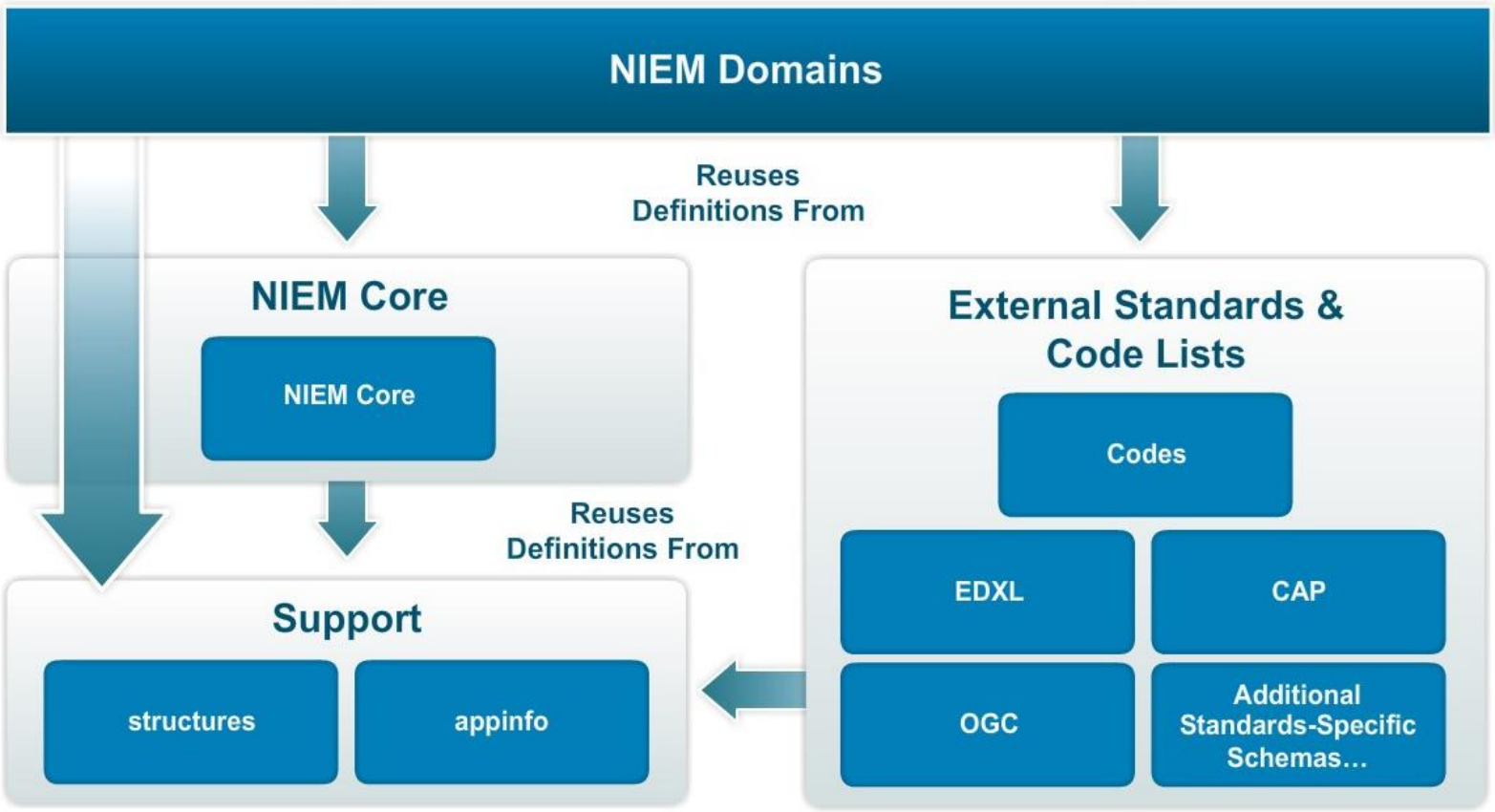
MITRE

3.1 - NIEM Data Model

- **The NIEM data model is a set of common, approved XML data elements, organized into core and domain-specific components:**
  - Core components are used by multiple domains and can be described by structure, semantics, and definition universally (e.g. Person)
  - Domain-specific components are updated by subject matter experts (SMEs) who are NIEM practitioners and industry experts for their particular domain (e.g. Immigration Benefit)
- **The schemas that comprise NIEM are called Reference Schemas, as they are used as a reference when building XML schemas for information exchanges.**

3.1 - Abstraction Layers

- **The schemas in NIEM are grouped into abstraction layers, with each layer reusing and extending data elements from previous layers**



3.1 - NIEM Core Components

- **Some important, practical NIEM Core components**

<nc:Person>
<personSexCode>
<personBirthDate>
<personEyeColorText>
<personHairColorText>
...

Has the most fields

<nc:Activity>
<activityDate>
<activityCategoryText>
<activityDescriptionText>
<activityDisposition>
...

The most often derived component

<nc:Item>
<itemName>
<itemDescriptionText>
<itemConditionText>
<itemValue>
...

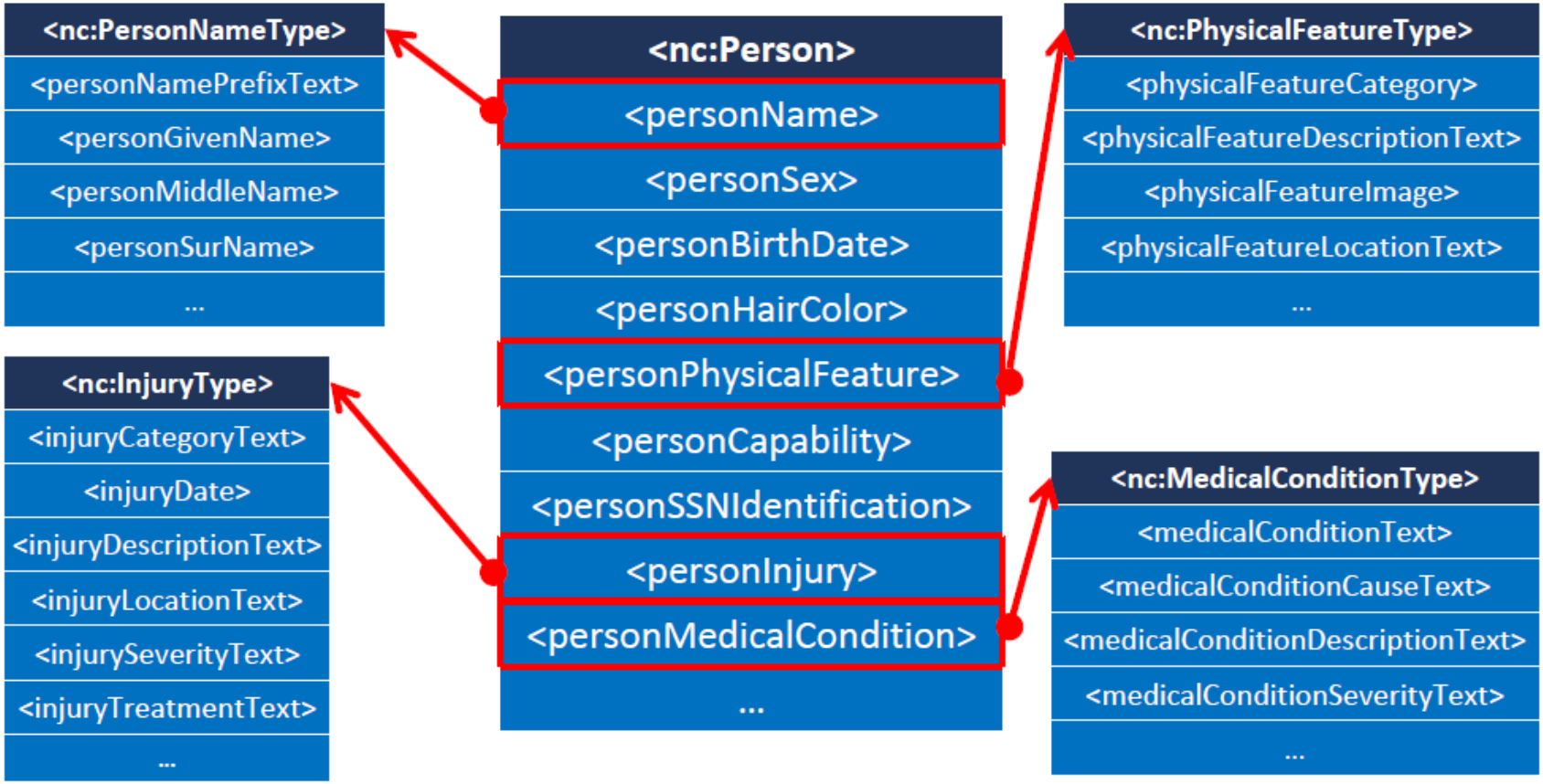
Has the deepest inheritance chain

<nc:Identification>
<identificationID>
<identificationJurisdictionText>
<identificationEffectiveDate>
<identificationStatus>
...

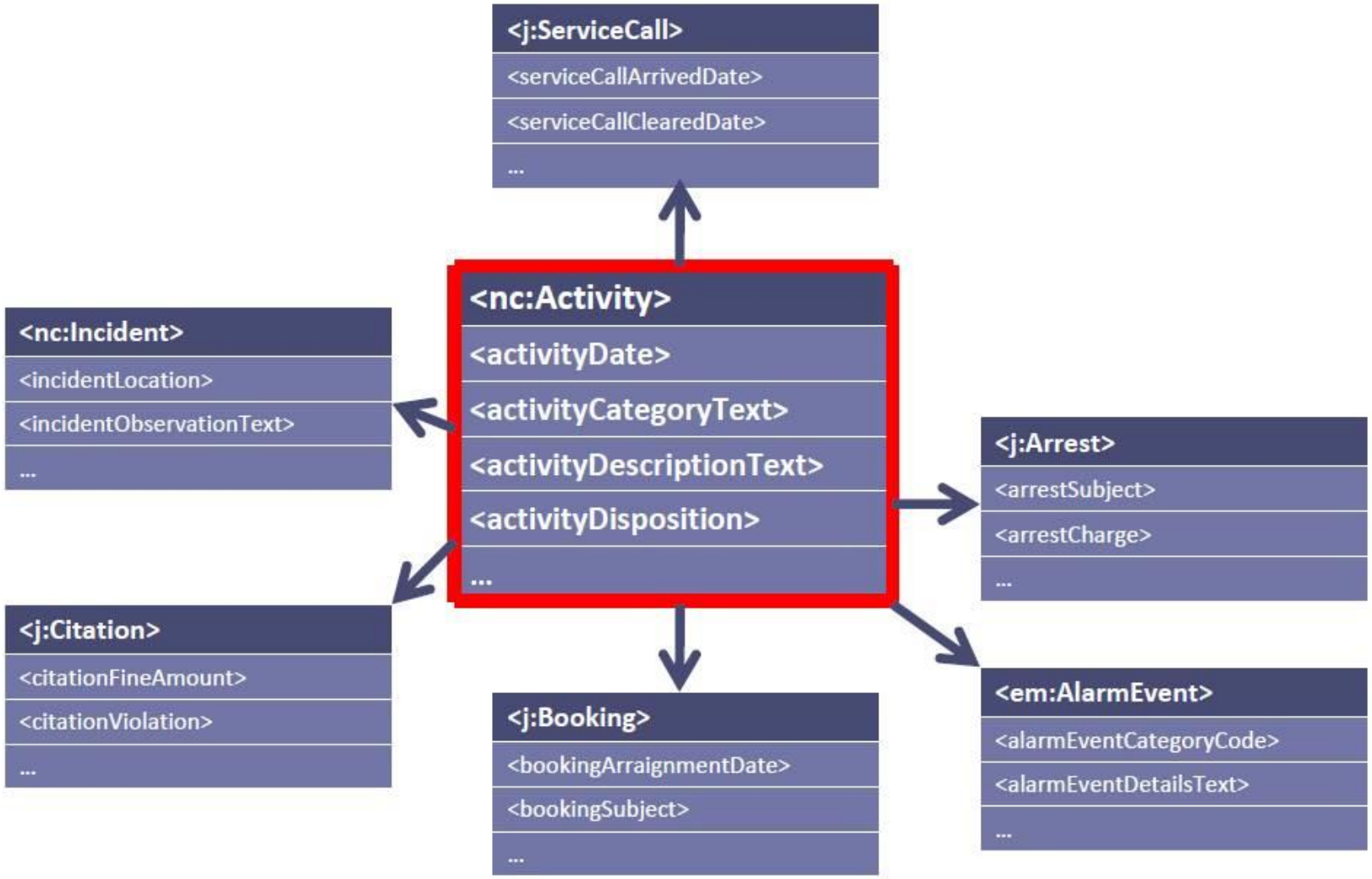
<nc:Location>
<locationDescriptionText>
<locationAddress>
<locationCategoryCode>
<locationName>
...

<nc:Organization>
<organizationName>
<organizationDescriptionText>
<organizationCategoryText>
<organizationEstablishedDate>
...

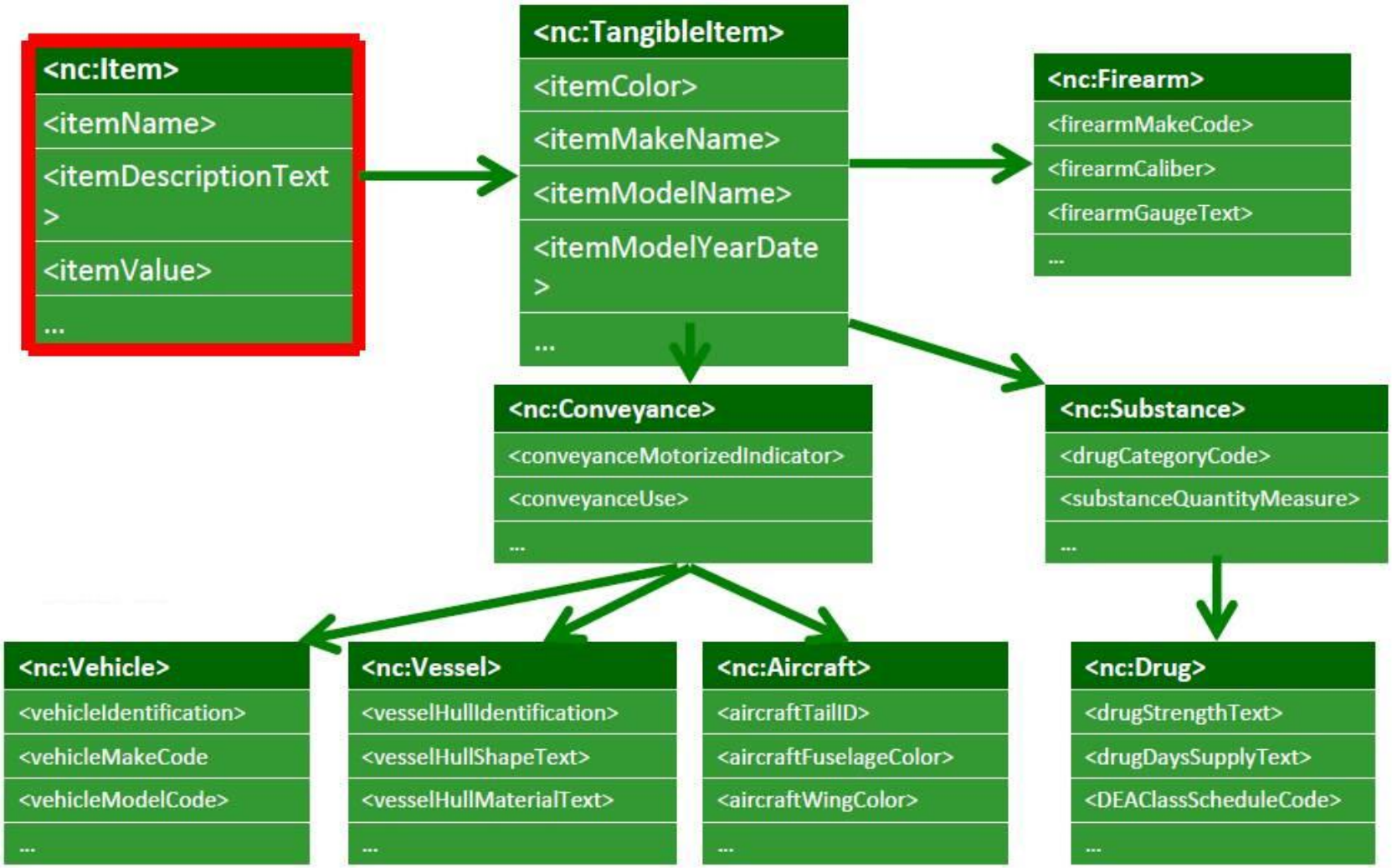
3.1 NIEM Core Component <nc:Person>



3.1 NIEM Core Component <nc:Activity>



3.1 NIEM Core Component <nc:Item>



3 – NIEM Technical Framework

Exercise #1 - NIEM Model

3 – NIEM Technical Framework

3.2 XML Design Rules

3.2 NIEM Naming and Design Rules

- **The NIEM Naming and Design Rules (NDR) is a normative specification of how the Core and domain-specific components of the NIEM Data Model are defined and utilized**
- **The NIEM NDR is based on industry standard W3C XML guidelines, and provides technical guidance for NIEM-conformant XML schema and instance development**
- **The NIEM NDR defines the rules for:**
  - Using XML Schema constructs in NIEM
  - Modeling and structuring NIEM-conformant Schemas
  - Creating NIEM-conformant XML schemas
  - Naming and defining NIEM XML elements and types
  - Extending NIEM-conformant data objects
  - Integrating standards defined externally to NIEM

3.2 NDR Alignment with Industry Standards

- **NIEM, through the NDR, aligns to two existing industry standards**

3 – NIEM Technical Framework

3.3 Development Methodology

3.3 IEPD Lifecycle

- **The IEPD lifecycle defines the IEPD development process and associated artifacts.**

Scenario Planning	Review background, assess resource impact, understand business context, and identify information exchange business scenarios.
Analyze Requirements	Selected information exchange scenario is further elaborated to understand and document the business context and data requirements.
Map & Model	Create an Exchange Content Model based on information exchange requirements. The Exchange Content Model is then mapped to NIEM.
Build & Validate	Create a set of exchange-specific NIEM-conformant XML Schemas that implement the Exchange Content Model created for the exchange.
Assemble & Document	Prepare and package all related files for the IEPD into a single self-contained, self-documented, portable archive file.
Publish & Implement	Implement the IEPD into production as well as publish the IEPD for search, discovery, and reuse.

3.3 IEPDs and the NIEM Architecture

3 – NIEM Technical Framework

3.4 Predefined Deliverables (IEPD)

3.2 Information Package Exchange Documentation (IEPD)

- **Describes the specific information exchanged between a sender and a receiver**
- **Core functions of an IEPD:**
  - Developed to provide the business, functional, and technical details of the information exchange through predefined artifacts
  - Created with a core set of artifacts in a prescribed format and organizational structure to allow for consistency
  - Designed to be shared and reused in the development on new information exchanges through the publication in IEPD repositories

3.2 IEPDs Do NOT:

- **Specify how exchange data is physically transferred between organizations or systems**
- **Describe an interface or Interface Control Document (ICD)**
- **Specify any technical information outside of the message structure**

3.4 IEPD Artifacts

- **IEPDs contain both required and optional, but recommended, artifacts.**

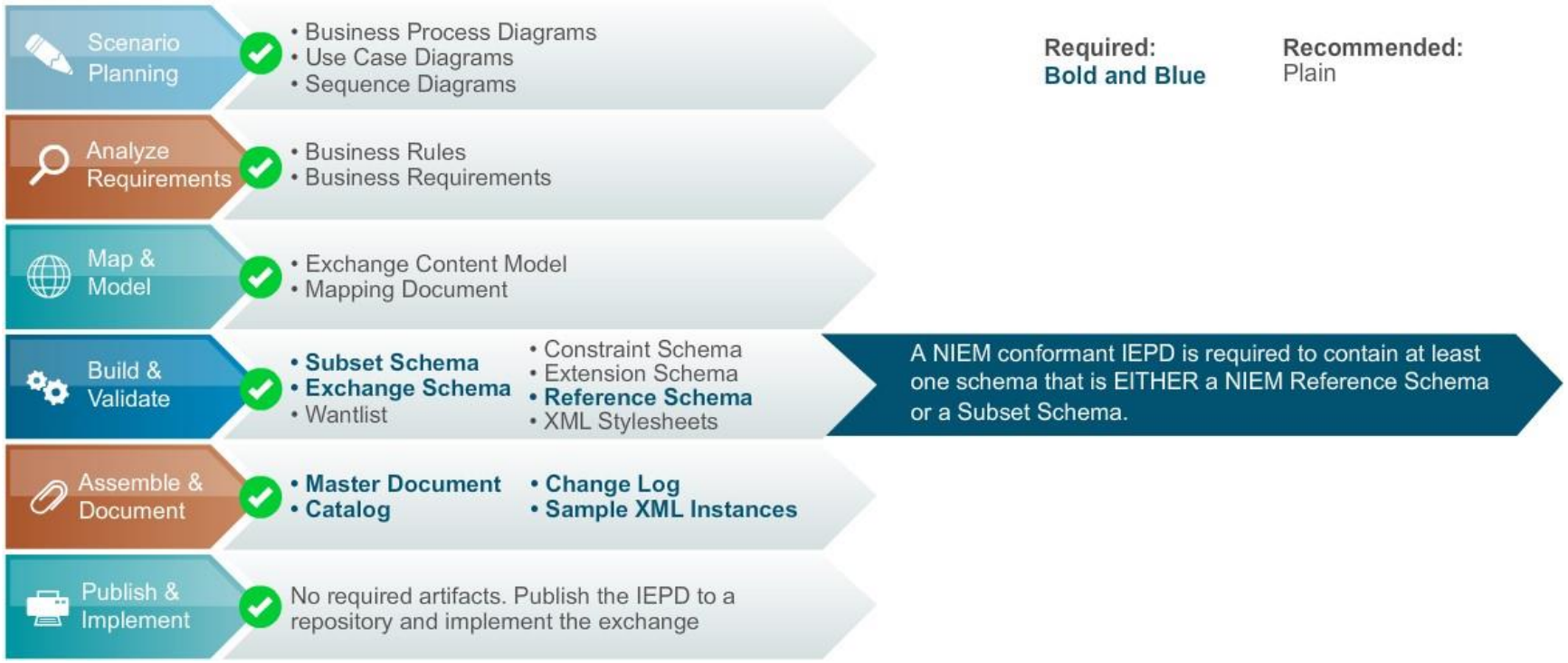
	Required Artifacts	Optional Artifacts
Exchange Files	Subset Schema Exchange Schema Sample XML Instance Reference Schema	Constraint Schema Extension Schema Stylesheet Wantlist
Models	None Required	Exchange Content Model Use Case Diagram Business Process Diagram Sequence Diagram
Documentation	Master Document Change Log Catalog	Business Rules Business Requirements Mapping Document

4 – IEPD Development and Implementation

4.1 IEPD Lifecycle

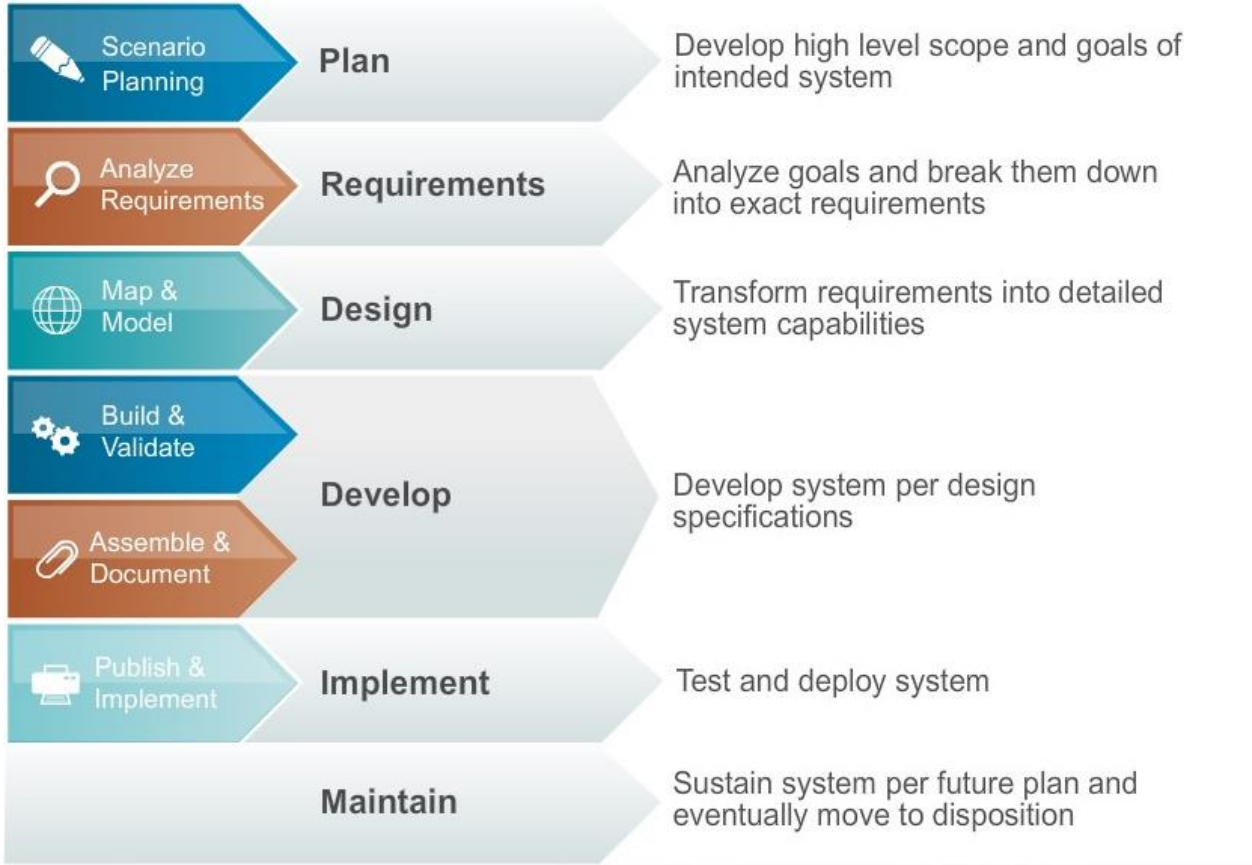
4.1 IEPD Lifecycle Phases and Artifacts

- **Artifacts are produced throughout the IEPD Lifecycle**



4.1 IEPD Lifecycle Integration with System Development Lifecycle

- **The IEPD lifecycle integrates closely with the System Development Lifecycle (SDLC)**



4 – IEPD Development and Implementation

4.2 Scenario Planning and Analyze Requirements

4.2 Scenario Planning

- **Business scenarios document how the information exchange occurs and can be used to:**
  - Depict current and future state environments
  - Perform gap analysis and identify roadblocks to development
  - Initiate changes to existing business processes to increase efficiency and cost avoidance within information exchanges
  - Establish a business case for the information exchange

4.2 Analyze Requirements

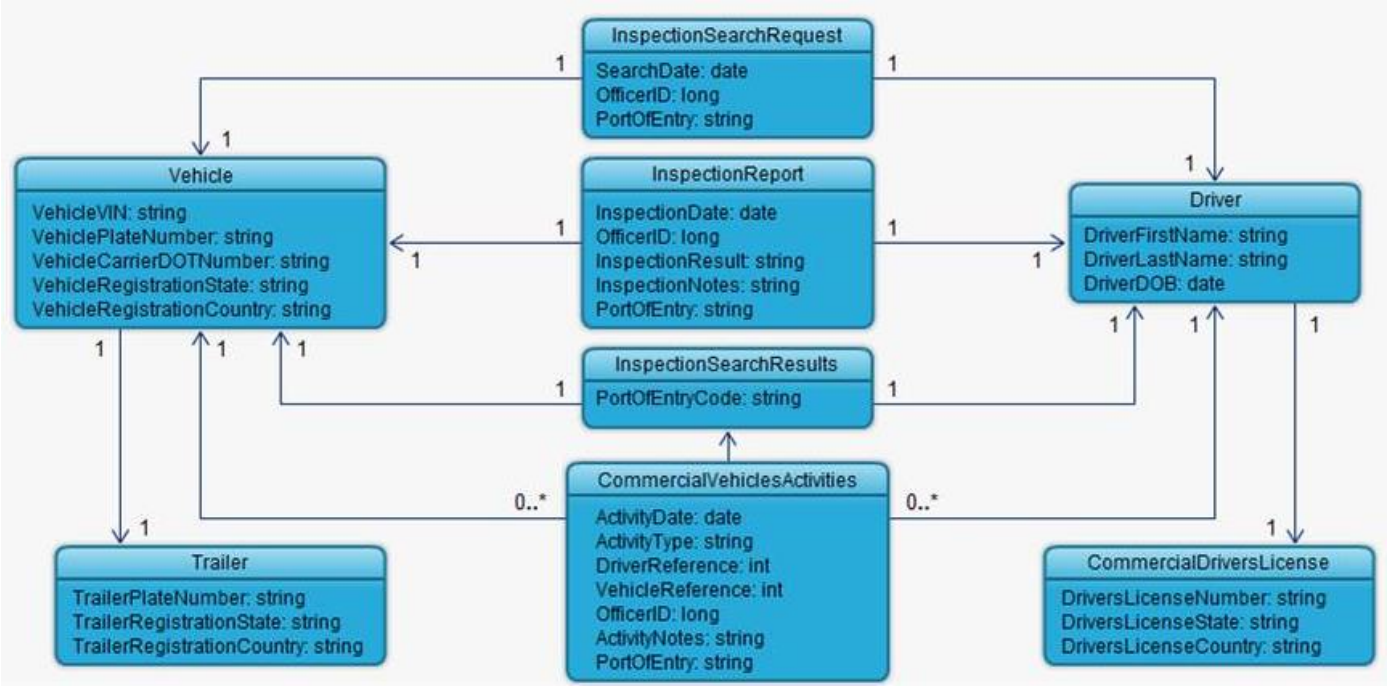
- **During the Analyze Requirements phase, the following are defined:**
  - **Business Requirement:** a business driver for an information exchange that is primarily a functional or operational requirement
  - **Business Rule:** a specific qualification for data that usually refers to how the data in an IEPD should be structured, including field lengths, data validation, etc.

4 – IEPD Development and Implementation

4.3 Map and Model

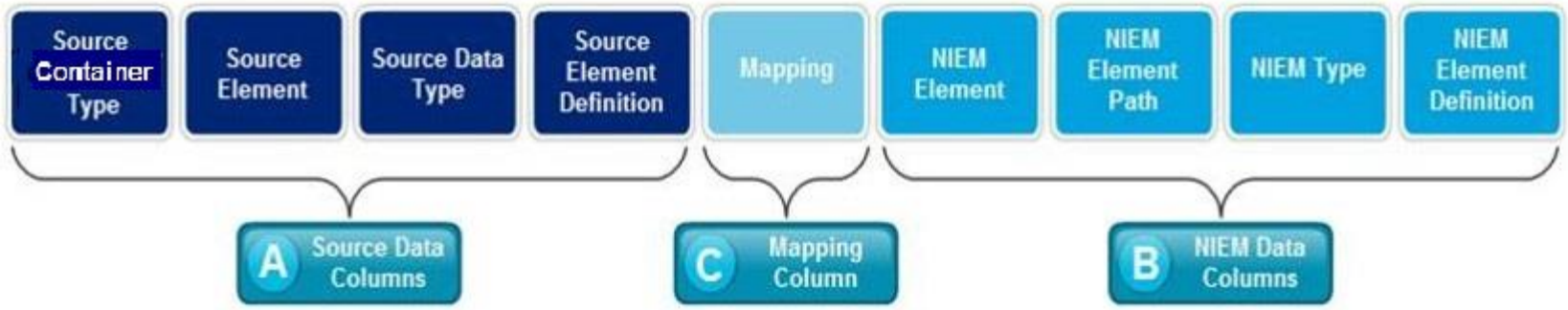
4.3 Exchange Content Models

- **Exchange Content Models are used as a communication device to reach agreement on the content and structure of an information exchange**
- **Exchange Content Models consist of objects, their related elements, and the associations between those objects**



4.3 Mapping Document

- **A Mapping Document is a standardized document used to identify how exchange data aligns to, or "maps", and reuses NIEM data objects**
- **A mapping document is:**
  - Is commonly referred to as Component Mapping Template (CMT)
  - Demonstrates how data objects in an exchange map to data objects in NIEM by recording the degree of similarity
  - Aids in the identification of XML objects that are not currently in NIEM and are candidates for inclusion in an extension schema, and possibly a future NIEM release



4.3 Searching the NIEM Model

- **The NIEM Model can be searched using a variety of methods**

Search Method	Explanation	Example
Name Variations	Searching for variations of a name can often yield results	Search for *Officer* instead of *Official* to yield **j:EnforcementOfficial**
Conceptual Meaning	Search for words that could be in the definition of the data object	Search for *Modified Charge* to yield **j:AmendedCharge**
Synonyms	Synonyms of the data object to find exactly what you are looking for	Search for *Facility* instead of *Building* to get different results
Containers	Use a more abstract term to find containers of the data objects	Search for *Person* instead of *Person Arrest* to get the maximum number of results

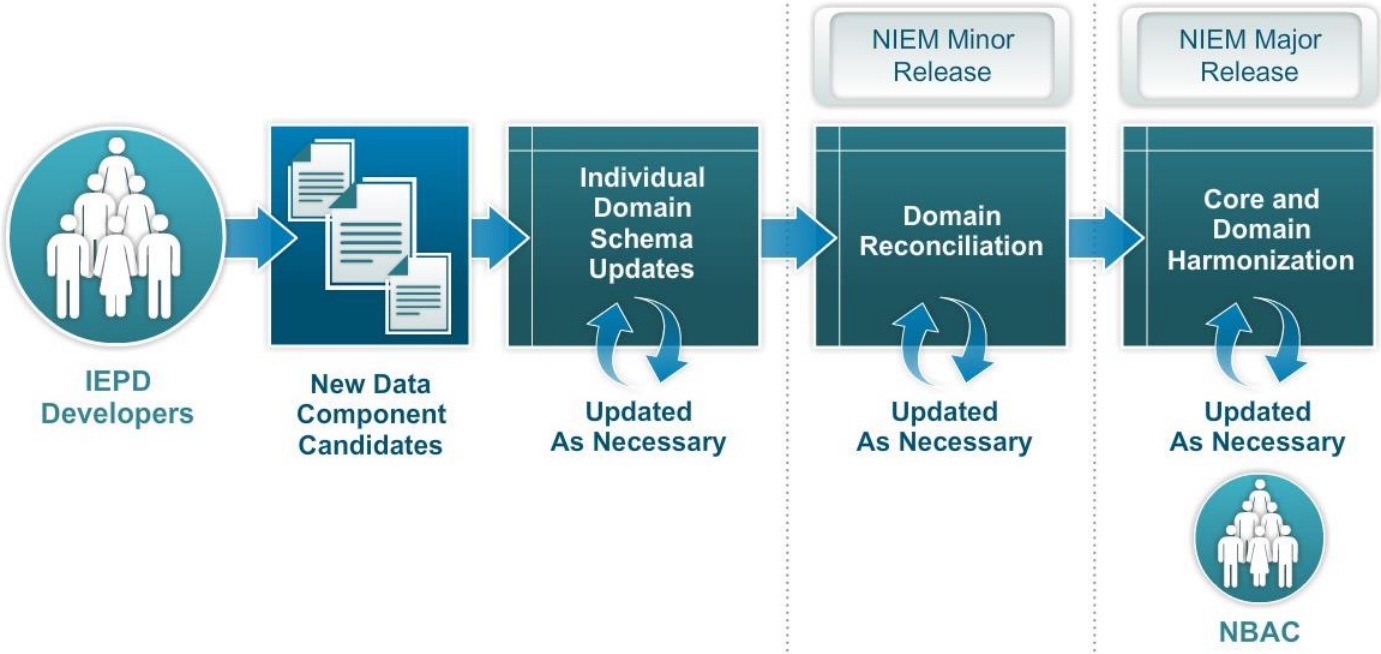
4.3 Types of Matches

- **Exchange data objects can map to NIEM data objects as follows:**
  - Equivalent Match – exact or almost exact semantics and structure
  - No Match – no equivalent NIEM data object
  - Partial Match – conflict in semantics or structure

Conflict Description	Example(s)	Mitigation
Semantic: Occurs when there is a small discrepancy in definition or name	• nc:Date does not align exactly with local-ns:EntryDate	Reuse the NIEM data type and create a local element
Structural: Occurs when the NIEM data object has constraints that disallow a direct mapping of the exchange data object	• Data type mismatches • Code lists (enumeration facets) do not have all necessary entries	Reuse the NIEM element and either create a new data type or extend a NIEM base type
Container: Occurs when an exchange data object hierarchy does not match the hierarchy of a desired NIEM data object	• Data object contains (or is contained within) elements or types that do not make logical sense or align well	Reuse the NIEM element and/or type but create local elements and/or types to contain them

4.3 Adding New Data Components to NIEM

- **New data components, created as a result of no matching NIEM data object, can be considered as candidates for a future NIEM release through the NIEM release harmonization process**
- **Harmonization reduces semantic overlap and logical overlap and increases the uniformity of data element definitions across all reference schemas**



4 – IEPD Development and Implementation

Exercise #2 – Mapping and Matching

4 – IEPD Development and Implementation

4.4 Build and Validate

4.4 IEPD XML Schemas

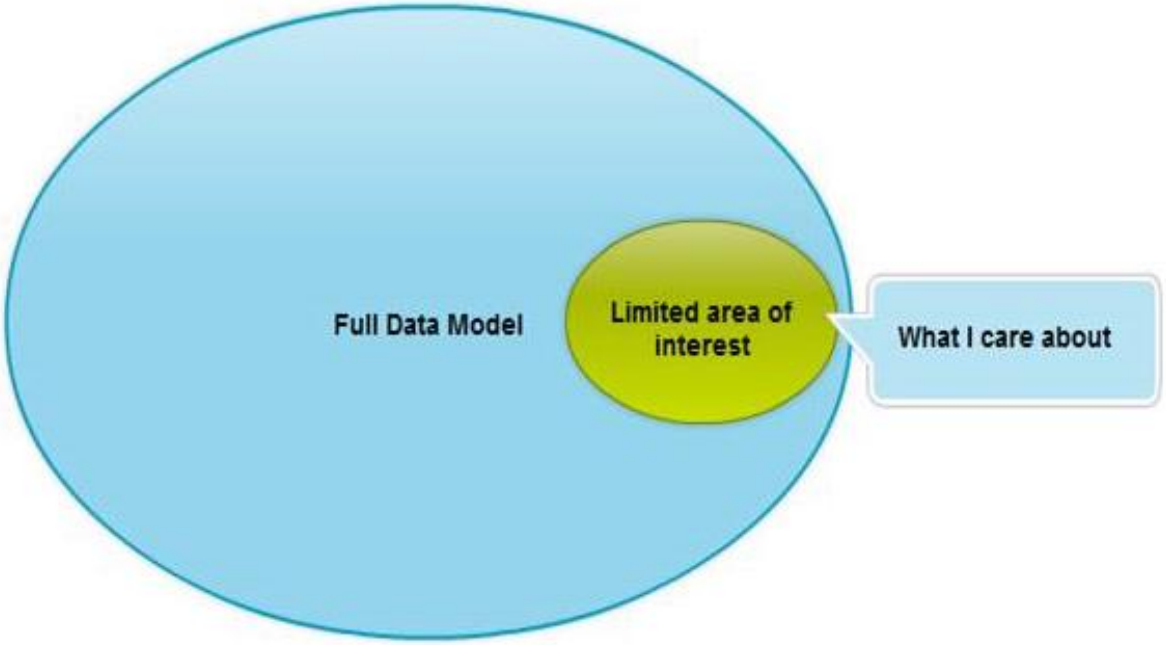
- **There are four XML schemas that are part of an IEPD that are based on the Mapping Document and will implement the Exchange Content Model**
  - Exchange Schema
  - Subset Schema
  - Extension Schema
  - Constraint Schema
- **The Subset and Extension Schemas are based on the Mapping Document values and will implement the Exchange Content Model**

4.4 Exchange Schema

- An Exchange Schema defines the root element and overall structure of the message, declares the namespaces, and imports the other XML Schemas (Subset, Extension, Constraint) used in the exchange
- Exchange Schemas are unique to the individual exchange and are not intended to be reused in other exchanges beyond providing a template for the structure and content of the new information exchange
- Used as an entry point for validation of an XML Instance

4.4 Subset Schema

- **A Subset Schema contains only the types and elements required for an exchange**
  - Smaller schemas are easier to validate, search, and trace through, and they work better with NIEM tools
  - Wantlists can be used to create Subset Schemas using NIEM tools



4.4 Extension Schema

- **An Extension Schema defines the data types and elements used by an exchange that extend but are not available within NIEM**
- **Data types and elements in an Extension Schemas are intended to be reusable in other exchanges**
- **Extension Schemas are optional**

4.4 Extension Creation

- **Extensions can be created in two ways**

Extend an existing NIEM type

1. Declare a new global type within the Extension Schema
2. Use a type from NIEM as a base <xsd:extension base="nc:VehicleType">
3. Create globally declared elements for any new content to be included in the extended type
4. Add references within the extended type to new content elements and existing NIEM elements to be included in the extended type

Create a new extension type

1. Declare a new global type within the Extension Schema
2. Use structures:ObjectType as a base <xsd:extension base="structures:ObjectType">
3. Create globally declared elements for any new content to be included in the new extension type
4. Add references within the new extension type to new content elements and existing NIEM elements to be included in the new extension type

4.4 Extension Use

- **Type extensions can be implemented in two ways**

Concrete Extension

- Involves creating a new type by extending an existing NIEM type to include additional elements
- In an instance, elements of this new type are now in a local namespace, along with higher level elements that contain them

Substitution

- Involves making a new type based on existing NIEM types – The new element is tied to the element to be replaced using a substitution group
- Extending NIEM substitution groups should only occur if the newly created element is semantically equivalent to the substitution group head element

4.4 Concrete Extension Example

nc:AssociationType		**A data type for an association, connection, relationship, or involvement somehow linking people, things, and/or activities together.**
nc:AssociationDateRange	nc:DateRangeType	A date range in which an association occurs.
nc:AssociationDescriptionText	nc:TextType	A description of an association.
nc:AssociationAugmentationPoint	<abstract element, no type>	An augmentation point for AssociationType.

scr:ManifestPersonAssociationType	extends nc:AssociationType	**A data type for a relationship for the Persons on a Manifest**
nc:Manifest	nc:ManifestType	A document containing information about persons, materials, cargo, and equipment on a conveyance.
nc:Person	nc:PersonType	A human being.
scr:ManifestPersonAssociationAugmentationPoint	<abstract element, no type>	An augmentation point for ManifestPersonAssociationType.

4.4 Substitution Example

nc:AddressType		**A data type for a geophysical location described by postal information.**
nc:LocationCountry	<abstract element, no type>	A data concept for a country, territory, dependency, or other such geopolitical subdivision of a location.
Substitutable Elements:		
+ nc:LocationCountryFIPS10-4Code	fips_10-4:CountryCodeType	A country, territory, dependency, or other such geopolitical subdivision of a location.
+ nc:LocationCountryISO3166Alpha2Code	iso_3166:CountryAlpha2CodeType	A country, territory, dependency, or other such geopolitical subdivision of a location.
+ nc:LocationCountryName	nc:ProperNameTextType	A name of a country, territory, dependency, or other such geopolitical subdivision of a location.
+ intel:LocationCountryFIPS10-4PlusNCTCCodeText	nc:TextType	A union of additional country codes managed by NCTC and the FIPS 10-4 country codes.
+ scr:LocationCountryIdentification	nc:IdentificationType	An identification value that represents a country.

4.4 Augmentation Point Example

- **Augmentation Points are new in NIEM 3.0**
- **Augmentation points use substitution to make augmentations less complex and somewhat more visible**

nc:LocationType		A data type for geospatial location.
nc:LocationAugmentationPoint	<abstract element, no type>	An augmentation point for LocationType.
Substitutable Elements:		
+ cbrn:SiteLocationAugmentation	cbrn:SiteLocationAugmentationType	Additional information about a site location.
+ em:LocationAugmentation	em:LocationAugmentationType	Additional information related to the location of the alarm.
+ geo:LocationFeature	geo:FeatureType	A GML feature that describes a location.
+ geo:LocationGeometry	geo:GeometryType	A GML geometry that describes a location.
+ im:LocationAugmentation	im:LocationAugmentationType	Additional information about a location.
+ intel:LocationAugmentation	intel:LocationAugmentationType	Additional information about a location.
+ j:LocationAugmentation	j:LocationAugmentationType	Additional information about a location.
+ m:LocationAugmentation	m:LocationAugmentationType	Additional information about a location.
+ scr:LocationAugmentation	scr:LocationAugmentationType	Additional information about a location.

scr:LocationAugmentationType		A data type that supplements Location and specifies additional information about a Screening location.
scr:BorderCodeText	nc:TextType	A text representing a code for a DHS Border location on the Northern and Southern borders of the US.
scr:PortOfEntryCodeText	nc:TextType	A text representing a code for a DHS organization location where a traveler or alien entered or departed the US.

4.4 Constraint Schema

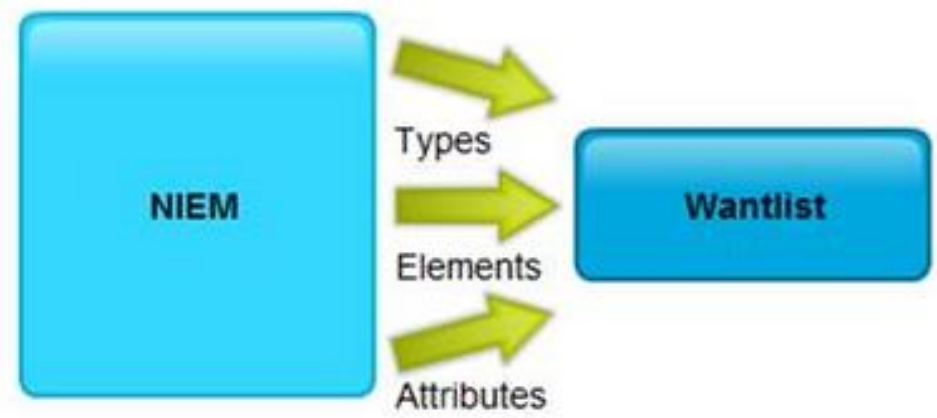
- **A Constraint Schema restricts the values, cardinality, and minimum/maximum length of data elements within an exchange**
- **Constraint Schemas are optional and do not have to be NIEM-conformant**
- **With NIEM 3.0, Constraint Schemas can still be used, but formal business rules (like Schematron) are the preferred technique.**
  - Because Constraint Schemas have no formal way, other than XSD, of representing the rule(s) they are intended to enforce, it is extremely difficult to understand what they were created to do without explicit explanations.

4.4 NIEM XML Artifacts

- **There are three NIEM XML artifacts that are part of an IEPD**
  - **Wantlist** – specifies the elements and types from NIEM that will be included in the Subset Schema for an exchange
  - **Sample XML Instances** – used as an example of an XML document that validates against the schemas defined for the exchange; the exchange's "payload"
  - **XML Stylesheet** – built using extensible Stylesheet Language (XSL or XSLT) and is used to display XML instances in human (or browser) readable form (optional)

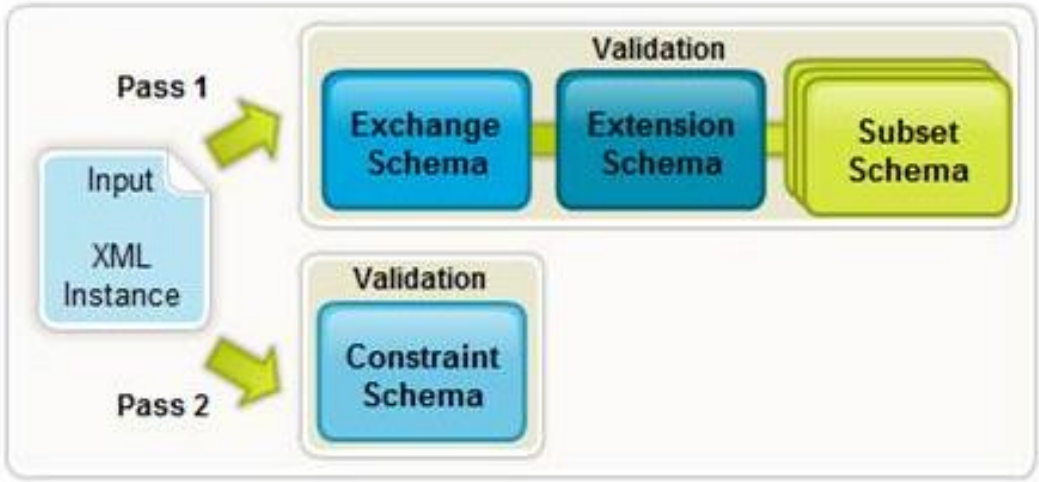
4.4 Wantlists

- **Wantlists:**
  - Do not contain any elements or types that are not already defined within NIEM
  - Can be created and loaded into a tool for automated subset schema generation



4.4 NIEM Instance Validation

- **Validation is the process for testing that an XML instance is well-formed and can be validated against NIEM-conformant schemas**
- **Validation of schema instances is required for NIEM-conformant IEPDs**
- **Instances are first validated for structure against the exchange, subset and extensions schemas, then against the constraint schema for the data values in the instance**



4.4 NIEM Conformance

- **Conformance to NIEM is defined in terms of artifacts. The following artifacts are considered conformance targets to which sets of NIEM normative rules apply:**
  - **NIEM XML Schemas** - which conform to NIEM Naming and Design Rules (NDR). Note: XML schemas can contain NIEM elements and types and still not be conformant
  - **NIEM XML Instances** - which conform by validating to NIEM-conforming XML schemas, with additional conformance rules specified by the NIEM NDR
  - **NIEM IEPDs** - which conform to the requirements of the Model Package Description (MPD) Specification

4.4 Model Package Description Specification

- **The NIEM Model Package Description (MPD) Specification is a peer to the NDR and covers the guidelines for creating IEPDs**
- **The MPD:**
  - Defines terminology
  - Identifies required and optional artifacts and metadata in IEPDs
  - Specifies normative rules, schemas, and syntax
  - Provides non-normative guidance
  - Refers to other related NIEM specifications for more detail

4.4 IEPD Conformance

- **An IEPD conforms to NIEM under the following conditions:**
  - Each XML schema within the IEPD adheres to all rules in the NIEM NDR for the schema's conformance target class
  - Each sample XML instance validates to a NIEM-conformant schema, and adheres to all rules in the NIEM NDR for XML instances
  - The IEPD adheres to the NIEM MPD Specification (including required files, packaging, metadata, etc.)
  - The IEPD does not unnecessarily duplicate NIEM components; NIEM components are used directly or as a basis for derived components if the business semantics match
  - The IEPD preserves the semantic and structural consistency of the NIEM components it uses

4.4 NIEM Conformance is NOT

- **Systems, tools and databases do not and cannot conform to NIEM. Systems, tools and databases can be NIEM-aware or NIEM-supporting if they have capabilities defined specifically to:**
  - Develop or implement NIEM-conformant IEPDs
  - Create extensions for XML data components not defined in NIEM
  - Test or verify NIEM-conformance
  - Generate, send and receive, and/or process NIEM-conformant information exchanges
- **Conformance is not NIEM Compliance. Compliance implies an enforcement and certification process, which currently does not exist**

4 – IEPD Development and Implementation

4.5 Assemble and Document

4.5 Document-Based Artifacts

- **The following document-based artifacts are required to provide context and discoverability of the IEPD:**
  - Master Document
  - Catalog
  - Change Log

4.5 Master Document

- **The Master Document contains detailed business and technical information about an information exchange**
  - Used to provide an overview of an information exchange and explain the design decisions that were made during its development
  - Provides human-readable context for the exchange
  - Divided into sections for each of the different areas that describe an information exchange
  - Developed throughout the course of the IEPD Lifecycle

4.5 Catalog

- **An XML file that contains all the metadata that describes an IEPD to facilitate human understanding, tool support, and machine processing**
  - Unique identification
  - Basic descriptive characteristics
  - Directory structure and artifacts
  - Lineage and relationships to other IEPDs

4.5 Change Log

- **The Change Log records modifications made to an IEPD, the developer of those changes, the change date, and the versions number**
  - Required as part of the IEPD
  - Should include as much detail as possible about the changes

Change Log			
Version	Date	Description of Changes	Author
1.0	2/2/03	Original Version	OCIO
1.1	4/16/03	Added new elements to subset schema	Sarah D.
2.0	12/5/04	Updated requirements and constraint schema	Sarah D.

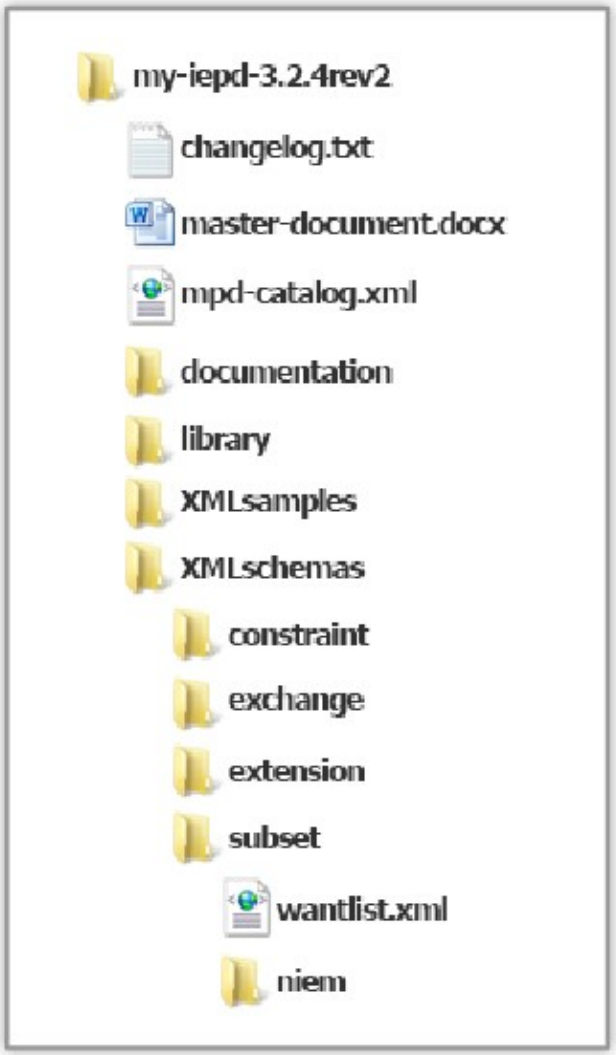
4.5 Additional IEPD Artifacts

- **Organizations and IEPD developers can choose to add additional artifacts to improve the quality of the IEPD**

Exchange Files	• WSDL Definitions • XML Instance Examples	• SOAP Message Files
Documentation	• Memorandums of Agreement • Methodology and Tools • Testing and Conformance	• Best Practices • Extension Information • Endorsement Letters • Implementation Methods

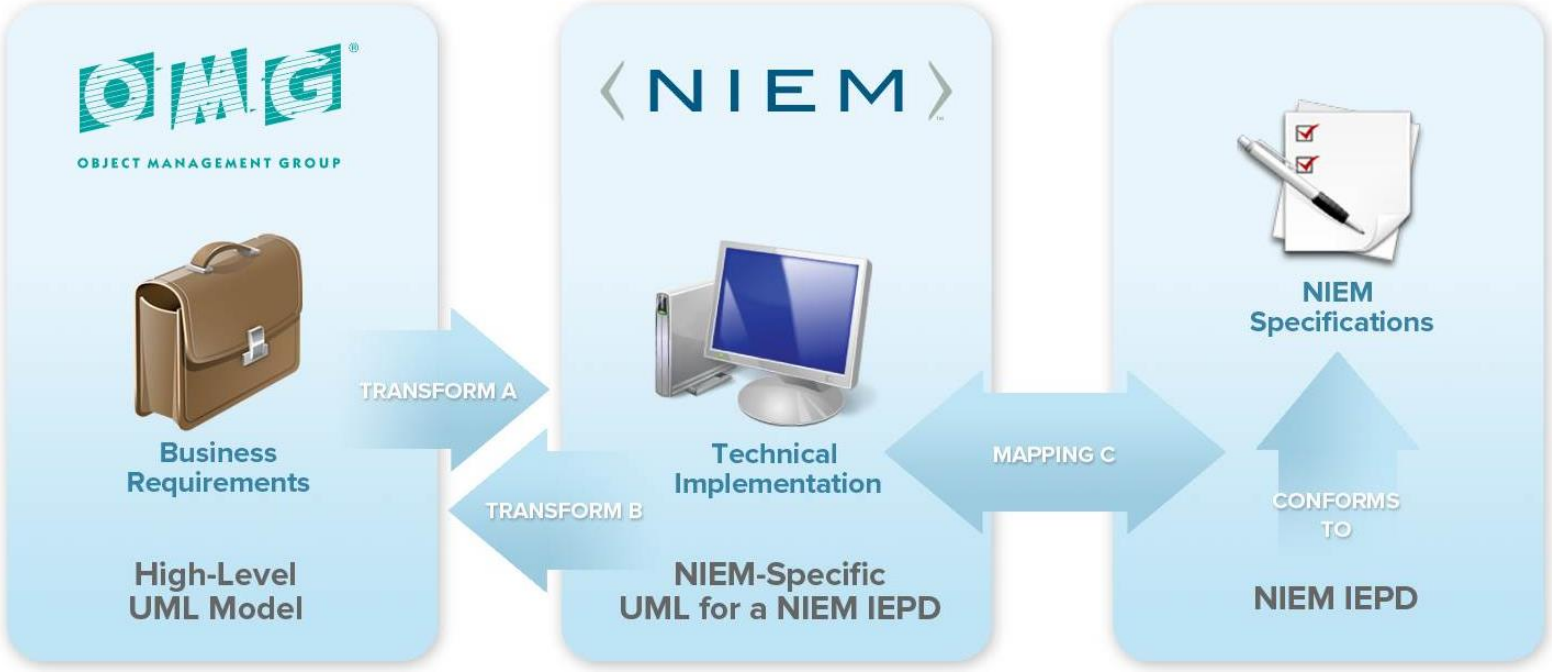
4.5 IEPD Package

- **The IEPD is a single, encapsulated archive of all the necessary artifacts that define an information exchange**
  - Different organizations may have different requirements for artifacts and structure
  - The standard used should include a consistent naming and folder structure, following the guidelines laid out in the MPD Specifications



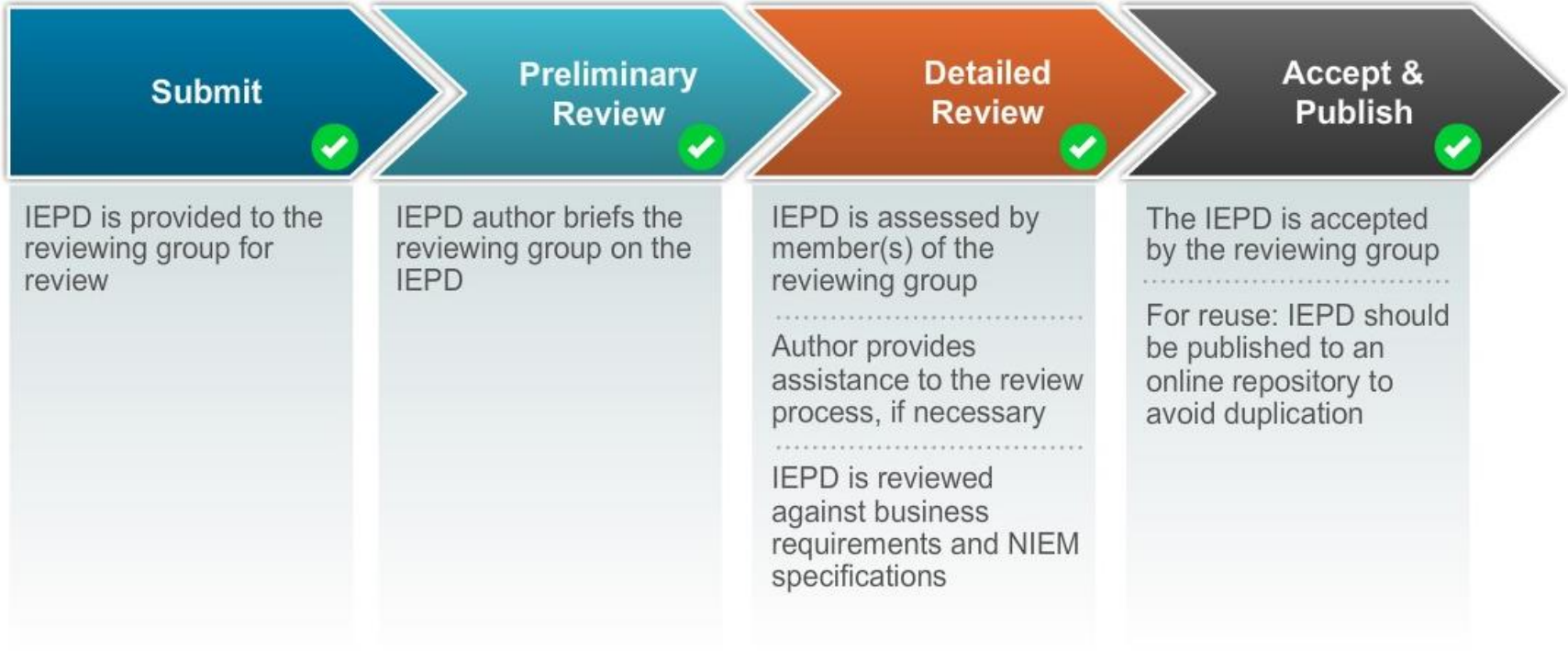
4.5 NIEM-UML Profile

- **The NIEM-UML Profile is an extension of a subset of Unified Modeling Language (UML) that is specific to NIEM.**
- **NIEM-UML allows modelers and developers to apply NIEM-UML with minimal effort to create new or change existing models to produce 100% NIEM conformant information exchanges.**



4.5 IEPD Review

- **An IEPD Review Process is necessary to maintain a consistent standard of quality in documents that are accepted for publication in support of organizational information sharing initiatives**



4 – IEPD Development and Implementation

4.6 Publish and Implement

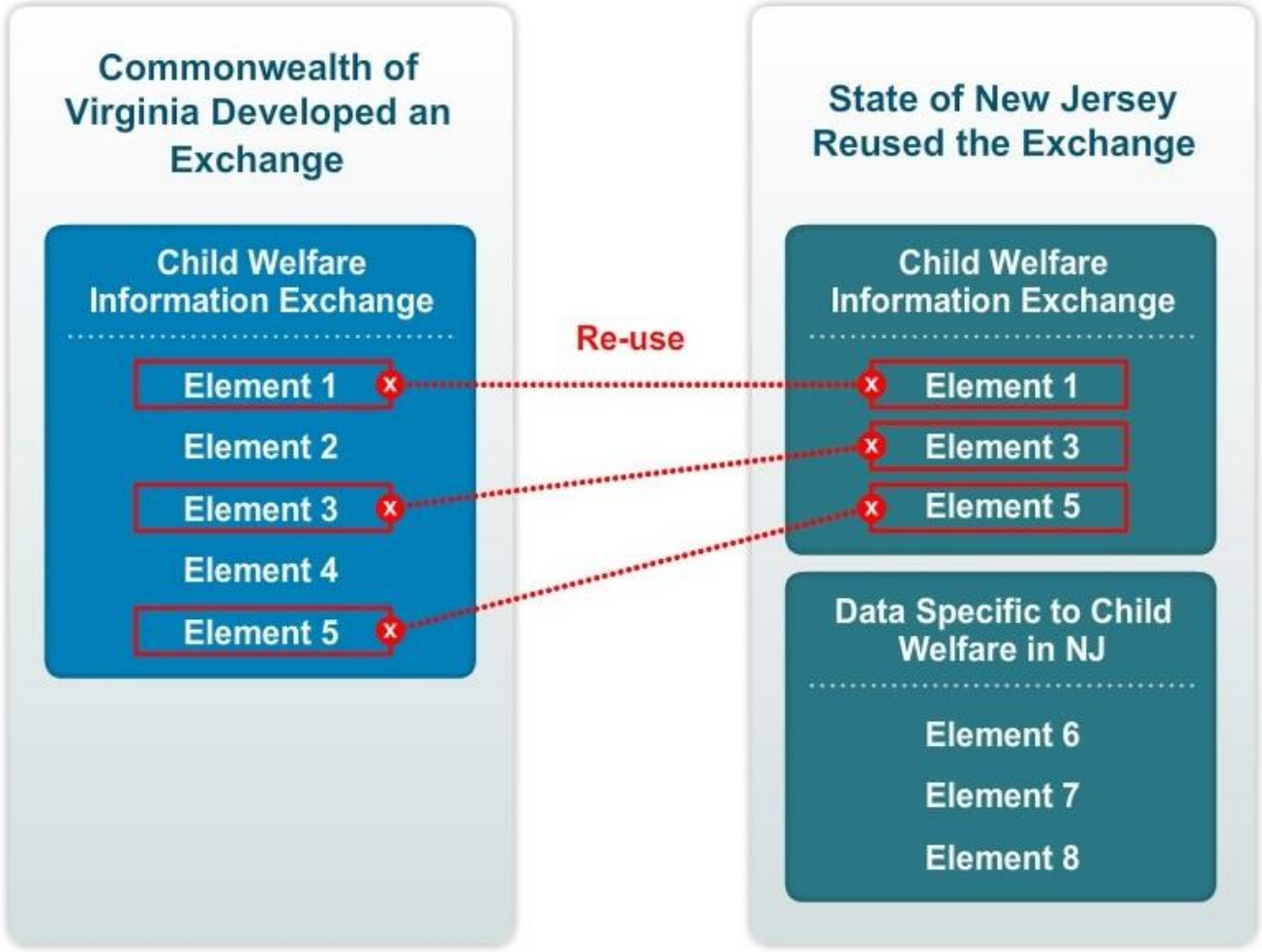
4.6 Online IEPD Repositories

- **Publishing IEPDs to an online repository enables their search, discovery, and reuse**
  - IEPD Clearinghouse at NIEM.gov/ojpiepdclearinghouse
    - Publically available
    - Registry; contains links to IEPDs, IEPDs are not stored
  - DHS Data Architecture Repository (DAR)
    - Restricted access
    - Contains DHS data assets, business processes, and services that are available to Information Sharing Environment (ISE) users
  - NIEM.gov Online Repository at tools.niem.gov/niemtools/iepdt/index.iepd
    - Publically available
    - Maintained by Georgia Tech Research Institute (GTRI), which provides technical support for NIEM

4.6 IEPD Reuse

- **After publication, existing IEPDs can be reused in the creation of new IEPDs, which can:**
  - Reduce development time
  - Increase consistency of data definitions
- **IEPDs can be reused at the following levels:**

4.6 Reuse Example

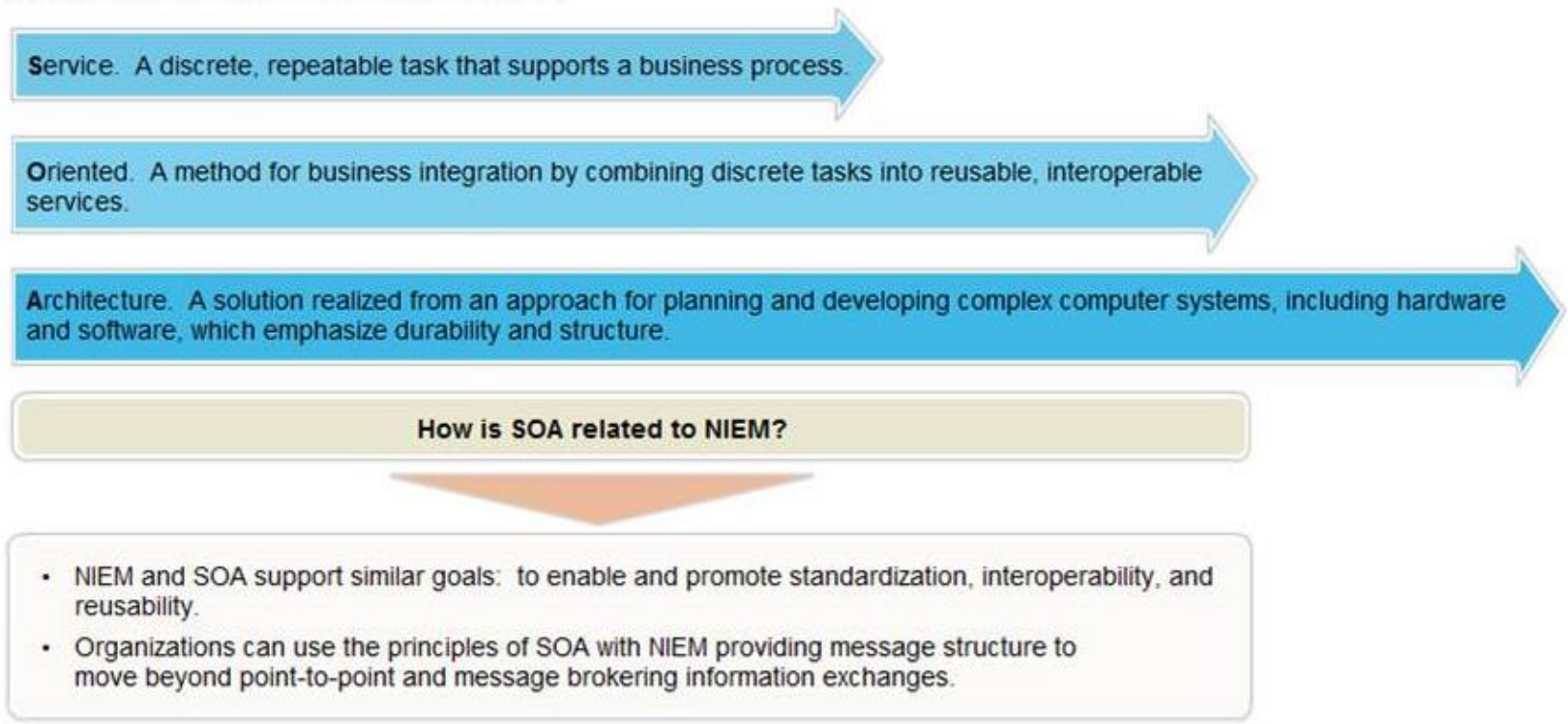


4.6 Information Exchange Implementation

- **In order to promote infrastructure flexibility, NIEM does not define implementation specifications. NIEM defines only the format and structure of the "payload" data within information exchanges**
- **Exchange partners decide how to store and process the NIEM-conformant data being exchanged**
- **The scale of the implementation can vary widely, from an enterprise-level SOA implementation to an exchange-specific implementation**
- **Security and privacy should be key considerations when implementing an exchange**

4.6 Service Oriented Architecture and NIEM

- **Service Oriented Architecture (SOA) provides packaged, reusable, and interoperable IT services that serve specific business goals and strategic objectives**



4.6 Web Services and NIEM

- **NIEM information exchanges are most commonly implemented as Web Services**

Services are local, repeatable IT tasks that support one or more business processes

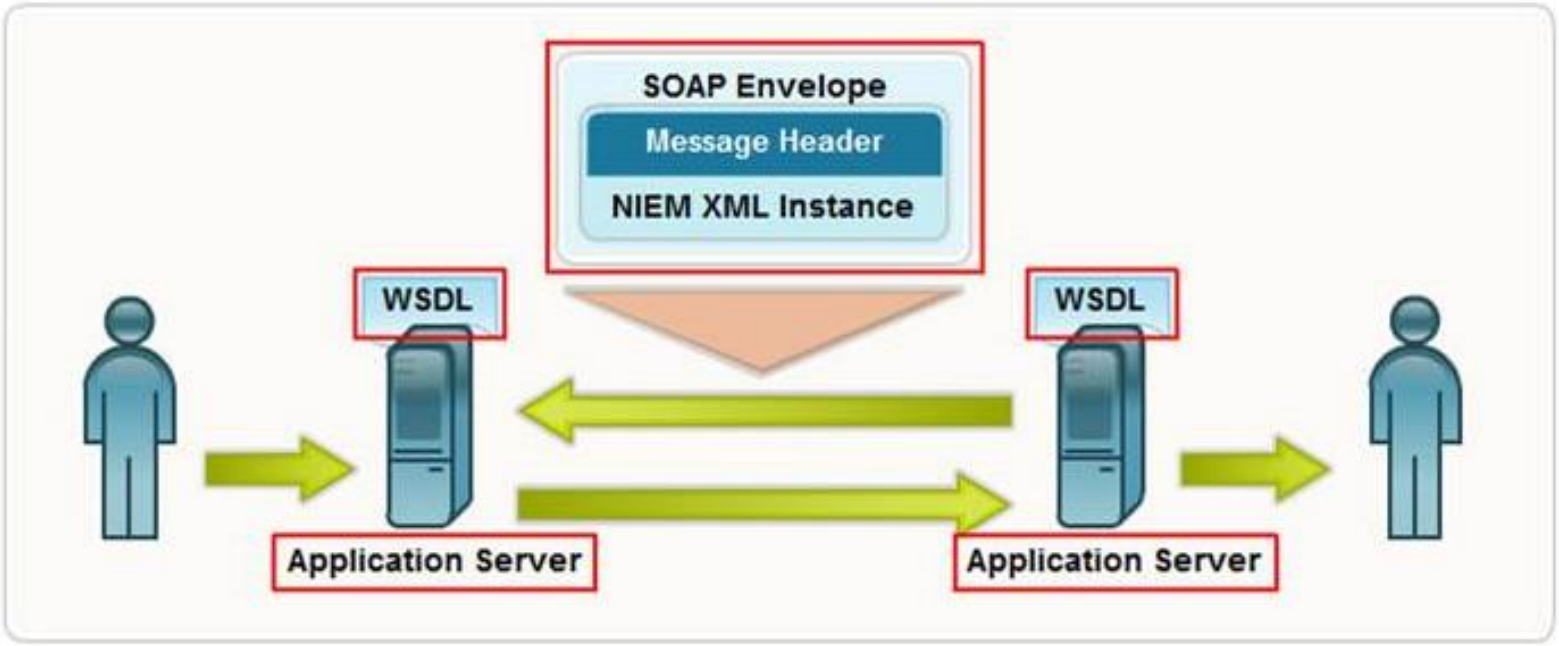
Web Services are services that provide integration capability and interoperability between disparate IT systems

- Vendor neutral and supported by common standards
- Allow client and server-side application development in any language or technology

In NIEM

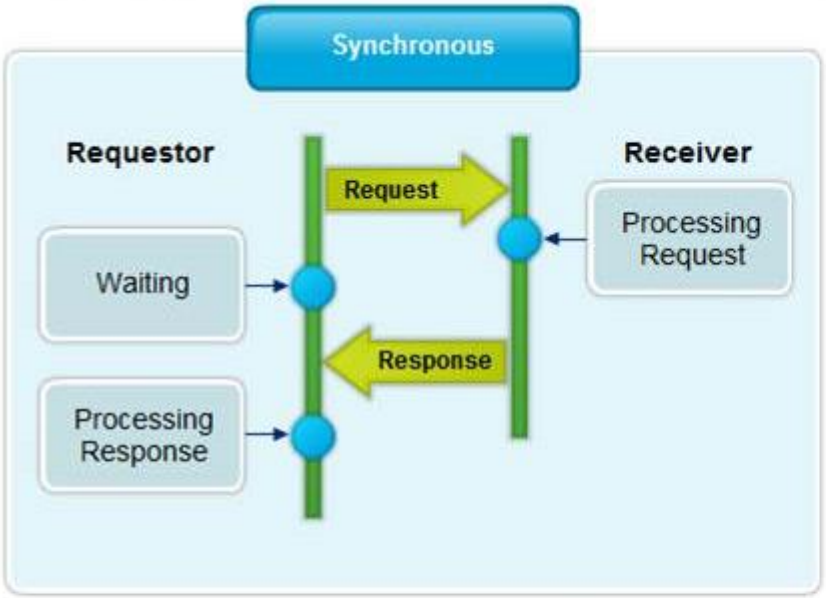
- IEPDs are primarily implemented in conjunction with web Services but are technology agnostic
- Web Services provide flexibility and also support key NIEM goals such as interoperability, open standards based design, and reusability

4.6 Web Services Implementation Example

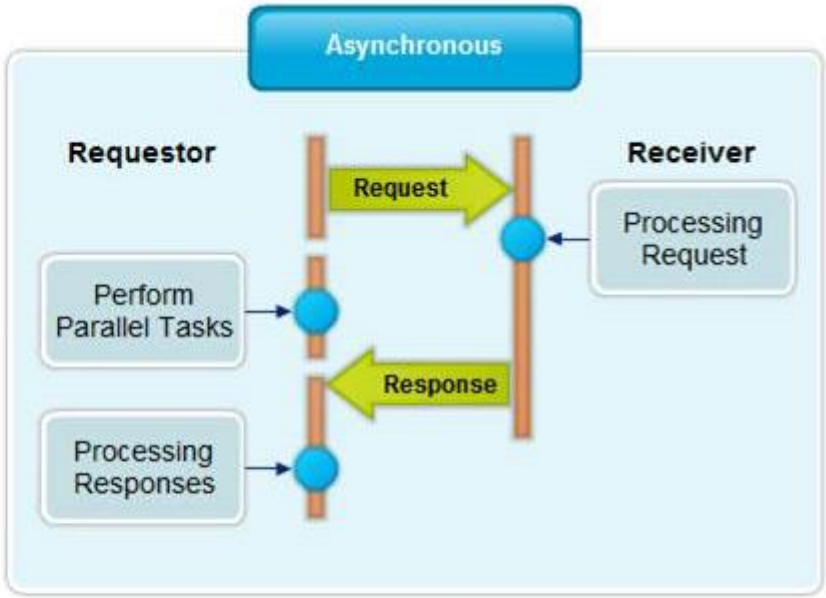


4.6 Communications Methods

- **Messaging systems primarily communicate using one of two methods, Synchronous or Asynchronous**



- Synchronous - A calling application transmits a message to a middleware application and waits for a response. The calling application waits until the response application processes and responds to the message, sending it back through the same channel.

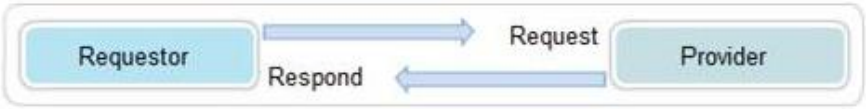


- Asynchronous - A calling application transmits a message to a middleware application and continues to work, checking for the response at a later time.

4.6 Message Exchange Patterns

- **Within both synchronous and asynchronous messaging, there are different messaging exchange patterns that can be used, ranging from the simple to the complex:**

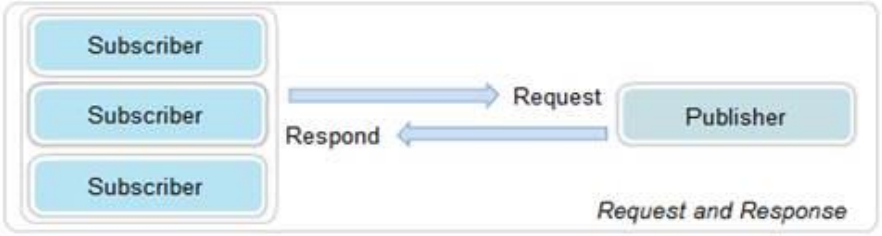
Request and Response: Single request and reply between two systems can be implemented synchronously or asynchronously.

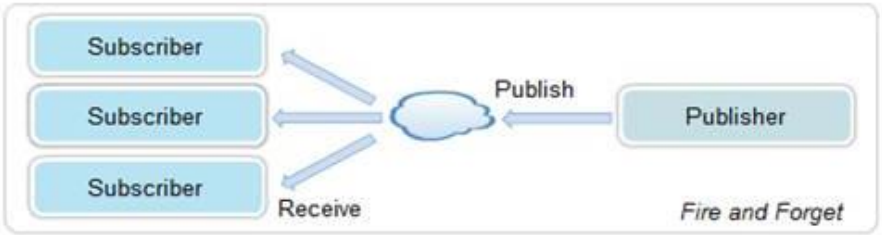


Fire and Forget: Simple "fire" of information between one sender and one or many receivers. Always asynchronous (forget).

"Conversational":
Two-way dialogue that has multiple requests/replies and an definite start and end.

Publish and Subscribe:
Information sent by one publisher and accepted by many subscribers. Separated into two messages; request/response and fire/forget.





4.6 Security and Privacy

- **NIEM conformant XML payloads can:**
  - Be encrypted during transmission and then decrypted by the consumer of the payload
  - Contain security and privacy metadata for the enforcement of rules governing the use, protection, dissemination, and access control for data being shared
- **NIEM 3.0 provides support for existing versions of Intelligence Community Metadata Standard for Information Security Marking (IC-ISM) attributes for security marking metadata and classified information**

4.6 Information Exchange Maintenance

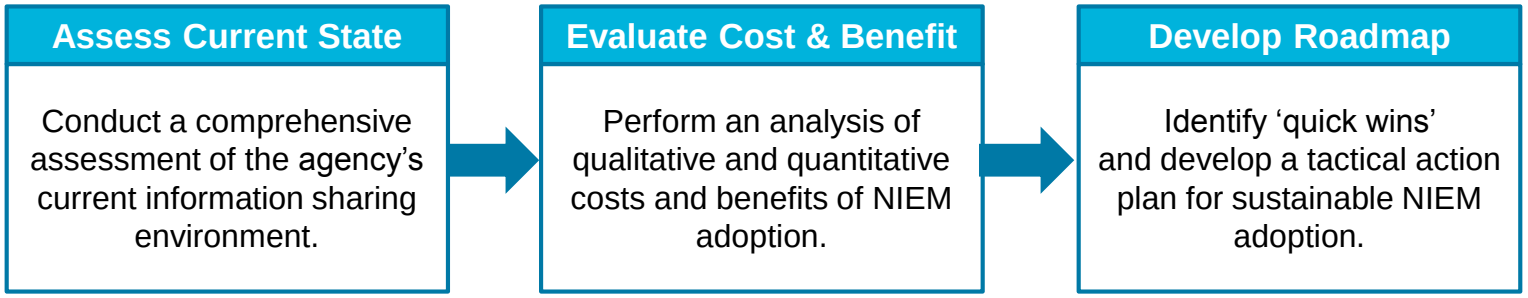
- **Information exchanges and IEPDs need to be maintained throughout their existence. The IEPD should be updated:**
  - For changes made in the information exchange and the new version published to the online repositories
  - With any changes in the technical infrastructure of the information exchange
- **A governance process should be established to actively manage changes made to the information exchange and IEPD**
- **Not maintaining an IEPD will result in poor documentation and limited reuse within and outside the organization**

5 – NIEM Adoption

5.1 NIEM Engagement Process

5.1 NIEM Engagement Process Overview

- **The engagement process is a self-service model that includes tools and methods for organizations to:**



- **NIEM Engagement Process (NEP) Results**
  - Identify information exchanges where NIEM can provide the most value to the agency
  - Develop a tailored action plan outlining how the agency can adopt and sustainably use NIEM for information sharing and exchange
- **NIEM Engagement Process at** www.niem.gov/aboutniem/roadmap/Pages/niem-engagement.aspx

5.1 NIEM Engagement Process Approach

- **The NIEM Engagement Process includes five key activities that take place over 10-12 weeks**

NIEM Engagement Process					
Step #	**1**	**2**	**3**	**4**	**5**
Step	Perform Research	Conduct Stakeholder Interviews	Complete NIEM Readiness Assessment	Quantify and Qualify the Value of NIEM	Adoption Plan
Duration	2 weeks	4 weeks	1 week	3 weeks	2 weeks
Key Activities	1) Conduct research regarding the program's mission priorities and current information sharing and exchange activities. 2) If appropriate, note any additional programs that could potentially benefit from NIEM.	1) Hold interviews with the program points of contact (POCs) identified by the sponsor. During the interview, draw upon initial research to discuss current and potential information exchange(s).	1) Compile the interview results and initial research to complete the NIEM Readiness Assessment.	1) Complete the Cost Model by inputting cost variables, values from the NIEM Readiness Assessment, and other data gathered through stakeholder interviews and research. 2) Define performance metrics for the exchange.	1) Summarize key findings. 2) Design a tactical implementation plan. 3) Validate the Adoption Plan with participants.
Tools and Templates	NIEM Interview Framework	NIEM Interview Framework	NIEM Readiness Assessment Tool	NIEM Cost Model	Road to NIEM Adoption
Expected Outcomes	Organizational research	Interview responses	Completed NIEM Readiness Assessment	Estimated costs Performance metrics	NIEM Adoption Plan

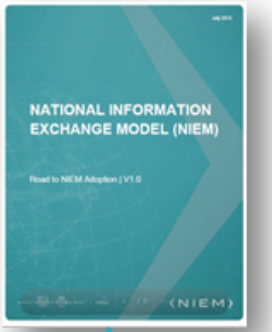
5.1 NIEM Engagement Tools

- **The NIEM Engagement Process provides the following support tools**

Readiness Assessment

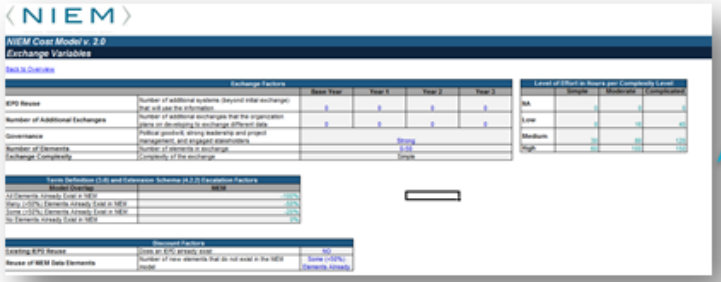
Evaluates the organization's readiness to adopt NIEM

Roadmap to NIEM Adoption



Supports organizations with preparing, adopting, and continuously engaging their community with NIEM and NIEM-related processes

Cost Model



Assists organizations with quantifying the general costs associated with NIEM implementation

5 – NIEM Adoption

5.2 NIEM Readiness Assessment

5.2 NIEM Readiness Assessment

- **The following NIEM Core Capabilities and Indicators of an organization**
  - Business Need
  - Stakeholder Community
  - Planning Process
  - Technical Capabilities

  are assessed to determine if the organization is:
  - NIEM Ready - Well-positioned to realize value of information sharing and exchange
  - NIEM Capable - Capable of realizing value, but improvements are needed to realize full potential

5 – NIEM Adoption

5.3 NIEM Exchange Assessment

5.3 NIEM Exchange Assessment Overview

- **Planned exchanges should also be assessed to determine which are good candidates for a NIEM implementation**
- **As the result of the NIEM exchange assessment, a NIEM Exchange will be:**
  - **Recommended for a NIEM implementation** - For interfaces where the assessing organization will be the authoritative source for the data and controls how the interface will be implemented.
  - **Recommended for a NIEM implementation by Exchange Partners** - For interfaces where the exchange partner will be the authoritative source for the data and controls how the interface will be implemented. The assessing organization can recommend a NIEM implementation but the decision is ultimately the Exchange Partner's to make. The Exchange Partner may make the decision to provide the data but not use NIEM, or not to provide the data at all.
  - **Not recommended for a NIEM implementation** - Regardless of which organization will be the authoritative source of the interface, there is a compelling reason why a NIEM implementation is not recommended.

5.3 NIEM Exchange Assessment Criteria

The following NIEM Assessment Criteria address the business, technical and program management considerations of each exchange:

- **Value:** The business value or mission impact of the information being shared. The degree to which the information exchange facilitates the achievement of mission objectives, and/or affects business outcomes in a substantive, positive manner.
- **Reuse:** The potential reuse of the information exchange. The degree to which the information exchange can be reused to share information with a) additional stakeholders beyond the original exchange partners, and b) over time.
- **Process Improvement:** The level of process improvement (e.g. automation of manual process or improved turnaround time) expected from the information exchange.
- **Opportunity:** Whether there is a source and/or target system modernization effort either planned or in progress.

5.3 NIEM Exchange Assessment Criteria

NIEM Assessment Criteria (continued):

- **Executive Support:** Whether there is strong executive support for information sharing and exchange using NIEM.
- **Level of Effort:** The level of effort required to develop the NIEM Information Exchange Package Documentation (IEPD). Should consider exchange model size, complexity, and affinity with the NIEM reference model.
- **Means:** Whether there are adequate budget and staff resources for IEPD and IEP development.
- **Technical Feasibility:** Whether the exchange needs to support sub-second response times or large number of requests per second.
- **Alternatives:** Whether there are other exchange standards (besides NIEM) in existence that are better suited to implement the information exchange.

5 – NIEM Adoption

Exercise #3 - Exchange Assessment

5 – NIEM Adoption

5.4 NIEM Cost Model

5.4 NIEM Cost Model

- **The NIEM Cost Model is used to estimate the cost of developing NIEM exchanges from the initial development of an Information Exchange Package Documentation (IEPD) to an actual implementation and execution of the exchange.**
- **The NIEM Cost Model contains the following variables for estimation:**
  - Exchange: Exchange Factors, Level-of-Effort, Term Definition and Extension Schema Escalation Factors, and Discount Factors.
  - Cost: Resource Category, Other Costs, Funding, Outreach Costs
  - Activities: Level-of-Effort and Discount Factors for each task in the IEPD development process
- **NIEM Cost Model at** www.niem.gov/aboutniem/roadmap/Pages/cost-model.aspx

5 – NIEM Adoption

5.5 NIEM Adoption Plan

5.5 Adoption Plan Phases

- **Prepare for NIEM**

Phase	Description
Develop Community of Interest	Identify information sharing and exchange activity stakeholders to develop and understanding of NIEM use and agree on exchange process enhancements.
NIEM Training and Tools	Participate in available training (e.g., web-based, classroom) that is role based for each attendee.
NIEM Requirements	Define requirements needed for developing a common exchange for all stakeholders involved in the exchange process.

- **Adopt NIEM**

Phase	Description
Communication of implementation strategy to relevant stakeholders	Communicate to stakeholders NIEM implementation strategy that includes design and execution of a common and reusable information exchange format.
Map and model information exchange	Identify elements required to develop information exchange package documentation. All elements will be mapped to specific data components for information exchange execution.
Publish information exchange package	Publish information exchange package in a NIEM repository (e.g., IEPD Clearinghouse) for other stakeholders to search and discover for reuse.

- **Engage and Stand-Up NIEM**

Phase	Description
Encourage NIEM reuse for stakeholder groups	Develop an understanding/agreement (e.g., Memorandum of Understanding) with current and/or potential exchange partners that define usage agreements, sharing agreements and or minimum security requirements to assist with attaining common exchange format reuse.
Continuous communication with NIEM community	Engage with NIEM community and continuously communicate NIEM process execution to leverage lessons learned and implementation best practices.

6 – NIEM Support Framework

6.1 Tools for Development and Discovery

6.1 NIEM Tools

- **NIEM Tools support the all phases of the IEPD Lifecycle**
- **Tool Links:**
  - NIEM Tool Catalog at www.niem.gov/tools-catalog/Pages/tools.aspx
    - Schema Subset Generation Tool (SSGT)
    - Visual NIEM
    - Work with IEPDS
    - Code List Generator
    - Migration Assistance
    - NIEM Modeling Tool
    - Conformance Testing Assistant (ConTesA)
    - MagicDraw Cameo NIEM Plug-in (NIEM-UML)
    - NIEM Wayfarer
    - Content Assembly Mechanism (CAM) Editor Toolkit
    - Crossflo CDX ExchangeBuilder
  - Schema Central at www.schemacentral.com
  - MITRE's Open II at openii.sourceforge.net
  - IEPD Factory at archsmart.net
  - Altova Mission Kit at www.altova.com/solutions/niem.html

6 – NIEM Support Framework

6.2 References

6.2 References

- **At** NIEM.gov/reference
- **Normative Specifications**
  - Naming and Design Rules (NDR)*
  - Model Package Description (MPD) Specification*
  - High-Level Version Architecture
  - High-Level Tool Architecture
  - NIEM Conformance#
  - Conformance Targets Attribute Specification (CTAS)#
  - Object Management Group (OMG) NIEM-UML Profile#
- **Non-Normative Specifications**
  - User Guide
  - Techniques for Building and Extending NIEM

*** Updated in NIEM 3.0**

 # New in NIEM 3.0

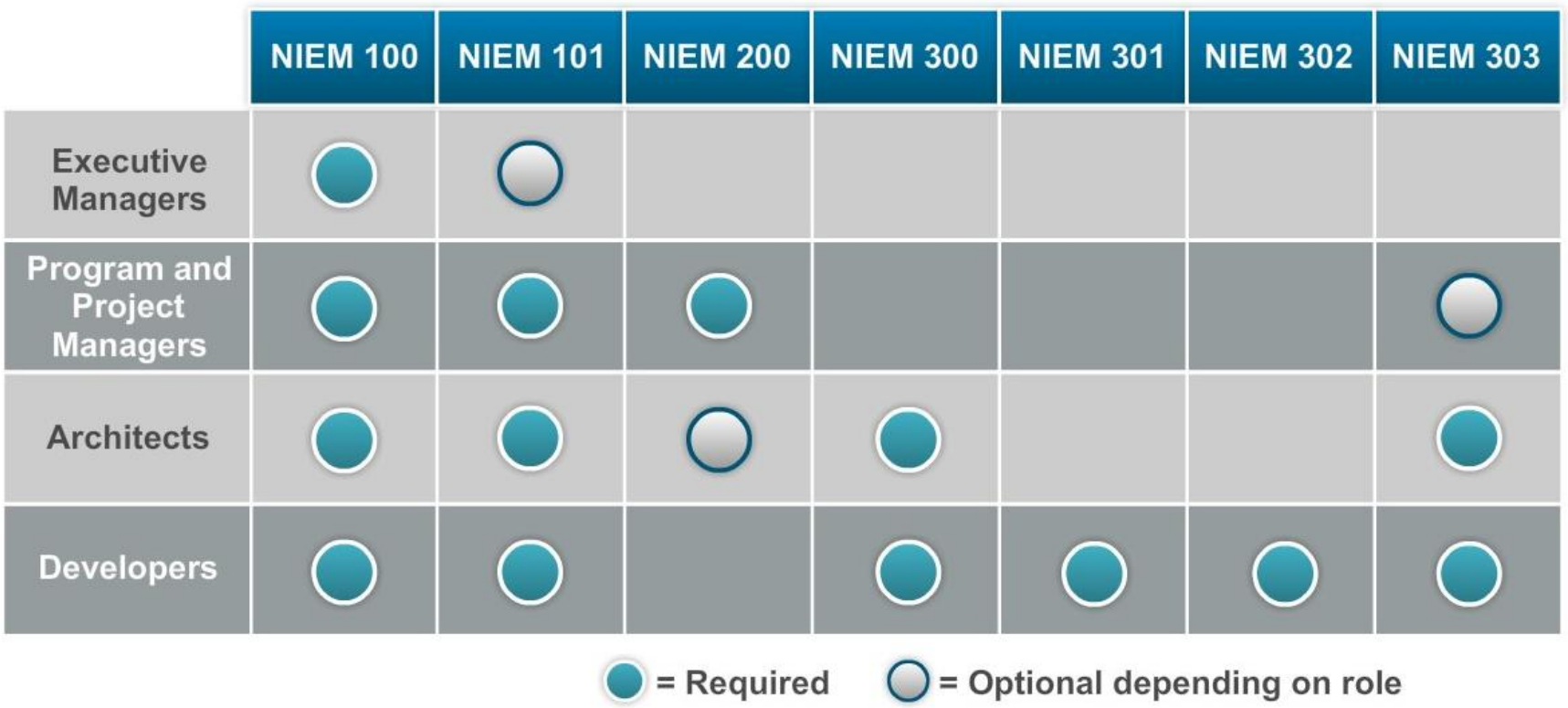
6 – NIEM Support Framework

6.3 Established Training Program

6.3 NIEM Training Curriculum

- **Comprehensive NIEM training is available:**
  - NIEM 100 – General Overview
  - NIEM 101 – Technical Introduction to NIEM
  - NIEM 200 – NIEM Project Management
  - NIEM 300 – IEPD Discovery and Development
  - NIEM 301 – Advanced NIEM Technical Concepts
  - NIEM 302 – Build and Validate an IEPD
  - NIEM 303 – Assemble, Publish and Implement an IEPD

6.3 NIEM Training Curriculum



6.3 NIEM Training Options

- **Classroom (hosted by the IJIS Institute) at** NIEM.gov/training
  - NIEM Technical Training (comprised of NIEM 101, NIEM 300, NIEM 301, NIEM 302, NIEM 303 modules)
- **Online (all modules) at** NIEM.gov/training
- **Webinars at** NIEM.gov/webinars
  - Overview of the Model Package Description (MPD) Specification
  - MPD Technical Overview
  - NIEM-UML
    - High-Level Introduction
    - NIEM-UML Specification Overview
    - Creating a NIEM IEPD with NIEM-UML
    - Modeling Properties and Associations in NIEM-UML
    - NIEM-UML Subsetting and Extension
- **Schema Subset Generation Tool (SSGT) Tutorial at** https://vimeo.com/109940669?goback=%2Egde_1903175_member_5932685270829801472

6 – NIEM Support Framework

6.4 Development Support

6.4 National Information Sharing Help Desk

- **Contact the National Information Sharing (NISS) help desk or access the NISS online knowledge base (available 24 hours a day, 7 days a week) at** http://it.ojp.gov/default.aspx?area=implementationAssistance&page=1117
- **Live technical support staff is available from 9:00 a.m.–8:00 p.m. (EST) Monday–Friday, excluding federal holidays, at 1-877-333-5111 or 1-703-726-1919**
- **Contact NISS by email at** nisshelp@ijis.org

6.4 NIEM Community

- **Fellow Practitioners – IEPD best practices and advice**
- **NIEM User Groups – IEPD discovery**
- **NIEM Blog - NIEM Tools, Training and IEPD development Tips and Tricks at** niem-tools.blogspot.com
- **MITRE NIEM Practitioner Community at** niem-practitioner-community-list@lists.mitre.org

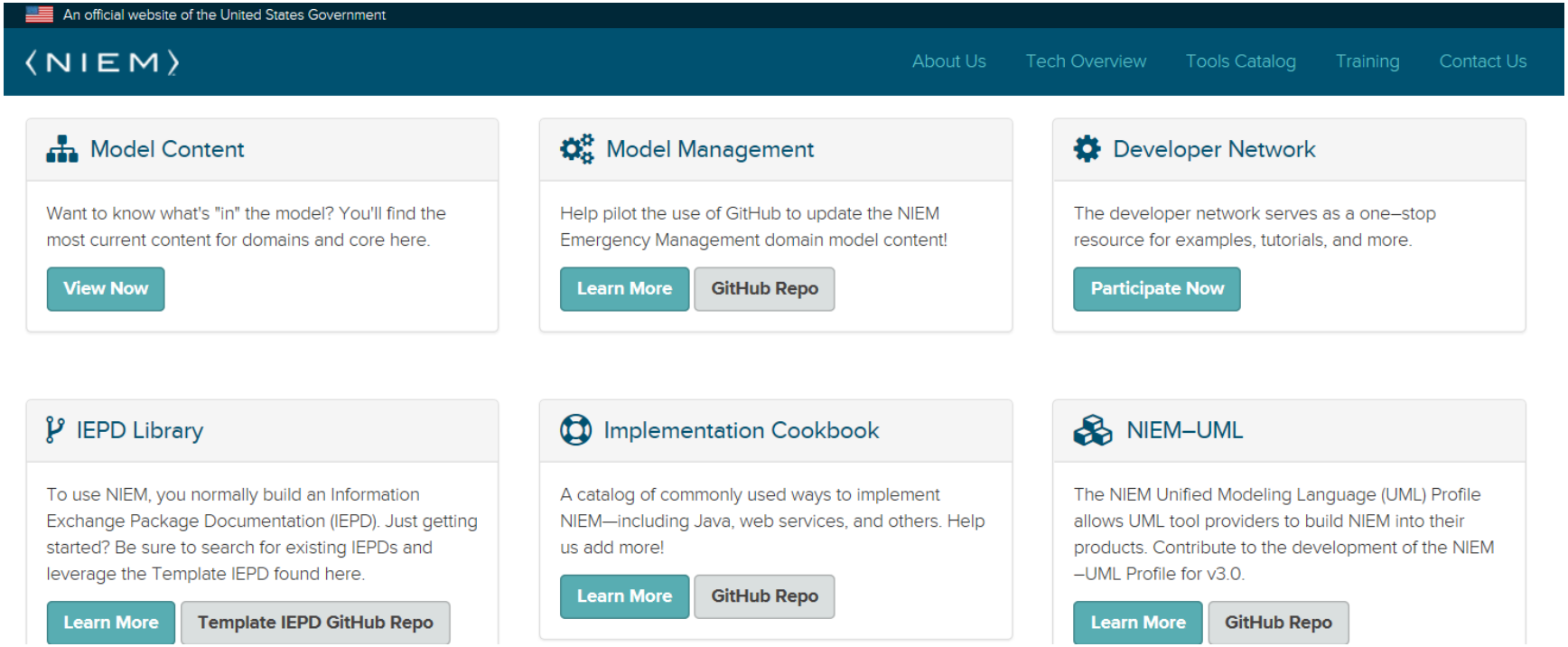
6 – NIEM Support Framework

6.4 NIEM.gov Website

NIEM.gov

MITRE

GitHub



Quick Reference

Links

Links

- **Amber Alert IEPD at** http://it.ojp.gov/default.aspx?area=implementationAssistance&page=1017&standard=456
- **IEPD Repositories**
  - IEPD Clearinghouse at NIEM.gov/ojpiepdclearinghouse
  - NIEM.gov Online Repository at tools.niem.gov/niemtools/iepdt/index.iepd
- **NIEM Communications**
  - Website at www.NIEM.gov
  - NIEM Social Media Outlets
    - LinkedIn at www.linkedin.com/groups?gid=1903175
    - Twitter at www.twitter.com/NIEMExecDir
    - YouTube at www.YouTube.com/NIEMConnects
  - NIEM Email - Sign up on www.NIEM.gov

Links

- **NIEM Adoption**
  - NIEM Engagement Process at www.niem.gov/aboutniem/roadmap/Pages/niem-engagement.aspx
  - NIEM Cost Model at www.niem.gov/aboutniem/roadmap/Pages/cost-model.aspx
- **NIEM Tools**
  - NIEM Tool Catalog at www.niem.gov/tools-catalog/Pages/tools.aspx
  - Schema Central at www.schemacentral.com
  - MITRE's Open II at openii.sourceforge.net
  - IEPD Factory at archsmart.net
  - Altova Mission Kit at www.altova.com/solutions/niem.html
- **NIEM References at** NIEM.gov/reference

Links

- **NIEM Training**
  - Classroom (hosted by the IJIS Institute) at NIEM.gov/training
  - Online (all modules) at NIEM.gov/training
  - Webinars at NIEM.gov/webinars
  - Schema Subset Generation Tool (SSGT) Tutorial at https://vimeo.com/109940669?goback=%2Egde_1903175_member_5932685270829801472
- **NIEM Help Desk**
  - National Information Sharing (NISS) help desk or NISS online knowledge base at http://it.ojp.gov/default.aspx?area=implementationAssistance&page=1117
  - Contact NISS by email at nisshelp@ijis.org
- **NIEM Community**
  - NIEM Blog - NIEM Tools, Training and IEPD development Tips and Tricks at niem-tools.blogspot.com
  - MITRE NIEM Practitioner Community at niem-practitioner-community-list@lists.mitre.org