AGENCY INFORMATION EXCHANGE FUNCTIONAL STANDARDS EVALUATION

Adoption and Use of the

NATIONAL INFORMATION EXCHANGE MODEL (NIEM)

FEDERAL CIO COUNCIL

Data submitted as of June 11, 2010

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EXECUTIVE SUMMARY

Data and information are one of this Nation's most valuable assets, yet the majority of it is locked away in disconnected systems across a multitude of data centers. Many years of decentralized IT oversight, redundant IT software development and hardware purchasing, a disjointed approach to infrastructure, and failed IT projects created an information technology patchwork that increases the cost of government and puts mission-critical systems at risk.

The Federal Government has seen little productivity improvements on the over $600 billion spend on information technology over the past decade.[1] Delivering services effectively and efficiently is expected from our public in this new society that demands immediate data delivery to our finger tips anyway and anywhere it's needed. The American public wants from its government the type of service delivery they get at home and on their smart device. They want the simplicity of searching with one word and finding what they need across the vast resources of the web. Simply, the federal government's approach to IT infrastructure is not sufficient to meet current public expectations.

Government Chief Information Officers (CIOs) have been trying to adopt best practices for years yet progress within Government is far behind that of its private sector counterparts. The challenge to improve the deployment of information technology is squarely on the table for these CIOs to solve. These CIOs are struggling with tight budgets and resource constraints in an ever-changing IT landscape.

As technology has become an increasingly important service delivery tool, Government IT organizations have seen their missions expanded beyond consolidating server rooms and optimizing back-end software. It is not enough to address building the right technology infrastructure or to address consolidating data centers or to leverage cloud computing capabilities. Today's challenge includes recognizing that data within an agency is more valuable than the hardware or software used to collect, store and manage it. Improving information technology includes deploying shared services to increase mission performance, optimize information sharing and exchange, and ensuring data security and protection when leveraging cloud computing services. Gains for addressing today's challenges within government information technology should be focused on organizing the vast data in its inventory.

Since its inception in 2005, the National Information Exchange Model (NIEM) has been focused on data: understanding it, ensuring it is discoverable and standardizing it as it moves in between the current siloed stores across the Government. NIEM is not a software program, a computer system or a data repository but rather presents an approach to driving standardized connections among and between governmental entities as well as with private sector and international partners which enable disparate systems to share, exchange, accept, and translate information. With the use of the NIEM framework comes greater agility and efficiency in satisfying business needs and implementing repeatable processes. The common data connections developed using NIEM result in reusable artifacts that reduce future development costs resulting in cost avoidance.

In Fiscal Year (FY) 2010, the Office of Management and Budget (OMB) provided guidance to all Federal Agencies to evaluate the adoption and use of NIEM as the basis for developing reference information exchanges to support specification and implementation of reusable cross-boundary services.

[1]Office of Management and Budget (OMB) 25 Point Implementation Plan to Reform Federal Information Technology Management, Dec 9, 2010

While the adoption and use of an information exchange framework such as the National Information Exchange Model (NIEM) will not solve all of the challenges facing our CIOs, this report shows that several federal agencies have proven the use of NIEM has a critical part in changing the dynamic. Using NIEM as part of a broader data strategy supporting Enterprise Architecture means that the organization has agreed to challenge the "Status Quo" and has started on a path for innovation, light technology and shared solutions as outlined in the Office of Management and Budget (OMB) 25 Point Implementation Plan to Reform Federal Information Technology Management. NIEM as a tool empowers agencies to create and maintain meaningful data connections across their stove-piped information technology systems as well as across their stakeholder base of other federal, state, local, tribal, territorial, and international partners.

Contained within this document is a matrix illustrating planned or potential cross-domain opportunities for connecting data through standardized information exchange throughout the federal, state and local government and private sector. This report compiles information gathered from the agency response submissions and discussions. Deploying more effective information technology is about seizing these opportunities and breaking down the stovepipe systems. It's about eliminating inter-agency mistrust by improving transparency, data quality, and accountability through establishing authoritative sources for information.

To date, 22 federal agencies and 4 Lines of Business have been able to identify business driven cross-domain information exchange opportunities. Upon review of agency submissions, challenges exist in four key areas:

- *Establishing centralized governance*. A few agencies have an existing information exchange model with varying levels of governance in practice today. However, some agencies lack coordination amongst the various components that make up the enterprise which results in semantic overlap and lack of common standards.

- *Developing and implementing information exchange guidelines*. Although agencies have a defined Systems Development Life Cycle (SDLC), only some have a defined information exchange development process or 'go-to' standard for exchange development.

- *Creating collaborative sharing agreements*. Agencies do not always have the right points of contact within external agencies – which can hinder interagency collaboration. In addition, agencies do not have a complete understanding of what an external agency has available to share to enable improved decision making and mission performance.

- *Developing enterprise data management maturity*. Data management and information exchanges are essential to effectively exchange information across agencies. Sound data management practices provide the architectural foundation for the information that is to be exchanged by making the underlying data visible, accessible, understandable and trusted.

From the 26 submissions received, two agencies are currently implementing NIEM on an enterprise level. Overall, twelve agencies or Lines of Business have committed to use NIEM and eight are pursuing further evaluation. Of the six that have noted that they do not use NIEM, several opportunities exist for future use of NIEM. These numbers highlight the imperative need for consistent policies, processes, and governance capabilities as well as common definitions of data and information. As evident in the agency responses, there are varying levels of maturity across the federal government regarding information sharing and exchange. While some have robust capabilities, process, and policies in place others have room to improve. For example, one best practice at the Department of Homeland Security requires the use of NIEM as part of the Enterprise Systems Development Life Cycle (SDLC) as well as the Service Oriented Architecture Technical Framework.

Other agencies are beginning to include the use of NIEM in their IT strategic plans, Request for Proposals (RFPs) to vendors, and grant language to state and locals. The Department of Justice working through the Bureau of Justice Assistance as well as the Department of Homeland Security has grant language for state, local, and tribal partners to ensure adoption at all levels of the mission. Language includes but is not limited to "…*requires all grantees to use the latest NIEM specifications and guidelines regarding the use of Extensible Markup Language (XML) for all grant awards. Further information about the required use of NIEM specifications and guidelines is available at http://www.niem.gov.*"

In summary, this report highlights an unprecedented opportunity for substantial gains in increasing standardized connections and shared services for cross-boundary information exchange. It challenges the status quo of silos and presents a path forward to a strategy for significant gains. The analysis of these results, the maturity and capability of the agencies to deliver, and the potential indications of high reuse should be strategic drivers for the growth of the NIEM program, as it rises to meet these challenges and take advantage of these new opportunities.

The target audience of this report includes but is not limited to federal agency leadership, such as chief information officers, chief enterprise architects, and chief data architects; as well state, local, tribal and international partners, and federal and state legislative bodies.

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I. BACKGROUND

Today's environment demands faster, higher quality, lower cost mission enablement. In order to accommodate this, agencies must recognize the critical role that data plays in an agency's Enterprise Architecture. Increasing standardization for shared services provides a unique opportunity allowing an agency to drive strategic value through architecture.

In recognizing the benefits of information exchange as an enabler, the Office of Management and Budget (OMB) required agencies to evaluate the adoption and use of the National Information Exchange Model (NIEM) as the basis for developing reusable cross-boundary information exchanges.

A. INFORMATION EXCHANGE AS AN ENABLER

Within an agency, standardizing information exchange as information moves between systems provides the ability to make the enterprise work with the network of systems all around it. Federal agencies are able to compartmentalize systems and wrap them with a set of standardized exchanges that allow stakeholders to take information out, and put information in. These standardized exchanges constitute a platform that allows the push of information, with an appropriate policy framework and security model in place, so that integrated service delivery can be achieved at the edge.

Effective information exchange can enable agencies to:

- Breakdown stovepipe information systems for enhanced visibility and understanding, enabling agencies to connect the dots in their mission-centric areas;
- Increase engagement with organizations at the federal, state, local, and tribal levels including the private sector as well as international partners;
- Eliminate interagency mistrust by improved transparency, data quality, and accountability through establishing authoritative sources for information;
- Adopt consistent policies, processes, and governance capabilities;
- Increase use of description and definition of data and information for increased data protection and security; and
- Realize cost avoidance through the use of repeatable processes and reusable artifacts.

The goal of standardizing cross-boundary information exchange is to promote and enhance agency capabilities for the development of shared services and increasing the sharing of information. Standardizing information exchange includes the business processes, policies, procedures, architecture, and governance that support effective decision-making and mission-focused actions by providing timely, accurate, and relevant information to the appropriate individuals across all levels of government.

Current cross-boundary challenges need to be addressed head-on as we live in a shared mission age. Challenges and opportunities facing government chief information officers are too large for any one unit, organization, sector or nation to take on alone. Yet these challenges point to the reality that collaboration across the boundaries of units, organizations, and sectors is difficult.

Rather than seeking nationwide integration of all local, state, tribal, and federal information systems, the focus should be on the development of shared services using cross-boundary information exchange potential across multiple levels of government, allowing organizations and agencies to move information quickly and effectively without rebuilding systems.

Many government organizations have defined a need to implement an integrated framework for cross-boundary information exchange. Interagency programs and offices such as the Program Manager for the Information Sharing Environment (PM-ISE), Office of Management and Budget (OMB) Office of E-Government and Information Technology, and the Department of Health and Human Services (HHS) Office of National Coordinator (ONC) for Health Information Technology have all presented the need for a standard process to define cross-boundary information exchanges. Repeatedly, the NIEM[2] program has been identified by these initiatives as the target framework to successfully enable cross-boundary information exchange.

Previous successes have demonstrated the power of cross-boundary information exchange within the justice and law enforcement communities using NIEM. In 2007, state, local, federal officials and private sector partners came together to explore how to apply a common semantic lexicon and lessons learned to standardize suspicious activity reporting across the nation. The Information Sharing Environment Suspicious Activity Report (ISE-SAR) Functional Standard Development Team defined the elements that became the SAR Information Exchange Package Documentation (IEPD)[3]. The ISE-SAR IEPD defined the terms that would comprise a Suspicious Activity Report anywhere a SAR is used or generated by participating partners at the federal, state, local, and private levels.

NIEM served as the mechanism in providing element reuse and extension, where necessary, to achieve mission-specific cross-boundary information exchange. Beyond providing element reuse, NIEM also provided a framework for discovery and agreement of key policies and business processes across agencies and departments. The NIEM process facilitated a dialogue with privacy and civil liberties advocates-moving the debate from general discussions about the dangers of collecting SAR data to identifying specific data elements that should be afforded certain privacy protections. Reuse has been achieved, beyond what was initially envisioned, through implementation of the ISE-SAR IEPD in Canada as well as Sweden to improve information sharing and exchange within their public safety operations.

The value of NIEM is not found only in the law enforcement and homeland security Communities of Interest (COI)[4]. There is broad applicability when it comes to cross-boundary information sharing and exchange. A recent example includes the use of NIEM in the creation of schemas to support the data collection required for the American Recovery and Reinvestment Act (ARRA) of 2009. The Recipient Report Submission IEPD supported the reporting requirement from recipients[5] of federal funds to the

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[2]More information on the National Information Exchange Model may be found here: http://www.niem.gov

[3]More information on Information Exchange Package Documentation (IEPDs) may be found here: http://www.niem.gov/whatIsAnIepd.php

[4]Communities of Interest are collaborative groups of user who require a shared vocabulary to exchange information to in pursuit of common goals, interests, and business objectives.

[5]The Recovery Act defines "recipient" as any entity that receives Recovery Act funds directly from the Federal Government (including Recovery Act funds received through grant, loan, or contract) other than an individual and includes a State that receives Recovery Act funds. Prime recipients are required to provide data on each sub-award that it has provided as either sub-contracts or sub-financial assistance (sub-grants, sub-loans).

FederalReporting.gov portal. This portal works with the Recovery.gov website to provide a comprehensive solution for ARRA recipient reporting and data transparency.

However, without a clear definition of a common exchange process or a predefined structure for reporting the data, the Recovery Accountability and Transparency Board (RATB) would be faced with significant challenges in efficiently identifying fraud, waste, abuse and mismanagement of recovery resources. The Recipient Report Submission IEPD enables common reporting – both from a process and data perspective – based on requirements established in Section 1512 of the Recovery Act. This initiative crossed numerous boundaries enabling the federal government to establish a standardized exchange for the submission of recipient reports from each state and from all participating prime and sub recipients.

The creation of cross-boundary information exchanges allow agencies to quickly enable information sharing and exchange, at a higher quality through use of an established process and model, and at a lower cost through the reuse capabilities supported by a common model. Integrated into the NIEM framework are ready-to-use methodologies, tools, training, data models and an active practitioner community.

Participation has afforded the opportunity for organizations, at all levels of government, to identify, integrate, use and share best practices in creating high value information exchanges while realizing the value of a tactical approach to information sharing. This approach has consequently led to the maturation of the NIEM framework and processes as additional agencies become strategic partners in NIEM.

B. OFFICE OF MANAGEMENT AND BUDGET GUIDANCE ASSESSMENT

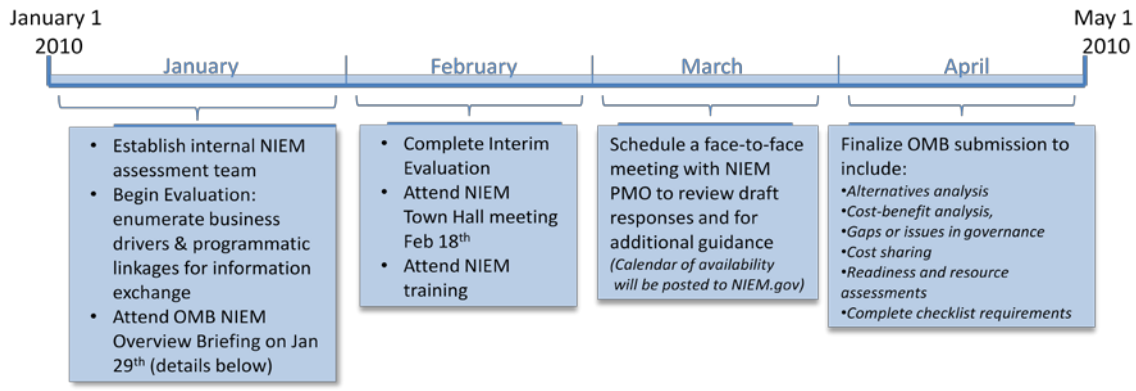
> *Per OMB guidance, by 5/1/2010, all agencies shall evaluate the adoption and use of the National Information Exchange Model as the basis for developing reference information exchange package descriptions to support specification and implementation of reusable cross-boundary information exchanges. A cross-boundary information exchange is one that crosses a bureau or agency boundary, including information sharing with international, State, local, tribal, industry, or non-governmental organization partners.*

The OMB reached out to the NIEM Program Management Office (PMO) to provide guidance and the necessary tools to help agencies meet the required guidance. The NIEM PMO assisted in the creation of the guidance template document and provided outreach activities to agencies requiring additional clarification or education of NIEM. The NIEM PMO provided the requisite knowledge of the NIEM framework on behalf of OMB including face-to-face meetings with 13 agencies. Additionally, the NIEM PMO scheduled out-of-cycle NIEM technical training opportunities to meet agency demand for increased education. In addition, the NIEM PMO, in coordination with the Department of Homeland Security's (DHS) Enterprise Data Management Office, sponsored an "Enterprise Data Management and NIEM: Positive Impacts on Information Sharing and Exchange" roundtable for Federal Chief Enterprise Architects and Data Architects. The session focused on the following themes:

- Enterprise Data Management and NIEM: How do they relate, and why should you care;
- NIEM as a Tool: How it can help from a business and technical perspective; and
- Enterprise Data Management: Existing Best Practices.

The round-table brought together 22 attendees from 16 Federal agencies and led to increased interest in future collaboration and sharing of best practices in enterprise data management and information sharing and exchange.

The timeline established for the OMB guidance process was implemented as follows:



January 2010

- OMB NIEM Overview Briefing
    - OMB briefed agencies on the Agency Information Sharing Functional Standards Evaluation
    - NIEM PMO provided NIEM 100 Overview brief to agencies
    - 68 total attendees from over 20 Federal Agencies
- Draft Information Sharing Functional Specification Guidance and Templates Version 0.1 is developed and published

February 2010

- Agencies begin evaluation
- Agencies requested to comment on version 0.1 of the guidance and templates
- Agencies invited to attend NIEM Town Hall Meeting
    - Over 100 total attendees from federal, state, local, and private sector (17 from Federal Agencies working evaluations)
- Agencies invited to attend NIEM Training (Cancelled due to snow)
- Agencies submit comments on version 0.1 of the guidance and templates

March 2010

- Final Agency Information Sharing Functional Specification Guidance and Templates Version 0.2 is developed and published
- Agencies schedule face-to-face meetings with NIEM PMO
- Agencies invited to attend NIEM Training
    - 1st Training Session: 15 total attendees from 8 Federal Agencies
    - 2nd Training Session: 18 total attendees from 11 Federal Agencies

April 2010

- Agencies schedule face-to-face meetings with NIEM PMO
- Agencies finalize OMB FY11 NIEM Assessment responses, which includes:

- Executive Summary
- Business Scenario
- Exchange Specifications
- Agency Information Exchange Capabilities
- Alternatives Analysis
- NIEM Readiness

May 1, 2010

- Agencies deliver OMB FY11 NIEM Assessment response to OMB

June 2010

- Agencies invited to attend NIEM Training
  - 7 total attendees from 3 Federal Agencies
- Agencies continue to schedule face-to-face meetings with NIEM PMO for guidance, next steps, training, and points of contact at other agencies

C. OVERALL RESPONSE SUMMARY

To date 22 agencies and 4 Lines of Business (LoBs) have submitted their evaluation. Currently two agencies, the Department of Homeland Security (DHS) and the Department of Justice (DOJ), are implementing NIEM on an enterprise level. Overall, twelve agencies have committed to use NIEM, while seven agencies and one LoB are pursuing further evaluation. These numbers highlight an opportunity for consistent policies, processes, and governance capabilities as well as common definitions of data and information for over half of the major federal agencies. As most of the entities completing the evaluation are federal agencies and state and local information sharing stakeholders; this assessment eludes to a significant opportunity to increase not only cross-boundary information exchange, but to significantly impact agency centric cross-jurisdictional information exchange at the same time.

INITIAL RESPONSE	NUMBER
Committed to Using NIEM	12
Further Evaluation Required	8
Will Not Use NIEM	6

Table 1: Summary of Responses

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II. PRESENT ENVIRONMENT

There are varying levels of maturity across the federal government regarding information sharing and exchange. While some have robust capabilities, process, and policies in place others have room to improve.

Upon review of agency submissions, challenges exist in four key areas:

- *Establishing centralized governance.* A few agencies have an existing information exchange model with varying levels of governance in practice today. However, some agencies lack coordination amongst the various components that make up the enterprise which results in semantic overlap and lack of common standards.

- *Developing and implementing information sharing and exchange guidelines.* Although agencies have a defined Systems Development Life Cycle (SDLC), only some have a defined information exchange development process or 'go-to' standard for exchange development.

- *Creating collaborative sharing agreements.* Agencies do not always have the right points of contact within external agencies – which can hinder interagency collaboration. In addition, agencies do not have a complete understanding of what information and services an external agency has available to share to enable improved decision making and mission performance.

- *Developing enterprise data management maturity.* Data management and information exchanges are essential to effectively sharing information with the Enterprise. Sound data management practices provide the architectural foundation for the information that is to be exchanged by making the underlying data visible, accessible, understandable and trusted.

From the 26 submissions received, two agencies are currently implementing NIEM on an enterprise level. Overall, twelve agencies or Lines of Business have committed to use NIEM and eight are pursuing further evaluation. Of the six that have noted that they do not use NIEM, several opportunities exist for future use of NIEM. These numbers highlight the imperative need for consistent policies, processes, and governance capabilities as well as common definitions of data and information. As evident in the agency responses, there are varying levels of maturity across the federal government regarding information sharing and exchange. While some have robust capabilities, process, and policies in place others have room to improve. For example, one best practice at the Department of Homeland Security requires the use of NIEM as part of the Enterprise Systems Development Life Cycle (SDLC) as well as the Service Oriented Architecture Technical Framework.

A. OFFICE OF MANAGEMENT AND BUDGET (OMB) GUIDANCE ASSESSMENT RESULTS

Table 2 – Agency Stop Light Chart shows the overall status of the use of NIEM identified in the individual agency or LoB responses. Each agency that responded, using the template provided by the Office of Management and Budget (OMB), has a detailed summary in Appendix E of this document.

Agency	Use of NIEM
Department of Agriculture	Committed to Use
Department of Defense	Further Evaluation Required
Department of Education	Will Not 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	Further Evaluation Required
Department of the Interior	Committed to Use
Department of the Treasury	Committed to Use
Department of Transportation	Committed to Use
Department of Veterans Affairs	Further Evaluation Required
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	Will Not Use
National Science Foundation	Committed to Use
Nuclear Regulatory Commission	Will Not Use
Office of the Director of National Intelligence	Further Evaluation Required
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	Will Not Use
Human Resources Line of Business	Will Not Use

Committed to Use - ■ Further Evaluation Required - ■ Will Not Use - ■

Table 2: Agency Stop Light Chart

SUMMARIES OF THE AGENCIES COMMITTED TO USE NIEM

Department of Agriculture (USDA) has committed to using NIEM. Currently, USDA has initiated a project called the Acreage Crop Reporting Streamlining Initiative (ACRSI). The cross domain information exchange allows for consistent reporting of common commodity data for use by the Risk Management Agency (RMA), Farm Services Agency (FSA), Natural Resources Conservation Service (NRCS), National Agriculture Statistics Service (NASS) and other USDA agencies. This cross domain exchange has significant potential for reuse across many federal agencies and private sector agriculture service providers.

Department of Energy (DOE) evaluated the use of NIEM to exchange information with the Department of the Army (Army) as part of the security clearance process. Security clearance determinations granting access to classified information and facilities considers factors that may make the person a risk to national security and is handled in the adjudication phase by the Army. Today's process consists of passing a .zip file from DOE to Army. The evaluation envisions converting the zip file exchange to be replaced by NIEM-conforming eXtensible Markup Language (XML). Additionally, the DOE, as part of the DOE Identity, Credential, and Access Management (ICAM) program, will adopt

NIEM into an interface with GSA to establish a central repository of the DOE Homeland Security Presidential Directive 12 (HSPD 12) credentialing data. This cross domain exchange has a high potential for reuse across all federal agencies.

Department of Health and Human Services (HHS) is committed to the use of NIEM for two high priority exchanges: Patient Health Summary and IT Investment Reporting. The Summary Care Record (also known as a Patient Health Summary) is defined as a concise, standardized clinical record that makes a patient health data set (including but not limited to medications, allergies, medical problems, test results, and medical procedures performed) available for consultations with specialists and/or for emergency medical treatment. In addition to using NIEM for health information exchanges, HHS is a pioneer in providing a foundation for establishing a common vocabulary and data structure that will help promote seamless exchange of information related to government-wide financial management, planning, and accountability program areas in a new domain within NIEM. This effort was started to provide standardized information exchange packages for monthly and annual agency submissions of investment data to the Federal IT Dashboard.[6] The cross domain exchange for financial management, planning and accountability has a high potential for reuse across all federal agencies.

Department of Homeland Security (DHS) is one of the co-founders of NIEM, and as such plans to continue supporting NIEM and the development of information exchange standards. DHS has made NIEM mandatory through its Enterprise Architecture, System Engineering Life Cycle, and Service Oriented Architecture governance activities. Over 60% of DHS' major IT programs are using NIEM for the development of information exchange in all new projects. As the current steward for the NIEM Program Management Office, DHS is deeply committed to the institutionalization of NIEM across the department and with its international, state, local, tribal and private sector partners. As an organization, DHS has far reach with cross-boundary exchanges of information with most, if not all, of the large federal agencies, over 100 countries, and with its state, local, tribal and private sector partners.

Department of Housing and Urban Development (HUD) evaluated the use of NIEM to exchange information for the Credit Alert Interactive Voice Response System (CAIVRS), which contains data exchanges with many agencies, and is used by HUD-approved lenders, several participating federal lending agencies, and lenders acting on the Government's behalf to prescreen applicants for federally guaranteed loans against a shared inter-agency database of delinquent federal borrowers. CAIVRS contains many data exchanges. However, one core high volume information exchange is the web-based prototype for Citizen Access to CAIVRS and the user authentication method to support the prototype.

Department of Justice (DOJ) is one of the co-founders of NIEM, and as such plans to continue supporting NIEM and the development of information exchange standards. The development of the Logical Entity eXchange Specification (LEXS) and the Law Enforcement National Data Exchange (N-DEx), and the Suspicious Activity Report (SAR) Information Exchange Package Document (IEPD) are the latest examples of DOJ's support for information sharing and exchange. As an organization, DOJ has a far reach with exchanges of information across a broad set of federal, state, local, and tribal partners.

Department of Labor (DOL) reported that there is a potential opportunity for the use of NIEM for the Farm Labor Contractor Certification. DOL's Wage Hour Division (WHD) exchanges information with the Federal Bureau Investigation (FBI) for the processing of FD-258 form data (Applicant Fingerprint Card) according to the detailed specification of an exchange (Agency Information Sharing Functional Standards -Template 3). This process is currently a heavily involved manual process and DOL believes

[6] More information on the Federal IT Dashboard may be found here: http://www.itdashboard.gov

that a highly automated exchange mechanism through an exchange standard like NIEM will result in a huge benefit for both DOL and FBI.

Department of the Interior (DOI) has decided to adopt NIEM to address the challenge to a tourist in researching recreation sites that are provided by distinct bureaus with varying activities and entry requirements. The solution is an information exchange between the Recreation Information Database (RIDB) and the National Recreation Reservation Service (NRRS) with a tourist interface on Recreation.gov to centralize all research on recreation sites.

Department of the Treasury (TREAS) has identified multiple initiatives where NIEM could strengthen the gathering of Bank Secrecy Act (BSA) data from financial institutions, through e-filing, and further distribute BSA data to authorized stakeholders. NIEM would provide a framework to define of a common schema that enables Financial Crimes Enforcement Network (FinCEN) to communicate with a wide variety of private sector industries and government stakeholder communities providing a universal language while preserving data integrity. FinCEN would have the ability to and support law enforcement, intelligence, and regulatory agencies through sharing and analysis of financial intelligence. The NIEM framework would also support Treasury in building global cooperation with counterpart Financial Intelligence Units. This cross domain exchange has a high potential for reuse across several federal agencies.

Department of Transportation (DOT) is committed to using NIEM to standup a department-wide capability to manage and share Suspicious Activity Reporting (SAR) information. The value expected is DOT's full participation in the Nationwide SAR Initiative (NSI), and ultimately to contribute in preventing another terrorist-type surprise attack on the nation. The information exchange at DOT is considered to be of high-value. Currently, DOT creates SAR information, and stores this information in five different databases. Participation in the NSI is a priority of the National Security Staff and as such is seen as a high impact exchange.

General Services Administration (GSA) chose an information exchange in support of GSA's core mission of providing products and services to other federal, state and local government agencies for its cross domain assessment. The exchange for On-line Representations and Certifications Application (ORCA) eXtensible Markup Language (XML), a business-to-business component system of the Integrated Acquisition Environment (IAE), is designed to replace the paper-based process for handling representations and certifications. Previously, vendors had to submit representations and certifications for each individual large purchase contract award. Now, using ORCA, a vendor can enter its representations and certifications information once for use on all federal contracts. This cross domain exchange has a high potential for reuse across all federal agencies.

National Science Foundation (NSF) will use NIEM for the Research Performance Progress Report (RPPR) which is a new uniform format for reporting performance progress on federally-funded research projects, resulting from an initiative of the Research Business Models Subcommittee of the Committee on Science. The RPPR will be used by agencies that support research and research-related activities for use in submission of interim performance reports. It is intended to replace other interim performance reporting formats currently in use by agencies.

SUMMARIES OF THE AGENCIES REQUIRING FURTHER EVALUATION

Department of Defense (DoD) has indicated it will require further evaluation of NIEM. The assessment from DoD included a cross domain exchange for Improved Improvised Explosive Device Defeat Information Sharing as part of the DoD Net-Centric Data Strategy; however NIEM was not

referenced for this exchange. DoD and the Intelligence Community (IC) will adopt a position with respect to UCore and NIEM that considers the multiple elements when deciding to use NIEM and/or UCore to develop data standards and information exchanges.

Department of State did not submit an official response but has stated via email that they are evaluating the use of NIEM for cross domain information exchanges specific to travel related documents from Consular Affairs. There is potential for cross-boundary information exchange with Customs and Border Protection in validating passport and visa information.

Department of Veterans Affairs (VA) evaluated three mission related-information exchanges and contends that the Federal agencies in the healthcare domain have several business and technical requirements not currently support by NIEM. The Veterans Health Affairs has described those requirements and proposes an approach by which these agencies may actively collaborate with the NIEM Program Management Office to meet the requirements.

Environmental Protection Agency (EPA) is one partner within the Exchange Network, a national network that includes all 50 states, nine tribes, one territory, and ten EPA Regional Exchange Network Grant Coordinators, in which environmental data is exchanged among trading partners (States, Tribes, other Federal agencies, industry, international) using node and Web Services technology. While EPA sees no current benefit in changing to the NIEM reuse model, the agency will continue to evaluate the use of NIEM.

National Aeronautics and Space Administration (NASA) has the challenge of an extraordinary amount of data, much of which is available for consumption outside of NASA. However, NASA does not have an enterprise-wide governance policy to oversee the definition, integration, and control of this data. The agency uses its Integrated Enterprise Management Program (IEMP), which manages transformation of financial, physical, and human capital management processes, and its relationship in exchanging information with Contractor Financial Management systems. NASA uses five process groups that make up the NASA Office of the Chief Information Officer's (OCIO) strategic lifecycle. A more thorough review of NIEM and its ability to address NASA's information exchange development needs will be conducted throughout the year

Office of the Director of National Intelligence (ODNI), on behalf of the Intelligence Community (IC) identified a cross domain exchange for enterprise audit capability for audit collection and audit sharing in support of statutory and analysis requirements of the Counterintelligence (CI), Information Assurance (IA), Information Sharing (IS), Intelligence Community Oversight (ICO), and Law Enforcement (LE) communities with consideration of privacy concerns to enable an enterprise wide audit exchange. The enterprise audit exchange was designed using NIEM Naming and Design rules and will be contributed to the NIEM Program Management Office. The DoD and IC will adopt a position with respect to UCore and NIEM that considers the multiple elements when deciding to use NIEM and/or UCore to develop data standards and information exchanges.

Social Security Administration (SSA) has examined the State Verification and Exchange System (SVES), a high volume system that processed over 599 million requests for information, such as Social Security Number (SSN) Verifications, in FY09. SSA does not believe that the adoption of the NIEM model and processes would be in the best interest of the Agency with regard to all high-volume verifications. SSA will, however, continue to evaluate and incorporate NIEM standards where ever appropriate.

SUMMARIES OF THE AGENCIES REPORTING NO USE OF NIEM

Department of Education (ED), through the Office of Federal Student Aid (FSA), identified no gaps in their information exchanges. FSA currently uses a data exchange standard that was developed jointly with the education community, in association with the Postsecondary Electronic Standards Council (PESC), and there is no current performance gap with this exchange.

National Archives and Records Administration (NARA) was unable to identify any requirements for cross-boundary information exchange, at this time, that would fall under the purview of NIEM. Integration points between the Controlled Unclassified Information (CUI) Framework and NIEM will need to be coordinated when the CUI Framework is finalized.

Nuclear Regulatory Commission (NRC) exchange of data with external entities is document-based or takes the form of mutually accessible databases. NRC is in the process of evaluating areas of opportunity for automated data exchange that would support machine-readable formats. No alternative approaches have been identified.

B. DATA STANDARDS FRAMEWORKS

Our challenges today are often boundary-spanning: they cut across sectors, organizations and units, and require the collaboration of governments, industry, and citizens. Some challenges are long-standing, against which little progress has been made; others are new and arise on Internet-enabled networks. These challenges move quickly and demand anticipation, agile response, and leadership at all levels of organization, from corporals to generals, clerks to managers to chief executive officers.

In a world where problems and opportunities cut horizontally across the assets arrayed against them, our industrial age organizations tend to be vertical and ill-suited to the task. We are caught between the era of paper-driven systems and that of the digital era. We base many of our decisions on the rules of the paper world, not the rules of the digital world. We bound the latitude of workers in ways that fetter the discretion, inventiveness and innovation required for today's complex challenges. The performance of organizations in shared mission efforts is difficult to parse, and accountabilities hard to ascribe. Yet there is no longer money simply to throw at problems without the promise of results.

The United States, for example, fragments health and human service programs, from Medicaid to veterans' services, many administered through the states, and costing $420 billion annually. Our stove-piped systems are unable to interoperate. At the enterprise level, systems cannot provide a common operating picture of all providers and services that may be arrayed around a particular beneficiary across all those programs – or to take an enterprise view of what works.

Where the mergers of platforms, people and organizations are possible, they have proven slow, costly, unpredictable, and difficult to wage. However, standards for information sharing and exchange, and governance across shared mission enterprises comprise of boundary-spanning solutions that can achieve many of the same effects in less time, at lower cost, and with the promise of improved performance. Such approaches are just right for the networked age: quick, light, and providing consistency across multiple views and inputs.

- *Standards reduce complexity.* Customs and Border Protection and the Department of Homeland Security, for example, have over one thousand point to point connections between their legacy systems. By using standards, they now have over 100 reusable information exchanges. This constitutes a move from a collection of point to point

exchanges that are managed independently down to a much smaller number of centrally managed, controlled, and reused interfaces, all enabling the mission.

- *Standards enable data in one place to be repurposed elsewhere.* E-Verify, for example, link the Social Security Administration with the Department of Homeland Security to help employers determine the eligibility of their employees to work in the United States.

- *Standards enable the creation of a common operating picture.* This ability provides agencies to create common operating pictures of clients or beneficiaries where many agencies have some of the picture, but none has it all. The National Center for State Courts, for example, partners with the Administration for Children and Families in Health and Human Services to do 360 degree interventions for abused children. There may be information in school databases or family welfare, probations, or child support systems that can be integrated into the common operating picture of a client. With standards to create a unified client-centered view, agencies can collaborate to ensure more effective interventions on behalf of their clients.

- *Standards drive time savings and cost avoidance to deliver new information services.* By reusing standards, federal agencies have been able to realize savings of 10% to 30% in development time and cost, from planning stage to design stage.

- *Standards encourage innovation.* By describing fundamental requirements; government controls its core intellectual property, keeping it in the public domain. Industry moves to competition on value-added services, not fundamentals.

- *Standards enable a much clearer enterprise-level view of performance metric and associated results.* With cross-enterprise data, managers can aggregate results, and ascribe them to different contributing organizations and jurisdictions. That gives executives a much clearer view of who is doing the work, what's working, and what would be worth doing next.

The public sector, due to its scale and scope, and the federated nature of our democracy (federally by agency-bureau-program; as well as by level – federal, tribal, state, and local), have pursued standards and information exchange as a core tool to realize cross cutting mission objectives.

THE NATIONAL INFORMATION EXCHANGE MODEL (NIEM) AS A FRAMEWORK

The Department of Justice (DOJ) and the Federal Bureau of Investigation (FBI) have been at the forefront of national scope information exchange using standards since the 1970s. In the early part of this decade, DOJ, in partnership with their advisory group Global Justice Information Sharing Initiative (Global) developed the Global Justice Information Sharing Model (GJXDM). GJXDM consolidated and replaced several eXtensible Markup Language (XML)-based vocabularies and captured the idea of packaging data standards in a functional or mission context. Effective information exchange and reuse happens first in a mission context, and second through planned or serendipitous reuse of mission-based exchanges.

In 2005, in response to maturation of the Federal Enterprise Architecture (FEA), supporting implementation of the Clinger-Cohen Act of 1996 and the E-Government Act of 2002, and its Data Reference Model (DRM) as well as the Intelligence Reform and Terrorism Prevention Act (IRTPA), DOJ and the Department of Homeland Security (DHS) came together with Global to partner to build and deliver the National Information Exchange Model (NIEM). NIEM provides an information exchange

process and framework consistent with the FEA DRM with the mission to solve the cross-boundary problem through use of standardized exchange. NIEM addressed three major conceptual issues as well as a host of more technical and incremental enhancements. First, NIEM is federated. This enables inter-operability across multiple domains, with each domain managing its data models and content standards separately, while benefiting from central investment in tools, training, model management, and governance. Domains are collections of data representing the key concepts across a specific mission area. Domains are usually identifiable via recognizable governance or authoritative bodies. NIEM currently has ten domains ranging from international trade to family services. Second, NIEM is hierarchical with a relatively small universal core upon which all participating domains agree. This universal core portion of NIEM contains essential identifying information for basic concepts like person, place, or property, and is the "Rosetta stone" upon which the various domains anchor. Appendix A includes additional information regarding NIEM such as the model and information exchange package process. Appendix B includes additional information regarding NIEM and the FEA DRM.

USE OF EXTENSIBLE BUSINESS REPORTING LANGUAGE (XBRL)

The eXtensible Business Reporting Language (XBRL) is the leading financial reporting standard providing a common reporting format using a common technology standard. XBRL has eliminated the need for companies to report their financial statements in large paper-based documents. It is strongly supported by the accounting industry, and used by the U.S. Securities and Exchange Commission (SEC) and the Federal Deposit Insurance Corporation (FDIC).

Within the United States, XBRL's core value is in the standard taxonomies and data specifications that together define the Generally Accepted Accounting Principles (GAAP). The US GAAP XBRL taxonomy was created in cooperation with the SEC and the Federal Accounting Standards Board. XBRL's design decisions, and defined data taxonomies and related semantics, work well for reporting of complex accounting information. Its use is viewed as successful for both of these applications. Examples of its use in government-centric domains include:

- Federal Financial Institutions Examinations Council (FFIEC), led by the FDIC, created a global repository of bank call reports producing improved data quality, productivity, and monitoring capabilities.

- SEC mandating the use of XBRL for public company reporting following the creation of the U.S. GAAP XBRL taxonomy, which enabled greater comparability and transparency.

Appendix C includes additional information regarding NIEM and XBRL.

USE OF UNIVERSAL CORE (UCORE)

The Universal Core (UCore) was created based on recommendations made by a task force investigating information sharing obstacles between the defense and intelligence communities of interest. An inter-agency effort involving the Department of Defense (DoD) and the Office of the Director of National Intelligence (ODNI) was executed to implement the recommendations by finding a common core of universal terms for its communities' information exchange that everyone could agree on. The common core was required to be extensible, scalable, and implementable.

Through analysis of DoD and ODNI data, the agencies discovered that the core set of messaging data included the concepts of who, what, when, and where. UCore version 1.0 was published following an effort to define the "when" and "where" through community-wide participation. The development of UCore version 2.0 by DoD, ODNI, DHS and DOJ dealt with defining the "what" and "who" concepts. UCore was expanded to include the NIEM centric domains of law enforcement and counter-terrorism. UCore is largely agnostic with respect to the information exchange vocabularies of the various communities.

Because of this, version 2.0 was developed with the goal of providing the ability to supplement the basic UCore exchange with richer, more detailed information content in the form of NIEM "payloads", when necessary, governed by the creation of NIEM Information Exchange Package Documents (IEPDs). The ability to capture the concepts for "who", "what", "when", and "where" was fully realized in version 2.0. More importantly, the effort also provided a collaborative environment for joint NIEM and UCore development. Appendix D includes additional information regarding NIEM and UCore.

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III. FUTURE ENVIRONMENT AND NEXT STEPS

The NIEM program has evolved and matured to address the most pressing information sharing and exchange challenges facing the government today. NIEM has now progressed to a level where it can act as *the* framework for establishing government-wide, cross-domain information exchanges.

The further expansion of NIEM into an increasing number of government agencies and mission spaces will foster new collaboration and exchange of information across organizational boundaries. Agency leaders can utilize the established NIEM framework and lessons-learned to accelerate enterprise integration.

A. FUTURE ENVIRONMENT

POTENTIAL CROSS DOMAIN OPPORTUNITIES

As a result of the collection and analysis of agency FY2011 assessment submissions, a cross domain opportunity matrix was created to represent the information exchange partners of all agencies that have responded to date. The ordinate ("Y" axis) denotes the responding agency, while the abscissa ("X" axis) denotes the identified information exchange partners.

The matrix identifies agencies that maintain a critical role in the federal information supply chain, which subsequently necessitates the need for standardized information exchanges for governmental transactions. Consider the following examples:

- Department of the Treasury (TREAS): The Financial Management Service provides financial services for the federal government such as centralized payment, collection, and reporting services.
- General Services Administration (GSA): Supports the basic functioning of federal agencies through the supply of products and services for federal offices.
- National Archives and Records Administration (NARA): All federal agencies are responsible for submitting records for preservation purposes.
- Social Security Administration (SSA): Acts as the repository for social security number (SSN) inquiries and verification, a touch-point that crosses all federal agencies.

Table 3 - Cross Domain Opportunities Matrix, is a high level representation of common information exchange requirements across the Federal Government. Information exchange partners identified in the assessment responses were captured in addition to information partners crucial in sustaining agency mission-specific activities. This view across the agencies provided a unique opportunity to identify exchanges across these organizations. For example, while SSA responded to the assessment with intent to further evaluate NIEM, other SSA trading partners responded differently regarding information exchange with SSA using NIEM. More steps will need to be initiated by the responding agencies to fully describe these cross-agency exchange opportunities.

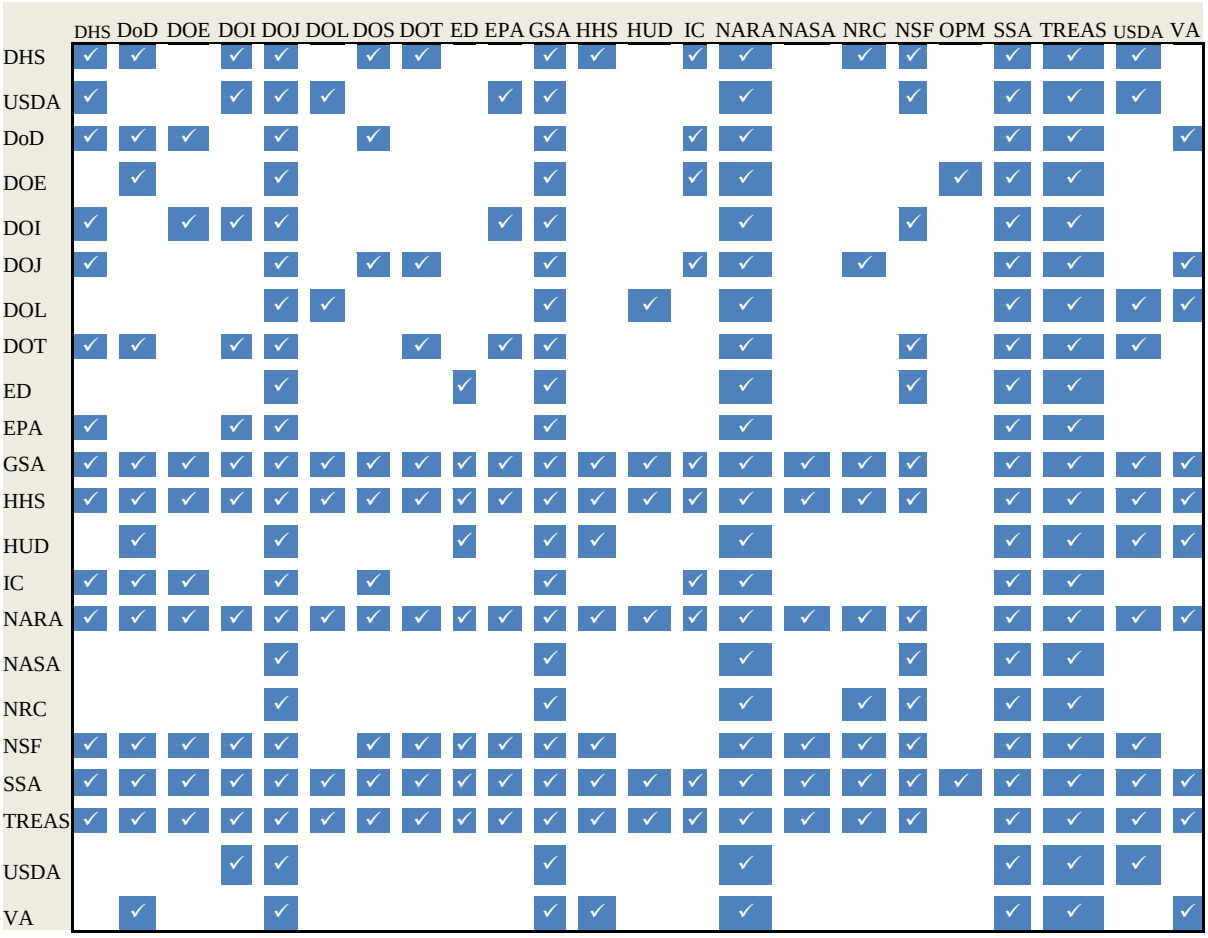


Table 3: Cross Domain Opportunities Matrix

POTENTIAL YET UNDOCUMENTED SUCCESS STORIES

The analysis of the 26 responses has yielded some potential success stories for the use of NIEM for cross domain information exchange. Below are six primary examples where there is a high potential for use of NIEM for cross domain information exchange not included in the OMB assessments.

Department of Defense has indicated that while there are several examples of NIEM used within DoD such as the Naval Criminal Investigative Service DoD Law Enforcement Exchange, it responded that the agency will require further evaluation of NIEM. Their assessment included a cross domain exchange for Improved IED Defeat Information Sharing as part of the DoD Net-Centric Data Strategy; however NIEM was not referenced for this exchange. Both DOJ and DHS are stakeholders in the Improved IED Defeat Information Sharing and have stated that NIEM is their preferred or mandated standard. The DoD-DHS Maritime Domain Awareness Architecture Hub Plan has also established the NIEM Maritime model as the interoperability model for the four information hubs – vessel, cargo, people and infrastructure. DoD could strengthen their response to recognize the appropriate use of NIEM for exchange in the cross-cutting Law Enforcement and Homeland Defense/Security communities.

Department of Education responded in their assessment that their Federal Student Aid (FSA) office has an alternative to NIEM yet describes an XML registry approach which at most could be likened to NIEM model management. The FSA framework provides no guidance on information exchange

development or XML schema reuse of the FSA model. This gap results in a process where end-users of the FSA model are left without the necessary process, guidance and tools to develop truly interoperable exchanges. In addition, the Department of Education assessment does not extend to state and local stakeholders, some of whom have already begun to implement NIEM for local exchanges and have been awaiting opportunities to coordinate with federal programs. Lastly, additional education information exchange initiatives such as the National Education Data Model, the National Center for Education Statistics Common Data Standard initiative, and the Schools Interoperability Framework have not been evaluated for applicability.

Environmental Protection Agency responded in their assessment that the Environmental Network (EN) is a mature information exchange network providing 54 data flows across its federal, state, local, tribal and private sector partners. Not yet articulated in the EPA assessment was the strategy for working within the NIEM framework for cross-domain information exchanges (e.g. with the NIEM Infrastructure Protection Domain and Chemical/Biological/Radiological/Nuclear Domain) and for addressing the enterprise-level challenges that the State of Pennsylvania is facing with using NIEM and the EN. Additionally, potential exists for the EPA to provide chemical and biological-centric content to the NIEM Chemical/Biological/Radiological/Nuclear domain, which currently remains focused on radiological and nuclear-centric content.

National Archives and Records Administration responded in their assessment that they found no immediate need for the use of NIEM. NARA is the executive agent for the development and delivery of a framework for the marking of Controlled but Unclassified Information (CUI). The development of a NIEM pattern aligned to the CUI Framework for use within- and cross-domain information exchanges is a potential missed opportunity.

Nuclear Regulatory Commission responded in their assessment that they found no immediate need for the use of NIEM and provided no alternative approaches. As noted above, the DHS Domestic Nuclear Detection Office (DNDO) has developed a series of information exchanges for radiological/nuclear detection from devices and is the current steward of the radiological/nuclear portions of the NIEM model. The NRC has a potential role in understanding and sharing based on DNDO's enterprise use of NIEM.

Social Security Administration reported that it does not believe that the adoption of the NIEM model and processes would be in the best interest of the agency with regard to all high-volume verifications. However, some agencies reported in their assessment to OMB the potential or current use of NIEM in an information exchange with SSA, such as the Department of Agriculture and the Department of Homeland Security. SSA should evaluate their current interoperability model to properly account for information exchange engagements with partner agencies aligned to NIEM.

PRIVACY

In evaluating the current development of NIEM exchanges, and new cross domain development in the evaluations, the importance of understanding Personally Identifiable Information (PII) across the NIEM community has become paramount. Identification and assessment of PII must also be done in conjunction with compliance with any other laws and policies applicable to this data, including the Privacy Act, prior to any sharing of this data. A significant number of NIEM exchanges contain one or more PII elements requiring appropriate control of the data when exchanged.

In coordination with the Program Manager for the Information Sharing Environment (PM-ISE), the NIEM Program Management Office (PMO) is planning on documenting, after thorough research and

understanding, the elements in NIEM which are explicitly PII and provide recommended methods to ensure awareness by information exchange developers. Based on resources available, it is anticipated that this work would be performed in a cross agency, cross government working group of privacy experts and privacy advocates.

Potential future activities related to the Privacy Working Group could include:

- Identification of Core Elements of NIEM always considered to be PII;
- Identification of secondary elements within NIEM, that when combined, may be considered PII;
- Review current NIEM training for potential augmentation of curriculum related to Privacy and Civil Rights / Civil Liberties concerns; and
- Development of additional documents or artifacts within the information exchange development process that help developers understand impacts of including PII in information exchanges.

DOMAIN DEVELOPMENT STATUS

NIEM continues to grow and mature on several fronts. Various Communities of Interest (COIs) have realized the model's potential not only on a technical level, but in its mature governance structure and community participation. These COIs are making a strategic investment in the program through participation in the domain "stand-up" process. The domains noted below are a sample set that are currently under evaluation for inclusion into NIEM:

Planning and Accountability (Management)
The NIEM Program Management Office (NIEM PMO) is assisting the Department of Health and Human Services (HHS) in support of the of creation of OMB Exhibit 53 and TechStat NIEM-conformant Information Exchange Package Documentation (IEPDs) in support of agency submissions to the Federal IT Dashboard. A NIEM-conformant OMB Exhibit 300 IEPD is anticipated to be created and implemented in the FY2011 timeframe. Elements contained within each IEPD may be used to form a future domain within the model.

Health
The Department of Health and Human Services, Office of the National Coordinator (ONC) for Health Information Technology, is leading the development of a health information exchange framework based on NIEM to support the Nationwide Health Information Network (NHIN). The development includes health information exchange definitions and standards, within the NIEM framework, and use cases for testing transactions. This work will lead to the creation of a NIEM Health domain. ONC has solicited bids from vendors to assist in the creation of a standards and interoperability factory that would provide a consistent information exchange.

Human Services
The Department of Health and Human Services, Administration for Children and Families' (ACF), Office of Child Support Enforcement formally adopted a NIEM-enabled information exchange known as the Child Support and Court/Judicial Message Exchange Data Model. This model was formed from a multi-year collaboration with the National Center for State Courts and the child support enforcement community to automate the exchange of data between child support enforcement agencies and the court system.

This effort formed the foundation of the Family Services domain which was released in September of 2009 as part of NIEM version 2.1. The Family Services domain initially focused on children, but current efforts have refocused the effort more broadly which may lead to the establishment of a Human Services domain. The future plan for the Human Services domain is to build upon the solid foundation provided by the current Family Services domain by including additional support for child welfare and child support due to the child-centric information exchange requirements with the Department of Education, Department of Labor, Department of Agriculture, and Department of Veterans Affairs.

Based on this assessment, NIEM has the potential for strong growth. New communities of interest will explore the possibility of adding content to NIEM to help facilitate information exchange. Consideration of these new activities will be managed by the NIEM PMO. Most notably will be the requirement for the capability for new domains to understand the NIEM engagement model, for better self-service tools for domains that will allow the program to scale, and concerns on expanding effective governance.

SEMANTIC WEB EXPLORATION

The NIEM PMO endeavors to maintain its cutting edge while ensuring all technological decisions made do not adversely affect the current NIEM domains and communities of interest, or detract from the overall value of the model. Changes to the NIEM model, whether on a business or architectural level, must bring value to the domains and communities currently represented. Strong governance prevents the program from moving too fast and too far ahead of its stakeholders.

Recently, the NIEM PMO started a dialogue with semantic web technology advocates, including Sir Tim Berners-Lee, the inventor of the World Wide Web, to learn more about the semantic web and how it aligns with NIEM. His vision, as stated in 1999, "I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web – the content, links, and transactions between people and computers. A 'Semantic Web', which should make this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines."

The strategy of semantic web was discussed including current usage within the federal government, through implementation of Data.gov. The NIEM PMO has taken the following action items to understand and assess where semantic web aligns with the goals of the NIEM program:

- Better understand the technological underpinnings of the semantic web;
- Understand open versus closed information exchange and development constraints within the semantic web context;
- Determine a path to implement the NIEM model in a Resource Description Framework (RDF) format;
- Understand, articulate, and communicate the incentives of moving to the semantic web;
- Understand the tools available that support the RDF format;
- Assess how time and resources will be invested in determining the technical evolution of the model; and

- Identification and assessment of applicable legal issues concerning NIEM exchanges and cross domain development.

With the expansion of Data.gov and expanding conversations on Linked Data, the importance of understanding higher level information architecture frameworks will rise to the top of the conversation across government agencies. In FY2011 it is expected that NIEM PMO will be working towards understanding of the capabilities of semantic web through a Resource Description Framework (RDF) representation of the NIEM framework.

B. NEXT STEPS

As noted above, 22 agencies and 4 Lines of Business have submitted their evaluations to the Office of Management and Budget. A summary of responses, see Table 4, is repeated here for consideration of next steps:

INITIAL RESPONSE	NUMBER
Committed to Using NIEM	12
Further Evaluation Required	8
Will Not Use NIEM	6

Table 4: Summary of Response

Many opportunities exist to develop consistent policies, processes, and governance capabilities, with regard to agency information exchange, each supporting the establishment of common definitions of data and information available within each agency. Agencies would be able to identify high-value information assets by mission capability, foster new cross-boundary sharing and collaboration, and establish new information exchanges.

Moving forward from this assessment, several actions should be taken by agency and line of business leadership to solidify their strategies for NIEM implementation:

1. *Establishing centralized governance.* A few agencies have an existing information exchange model with varying levels of governance in practice today. However, some agencies lack coordination amongst the various components that make up the enterprise which results in semantic overlap and lack of common standards. This lack of coordination would be remedied through the evaluation and adoption of the NIEM framework. Agencies should assess their current governance structure and identify a target state that aligns with the NIEM framework's governance best practices. Additionally, a centralized governance plan should be created that demonstrates the agency's commitment in ensuring that their information exchange model doesn't become obsolete due to inadequate governance. Specifically, they should consider:

    - NIEM governance capabilities in program management of the technical, business and communications aspects of the agency specific information exchange with consideration of federal, state, local, tribal, or private organization stakeholders as representation should be inclusive to their needs as well as the agency's needs; and

    - NIEM reuse capabilities in establishing a repository, whether model or mission specific, to allow for the search and discovery of implemented information exchanges while a central authority, e.g. Program Management Office, maintains governance over the expected artifacts and quality that comprise the information exchange and enhance the ability for reuse to occur.

2. *Developing and implementing information exchange guidelines.* Agencies should develop NIEM implementation plans to identify the relevant strategies and steps towards integrating the NIEM framework into their information exchange practices. They should:

    - Evaluate key information exchange programs, policies and institutional procedures as candidates for NIEM integration. For example, although agencies have a well-defined Systems Development Life Cycle (SDLC) for system delivery, only some have a defined process for information exchange development or a 'go-to' standard for exchange development;

    - Determine gaps in information exchange knowledge and attend requisite training based on agency role;

    - Adopt established best practices and experiences from other agencies that have implemented the framework for inclusion into the NIEM implementation plan; and

    - Participate in community discussion; stay engaged in the framework.

3. *Creating collaborative sharing agreements*. Agencies do not always have the right points of contact within external agencies – which can hinder interagency collaboration. In addition, agencies do not have a complete understanding of what an external agency has available to share to enable improved decision making and mission performance. Agencies should:

    - Assess and develop an inventory of data and information exchange assets that are available within their agency and department/bureau organizations;

    - Categorize the assets by mission to ensure alignment with stated agency goals and to demonstrate value; and

    - Develop a methodology and guidance for standardizing agency sharing agreements, with respect to the agency's identified data and information assets, thereby enhancing mission performance and increasing efficiency by establishing critical information flows, and identifying areas requiring legal compliance.

4. *Developing enterprise data management maturity*. Data management and information exchanges are essential to effectively share information across agencies. Sound data management practices provide the architectural foundation for the information that is to be exchanged by making the underlying data visible, accessible, understandable and trusted. Agencies should:

    - Identify and document their data management organizational structure at the agency and department/bureau levels;

    - Develop, assess, and document their Data Management Maturity level across agency and department/bureau levels; and

    - Assess operationalization of the Data Reference Model by:

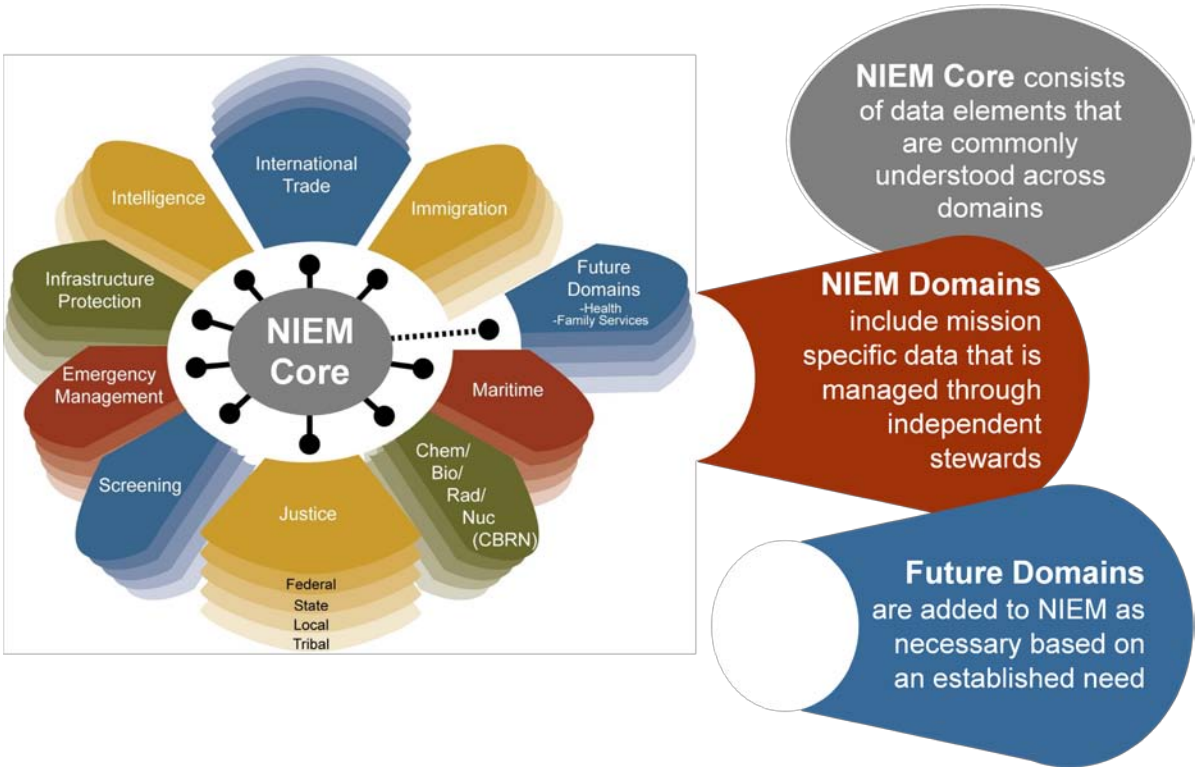
        - Documenting and sharing the agency-wide Enterprise Conceptual Data Model

- Documenting and sharing the agency-wide Enterprise Logical Data Model
- Mapping the agency-wide Enterprise Logical Data Model to NIEM, or an agency specific information exchange model.

5. *Completion of Evaluations*: Agencies currently evaluating the NIEM framework within the context of their current architecture and processes should drive those evaluations to completion. The outcomes of current evaluations should be provided to OMB within six months.

APPENDIX A: OVERVIEW OF THE NATIONAL INFORMATION EXCHANGE MODEL

A. NIEM, THE MODEL



The National Information Exchange Model (NIEM) is a logical data model, or common vocabulary, of terms that is mutually agreed upon through a rich governance process of practitioners at all levels of government and private industry. The model is comprised of the NIEM core, which contains elements that all parties much agreed to regarding the semantic and syntactic representation. Tightly coupled to NIEM core are NIEM domains which include mission specific data that is managed through independent stewards with cross jurisdictional representation. All elements in the domain are extensions of the NIEM core. NIEM is used through the process of developing an Information Exchange Package Document (IEPD), using NIEM tools, to document a discrete information exchange for reuse across a larger community or mission space.

B. IEPD DEVELOPMENT LIFE CYCLE

The Information Exchange Package Documentation (IEPD) Life Cycle is a methodology that guides the development of an IEPD for NIEM conformant information exchanges, see Figure 1. This

methodology evolved through the grassroots efforts by NIEM practitioners and closely mirrors that of a Systems Development Life Cycle (SDLC). The IEPD Life Cycle is a best practice, which defines the steps required to identify and document information exchange use cases and requirements, develop an IEPD, and make it available for search and discovery.

In total, the life cycle is comprised of six major phases, including:

- Scenario Planning
- Analyze Requirements
- Map and Model
- Build and Validate
- Assemble and Document
- Publish and Implement

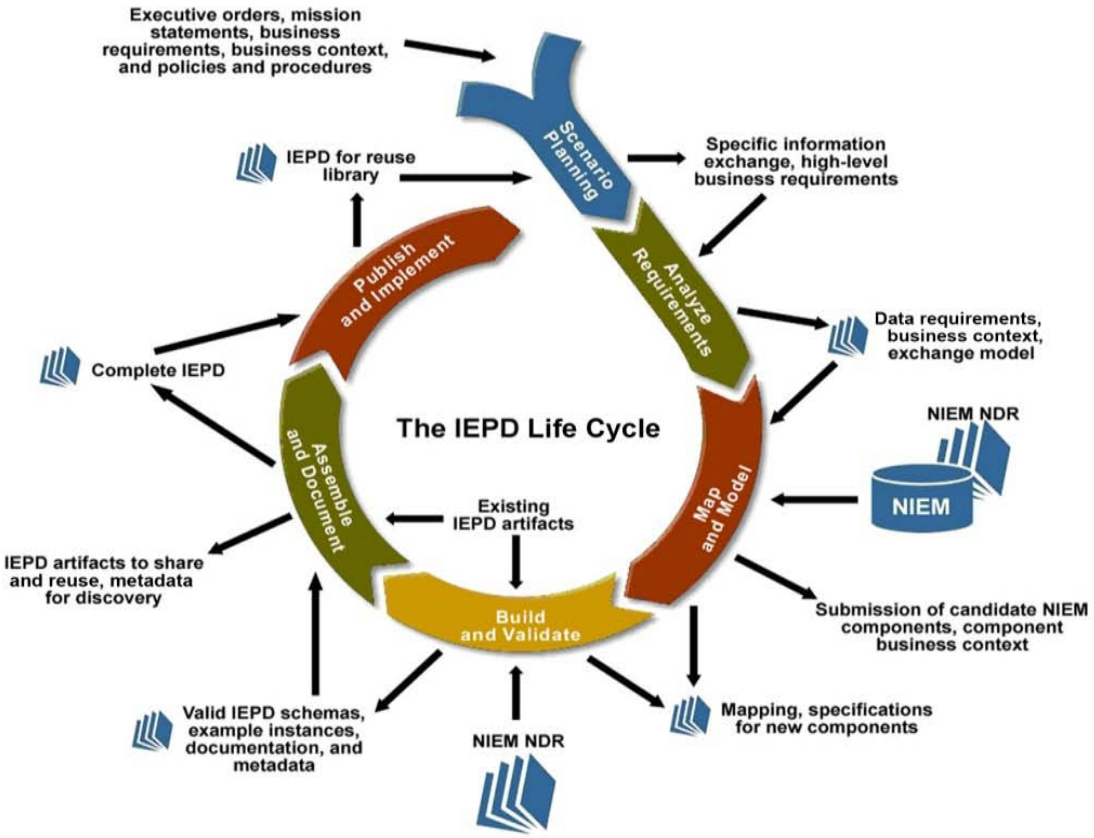


Figure 1 – IEPD Life Cycle

The IEPD Life Cycle is closely coupled with the phases of an agency's SDLC process, see Figure 2.

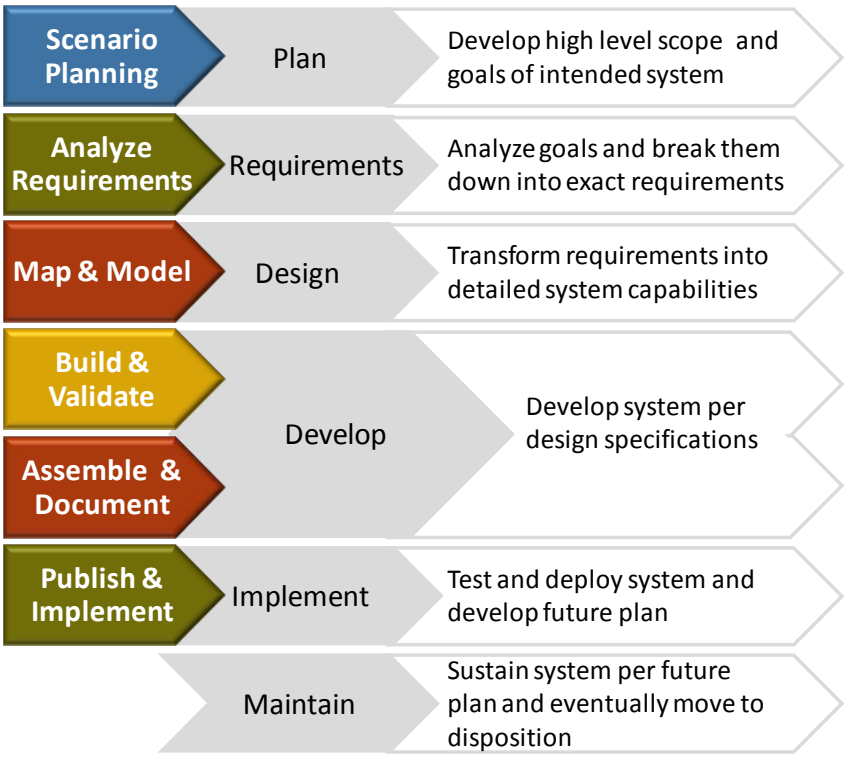


Figure 2 – SDLC / IEPD Life Cycle Coupling

Each of these phases has multiple associated deliverables, some required and some optional. See Figure 3 below for a list of deliverables associated with each life cycle phase. Please note that the items in bold are considered required artifacts by the NIEM community.

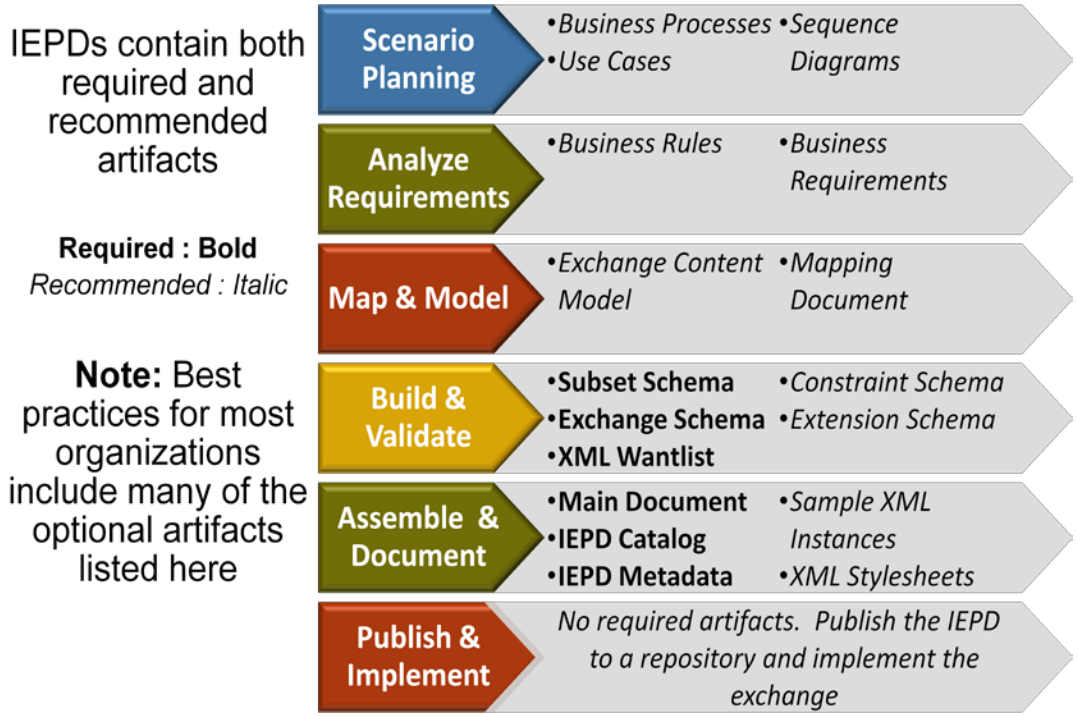


Figure 3 – IEPD Artifacts by Phase

These artifacts are beneficial to organizations because they:

- Ensure consistency across IEPDs;
- Capture business context that facilitate search and discovery of NIEM data components and IEPDs;
- Provide both machine-readable and process-able versions to automate support for the IEPD life cycle; and
- Encourage and facilitate commercial tool development and value-added capabilities.

SCENARIO PLANNING

The purpose of the Scenario Planning phase is to complete the initial tasks associated with defining an information exchange. Before business rules and requirements are developed in the next phase, the project team should have a complete understanding of the business processes surrounding the information exchange. This understanding of the business processes involved in the exchange is the intangible output of the Scenario Planning phase and is supported by the technical artifacts created in this phase.

ANALYZE REQUIREMENTS

The purpose of the Analyze Requirements phase is to define the business rules and requirements for the information exchange. These business rules and requirements will be used to set expectations for the exchange as well as set constraints around how the data will be formatted and used in the exchange.

These rules and requirements are a direct result of the work complete in the first phase: Scenario Planning. The specifications for an information exchange defined within the use cases, business process diagrams, and sequence diagrams are used as inputs to this phase.

MAP & MODEL

The purpose of the Map and Model phase is to create an exchange content model based on the design specifications and business requirements of an information exchange and then map the data elements from this exchange content model to data elements within NIEM. This phase is a critical step in the process of moving from requirements to actual design of the data structures to meet these requirements.

BUILD & VALIDATE

The purpose of this phase is to create the XML schemas that will be used within an exchange to structure the data for the exchange. Implementers will use the exchange content model and mapping document created during the last phase as inputs into the schemas being created for this phase. Implementers will use the mapping values entered into the mapping document as a reference when generating a subset schema for the exchange. All elements within an exchange that directly map to an element in NIEM will be included in the subset schema. As a result of this phase, XML schemas will be generated from tools, or hand-coded, to meet the needs of an exchange.

Required Deliverables

XML Schemas: XML documents used to structure and constrain the data that will be used within an exchange. For a NIEM-conformant information exchange, four schemas are usually created: exchange, extension, subset, and constraint schemas. Extension and constraint schemas are not required within an IEPD though as there may be no extensions or additional constraints for a specific exchange.

Exchange Schema: Used as an entry point for validation of an XML instance and contains the root structure of a message.

Extension Schema: Defines the data types and elements used by an exchange that extend but are not contained within NIEM.

Subset Schema: Set of schemas that contain a specified subset of NIEM elements and types needed for an exchange.

Other XML Documents: Additional XML documents are included within an IEPD besides the four types of schemas. The other XML documents included are a wantlist, XML instance and stylesheet.

Wantlist: Used to specify the elements and types from NIEM that will be used in the subset schemas for an exchange.

ASSEMBLE & DOCUMENT

The purpose of this phase is to complete documentation for an IEPD and then assemble the artifacts into a completed IEPD. At this point in the development process, all of the technical artifacts should be completed and ready for inclusion within the IEPD. The IEPD Master Document and exchange Metadata still need to be completed in this phase. Once this documentation is completed, the IEPD artifacts are assembled into a self-contained zip file.

Required Deliverables

IEPD Main Document: A document that captures a detailed description of a specific IEPD and its artifacts, including business and technical context. The IEPD Master Document contains the scope and purpose of an information exchange as well as the design specifications for the information exchange.

IEPD Package: Collection of IEPD artifacts organized into a zip file with a standard naming convention and file structure. The IEPD package is a stand-alone specification for an information exchange that can be reused within other related information exchanges.

IEPD Metadata: Information that describes characteristics of an IEPD such as the author and organization.

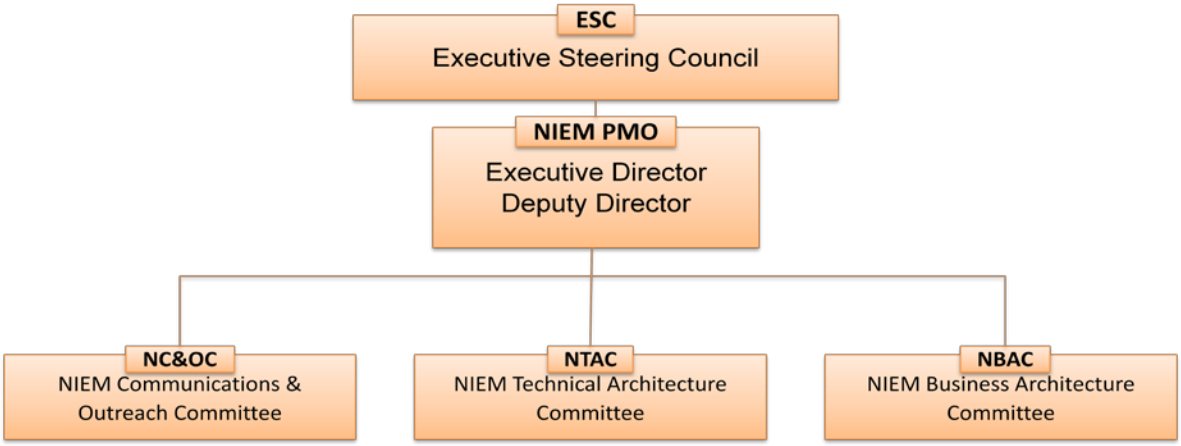
IEPD Catalog: An HTML catalog file that opens in a standard browser and indexes the contents of the IEPD Archive Package. By unpacking the archive and opening the catalog file, a user can browse through the entire package. Furthermore, the specification for the catalog is formal enough that the format and purpose of each file in the IEPD can be distinguished. This means that a NIEM IEPD could be machine-processed for various automated purposes.

PUBLISH & IMPLEMENT

The purpose of the last phase in the IEPD Life Cycle is to publish the completed IEPD to an online repository and then implement the information exchange in the production environment. Publication of an IEPD allows for future discovery of the IEPD by others for use in other information exchanges. Without publication to an internal or external repository, the value proposition of NIEM is diminished as IEPD artifacts are unable to be reused in other information exchanges. Implementation of an information exchange is outside of the scope of NIEM but managers should be aware of their responsibility to implement the information exchange and increase the level of information exchange in their organization.

C. NIEM GOVERNANCE

NIEM governance is necessary to manage processes and to support the NIEM infrastructure. Governance is important in maintaining controlled growth, managing and supporting the NIEM infrastructure and supporting harmonization practices. NIEM is jointly managed at an executive level by the Department of Homeland Security (DHS) and the Department of Justice (DOJ), and its governing structure is comprised of federal, state, local, tribal and private organizations. The figure below outlines the overall NIEM governance structure.



Executive Steering Council (ESC) – The ESC provides executive leadership and direction to parties associated with NIEM. The ESC also advocates for NIEM in Federal, Local and State entities and assists the NIEM PMO in securing funding and resolving policy issues. Establishing national priority exchanges is also another important concept of the ESC authority. The ESC consists of key domain representatives and authoritative stakeholders.

NIEM Program Management Office (NIEM PMO) – The NIEM PMO executes the vision of NIEM established by the ESC, while managing the day-to-day operations of NIEM. The NIEM PMO encourages the adoption and use of NIEM and manages all working group and committee activities. The NIEM PMO coordinates with Communities of Interests (COIs), principal stakeholders and other information exchange initiatives to promote collaboration and interest in NIEM priorities.

NIEM Communications and Outreach Committee (NC&OC) – The NC&OC collaborates to ensure that information regarding NIEM is consistently and effectively communicated to key decision makers. The NC&OC serves as the central point of contact for users, developers, and those interested in learning more about NIEM through the identification of appropriate communication channels and the delivery of audience-specific messages tailored to the strategic directions established by the ESC and the NIEM PMO.

NIEM Technical Architecture Committee (NTAC) – The NTAC works to ensure the robust and effective development of the NIEM core structure, technical architecture and processes to support NIEM and enable users to efficiently use and re-use NIEM objects and NIEM-conformant IEPDs. The NTAC provides technical support, tools and a methodology to implement the business-driven exchanges proposed by the NBAC, and advises the NIEM PMO in the development and enhancement of these tools. The NTAC ensures that all content in NIEM appropriately conforms to the NIEM architecture and the NIEM Naming and Design Rules (NDR), while reconciling data security, privacy and sensitivity issues through technical solutions.

NIEM Business Architecture Committee (NBAC) – The NBAC advises and supports the NIEM PMO on operational and business issues associated with NIEM development and implementation. The NBAC helps facilitate the building of NIEM core objects and manages the harmonization and reuse of NIEM objects across domains and COIs. The NBAC develops processes to ensure that NIEM meets the diverse and evolving business needs of relevant domains and COIs, and expands the scope of NIEM to incorporate additional domains to reflect the evolution and expansion of NIEM.

In addition to the governance supported through the NIEM organizational structure, NIEM Domain Governance is another facet of the overall NIEM Governance Model. NIEM is organized into mission based domains. A domain refers to a business enterprise broadly reflecting the agencies, units of government, operational functions, services, and information systems that are organized or affiliated to meet common objectives.

- NIEM domains are mission-based and organized to facilitate governance, and each has some measure of compliance;
- Domain stewards are community members responsible for actively managing and updating their community's data model; and
- Each domain traditionally includes a cohesive group of domain stewards who are part of a Community of Interest.

D. NIEM TOOLS

NIEM provides a reference set of tools freely available with each NIEM release. The tools implement all of the structural and content features of the release, including the NIEM NDR. NIEM's well-defined interfaces and output products also support the development of independent third-party tools.

NIEM Tools	Description	IEPD Life Cycle Phase
Universal Modeling Language Tools (UML Tools)	UML tools are used to provide an efficient way of modeling data object components, their attributes and their dependencies	Scenario Planning Map and Model
ArgoUML	ArgoUML is an open source, non-NIEM.gov modeling tool that provides support for all standard UML 1.4 diagrams. The ArgoUML can be used to develop the exchange content model (or domain model) and used to take an XMI export of the model that can be uploaded by the tools available on NIEM.gov	Scenario Planning Map and Model
NIEM Data Model Browser	NIEM Data Model Browser enables the user to graphically explore the NIEM model and relationships between data components and elements	Map and Model

NIEM Wayfarer	NIEM Wayfarer is a non-NIEM.gov application as an alternative to the SSGT for browsing the NIEM model	Map and Model
Subset Schema Generation Tool (SSGT)	The SSGT enables a user to select the elements and types required for a data exchange and to save or reload the selection in a "want list" file. The user can then generate a conformant schema subset of the full NIEM reference schema set using the saved want list. All dependencies are automatically added to ensure that the resulting schema subset is valid. The user requirements can be saved and reloaded in a "want list" file. This tool is used in the Map and Model and Build and Validate phases of the IEPD Life Cycle.	Map and Model Build and Validate
Component Mapping Template (CMT)	The CMT is a spreadsheet that COIs use to facilitate and document the mapping of their data-component requirements for a particular business exchange or family of exchanges to data components in NIEM. It identifies and characterizes similarities and differences between NIEM and the COIs' data-component requirements.	Map and Model
NIEM Mapping Tool	With this tool, you will create an exchange, associate a exchange model with that exchange, map the exchange model to NIEM, and generate artifacts – such as mapping reports, wantlists, and schemas – based on that mapping	Map and Model Build and Validate
Code List Schema Tool	The Code List Schema Tool is used to create a NIEM-conformant schema enabling an application to validate XML data against a list of restricted values.	Build and Validate

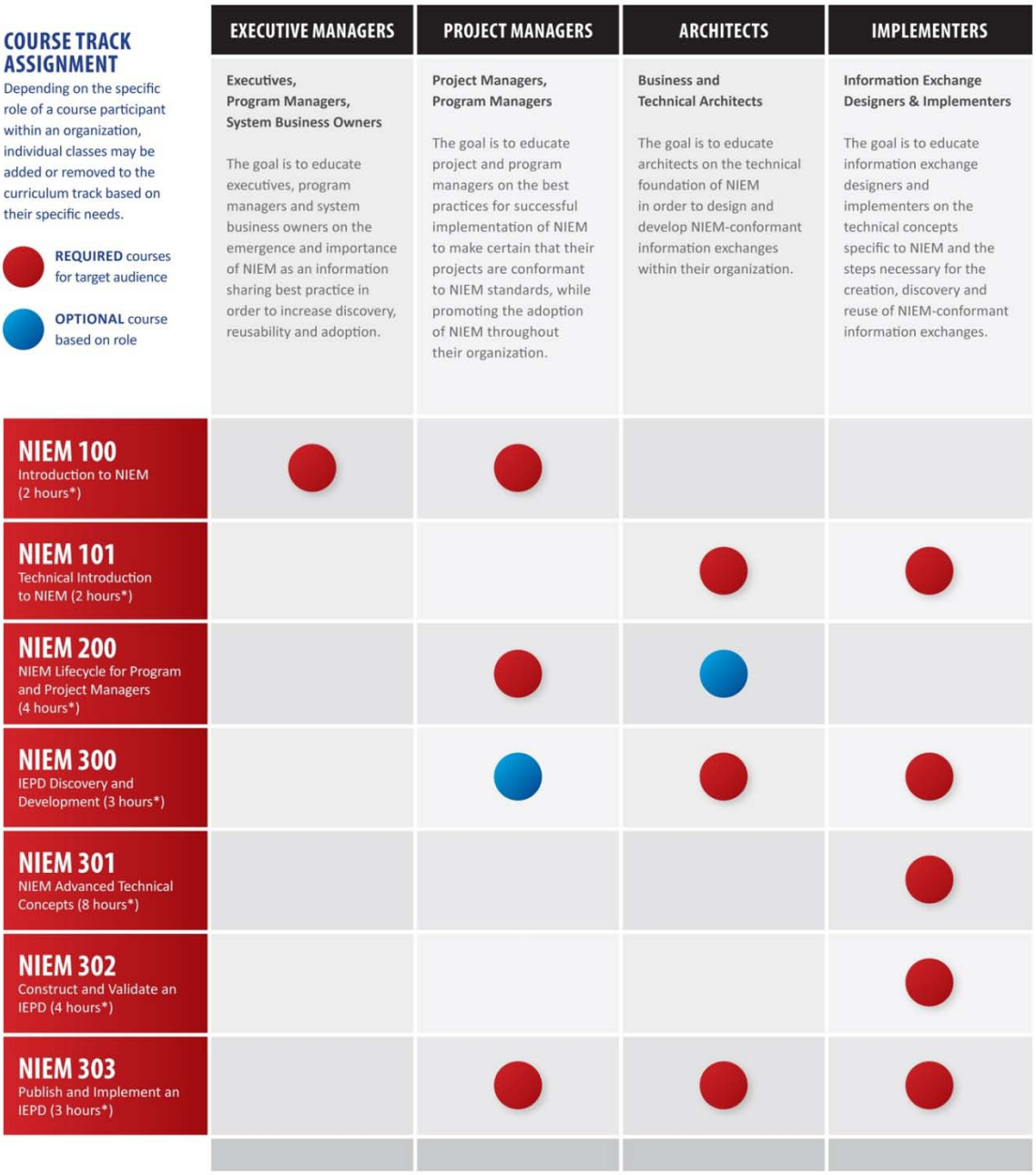
NIEM Conformance Tool	The NIEM Conformance Validation Tool is used to test an IEPD or a schema's conformance to the NIEM NDR 1.3 rules. A results spreadsheet is generated with a pass, fail or manual review option is presented to for each of the files	Build and Validate
Migration Assistance Tool (MAT)	The NIEM Migration Assistance Tool helps convert a GJXDM 3.0.x or a NIEM 1.0 wantlist to a NIEM 2.0 or a NIEM 2.1 wantlist	Build and Validate
IEPD Tool	The IEPD tool enables the user to upload or enter the artifacts required for an IEPD and assembles into a package according to the IEPD specification. It can also validate that minimum artifacts and metadata are present. In addition, this tool will be extended to capture and track business usage context at the data-component level as well as at the IEPD level. IEPDs and data components will relate through their business context.	Build and Validate Assemble and Document
Justice Information Exchange Model (JIEM) Tool	The JIEM Modeling Tool is a non-NIEM.gov application that helps model business processes with best practices, documenting requirements for electronic information sharing, capturing both the information content and business context of the information exchanges	Scenario Planning Analyze Requirements
Content Assembly Manager (CAM)	A tool that ingests an XML schema, extracts rules, structure and annotations. Users are now able to select objects that are needed by the information exchange and save the generated wantlist and subset schema. This tool is also capable of generating rich live test data (based on a rules engine) that can be validated against the IEPD schemas. This tool works well when IEPDs are being implemented	Map and Model Build and Validate Assemble and Document

IEPD Factory	A NIEM graphical schema modeling tool built on top of Troux Architect. Once the information exchange is modeled, a wantlist, exchange, extension and constraint schemas are generated	Map and Model Build and Validate Assemble and Document
IEPD Factory Document Generation Tool	Once an IEPD Factory model has been created, it can be consumed by the Document Generation Tool to produce a Component Mapping Template (CMT), Sample XML Instance, a Data Dictionary and a Domain Template	Build and Validate Assemble and Document
Developer-centric IEPD Tool (IEPDResync)	Users can view exchange and extension schemas in a schema type hierarchy and a schema file hierarchy. Types and elements are organized in tree views. Schemas can be edited in source format or property format. Users can find and navigate to the exchange and NIEM subset schema types and elements easily. The tool can generate a Component Mapping Template and UML class diagram in XMI format.	Map and Model Build and Validate Assemble and Document
Synthetic Data Generation (SDG)	The SDG is a tool to aid in the testing of an implementation through the generation of "safe" test data.	Build and Validate Publish and Implement

E. NIEM TECHNICAL TRAINING

The NIEM training materials provide the knowledge and know-how stakeholders need to use the tools and other capabilities. The business value of NIEM will be conveyed to participants as well as its history and current use.

The full NIEM training curriculum is as follows (Note, an intermediate level of XML is a prerequisite for the implementer course):



F. NIEM HELP DESK AND TECHNICAL ASSISTANCE

NIEM has established the National Information Sharing Standards (NISS) help desk[7] to serve as the entry point for stakeholder questions and issues. The help desk assists users in finding answers to their technical questions regarding the content, principles, and best practices for using NIEM. Help-desk activities include, but are not limited to:

[7] The help desk can be accessed at http://www.niem.gov/contact.php

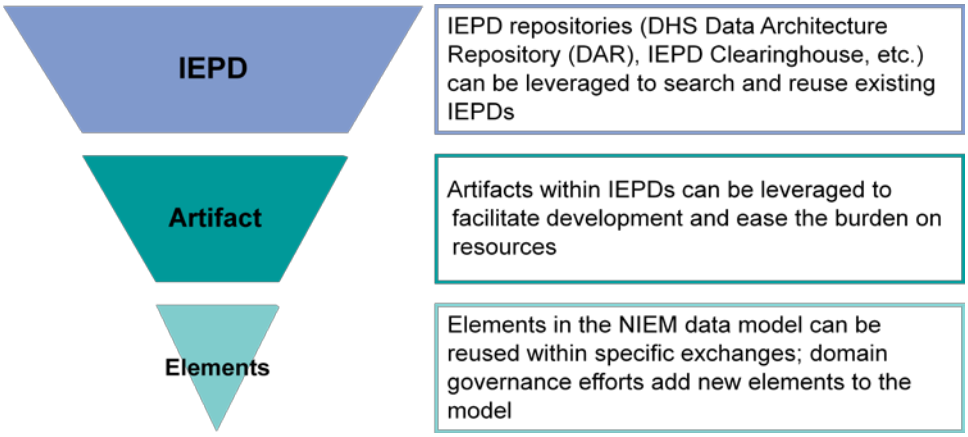
- Posts mostly commonly received questions to a knowledge base for stakeholder reference;
- Provides online support via the Internet and e-mail as well as real-time telephone support; and
- Addresses specific questions or implementation needs in the field with respect to NIEM exchange development or participation. Technical assistance guides organizations through the IEPD process.

G. NIEM REUSE MODEL

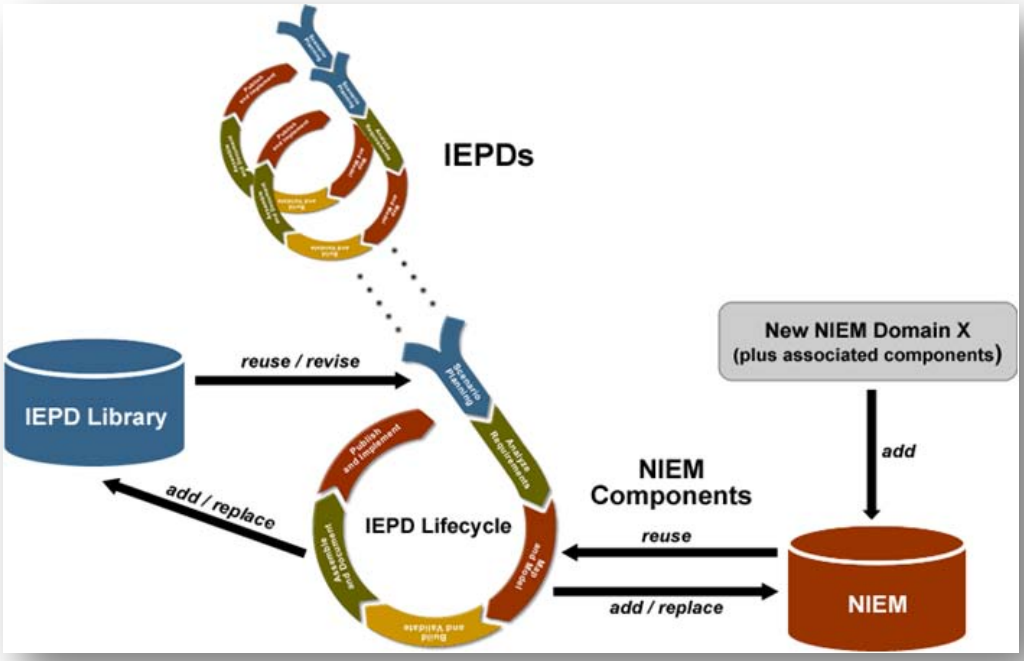
IEPD REUSE AND SHARING

Existing IEPDs, after publication, can be reused in the creation of new IEPDs which can:

- Decrease IEPD development time
- Increase consistency of data definitions



IEPDs and the NIEM Architecture



NIEM IEPD CLEARINGHOUSE

The Information Exchange Package Documentation (IEPD) Clearinghouse, a public facing IEPD Library, provides information on a variety of IEPDs that have been submitted by individuals and organizations who have implemented NIEM.[8]

NIEM NAMING AND DESIGN RULES (NDR) FOR XML SCHEMA REUSE

The Naming and Design Rules (NDR) document specifies XML Schema documents for use with the National Information Exchange Model (NIEM). The NIEM framework is based on the World Wide Web Consortium (W3C) Extensible Markup Language (XML) Schema standard.

NIEM specifies a set of reusable information components for defining standard information exchange messages, transactions, and documents on a large scale: across multiple communities of interest and lines of business. These reusable components are rendered in XML Schema documents as type, element, and attribute definitions that comply with the W3C XML Schema specification.

The W3C XML Schema specification enables information interoperability and sharing by providing a common language for describing data precisely. The constructs it defines are basic metadata building

[8] More information on the IEPD Clearinghouse may be found here: http://www.it.ojp.gov/framesets/iepd-clearinghouse-noClose.htm

blocks — baseline data types and structural components. Users employ these building blocks to describe their own domain-oriented data semantics and structures, as well as structures for specific information exchanges and components for reuse across multiple information exchanges. Rules that profile allowable XML Schema constructs and describe how to use them help ensure that those components are consistent and reusable.

The NIEM NDR specifies principles and enforceable rules for NIEM data components and schemas. Schemas and components that obey the rules are considered to be NIEM-conformant.[9]

[9] More information on the NIEM NDR may be found here: http://www.niem.gov/pdf/NIEM-NDR-1-3.pdf

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APPENDIX B: NIEM AND THE FEDERAL ENTERPRISE ARCHITECTURE DATA REFERENCE MODEL

A. OVERVIEW

The strategic focus of the Federal Enterprise Architecture (FEA) Data Reference Model (DRM)[10] is the enablement of *information exchange* and *reuse of data*. The NIEM framework enables federal agencies to operationalize the critical dimensions of the DRM.

With NIEM, the DRM concepts become immediately actionable. NIEM can be applied within a single agency, within a Community of Interest (COI), or cross-COI.

NIEM provides step-by-step methodologies that integrate governance, processes, templates, tools, training, and other support services to ensure the successful design of information exchanges and reuse of data.

Following is an overview of the DRM and the NIEM alignment to the DRM concepts.

B. BACKGROUND ON THE DATA REFERENCE MODEL

The DRM is one of the five reference models comprising the FEA. The DRM provides a vehicle for establishing a common language within a COI. Additionally, it provides a forum for cross-agency consensus concerning governance, data architecture and information exchange architecture.

This reference model provides guidance to enterprise architects and data architects for the implementation of repeatable processes to enable data sharing in accordance with federal government-wide agreements, including agreements with state, local, and tribal partners, as well as public and private non-governmental organizations.

[10] The FEA DRM 2.0 specification may be located here:
http://www.whitehouse.gov/sites/default/files/omb/assets/egov_docs/DRM_2_0_Final.pdf

The DRM provides business value for agency data centric initiatives by:

Providing consistency in describing data architectures

- The "DRM Standardization Areas" *(see following section)* provide guidance in uniformly describing data artifacts within a COI which increases cross-agency and cross-COI data sharing potential

Providing the ability to bridge data architectures

- DRM provides a "Rosetta Stone" to facilitate communications between enterprise and data architects about data and data architecture in their efforts to support the business/mission needs of the COIs that they support

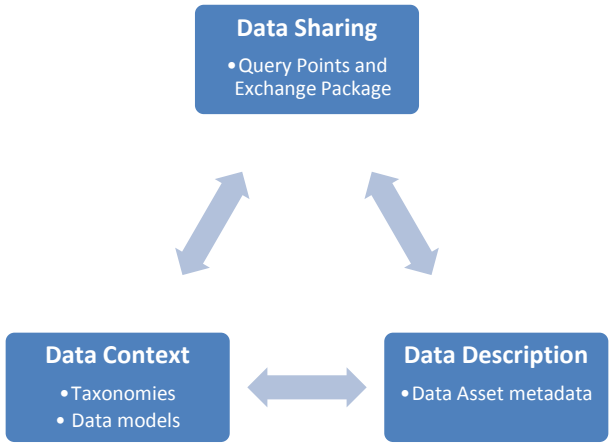
Facilitating compliance with requirements

- DRM Standardization Areas provide a foundation for agency data architecture initiatives to put forth requirements that can result in increased interoperability between agency data architectures

As a reference model, the DRM is presented as an abstract framework from which concrete implementations may be derived. The DRM's abstract nature enables agencies to use multiple implementation approaches, methodologies and technologies while remaining consistent with the foundational principles of the DRM.

DRM STANDARDIZATION AREAS

The DRM provides a standard means by which data may be described, categorized, and shared. These are reflected within each of the DRM's three standardization areas – Data Description, Data Context and Data Sharing.

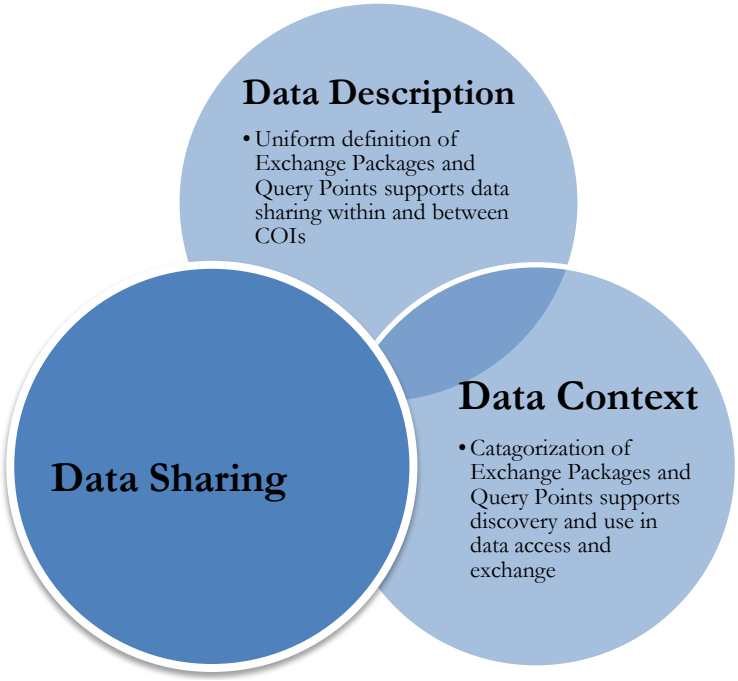


Data Description
The Data Description standardization area provides a means to uniformly capture the semantic and syntactic structure of data. This enables comparison of metadata ("data about data") for purposes of harmonization, and supports the ability to respond to questions regarding what is available in terms of Data Descriptions (metadata).

Data Context
The Data Context standardization area establishes an approach to the categorization of data assets using taxonomies, data models and other descriptive information. In general, Data Context answers key questions about the data required within a COI and establishes the basis for data governance. Data Context also enables discovery of data, and can provides linkages to the other FEA reference models, which are themselves taxonomies.

Data Sharing
The Data Sharing standardization area describes the access and exchange of data, where access consists of recurring requests (such as a query of a Data Asset), and exchange consists of fixed, recurring information exchanges between parties. Data sharing is enabled by capabilities provided by both the Data Context and Data Description standardization areas.

The Data Sharing standardization area is supported by the Data Description and Data Context standardization areas.



C. NIEM ALIGNMENT TO THE DATA REFERENCE MODEL

As noted above, the DRM is an abstract framework providing flexibility in allowing agencies to define multiple implementation approaches, methodologies and technologies while remaining consistent with the foundational principles of the DRM. Historically, NIEM has been used by Federal agencies such as

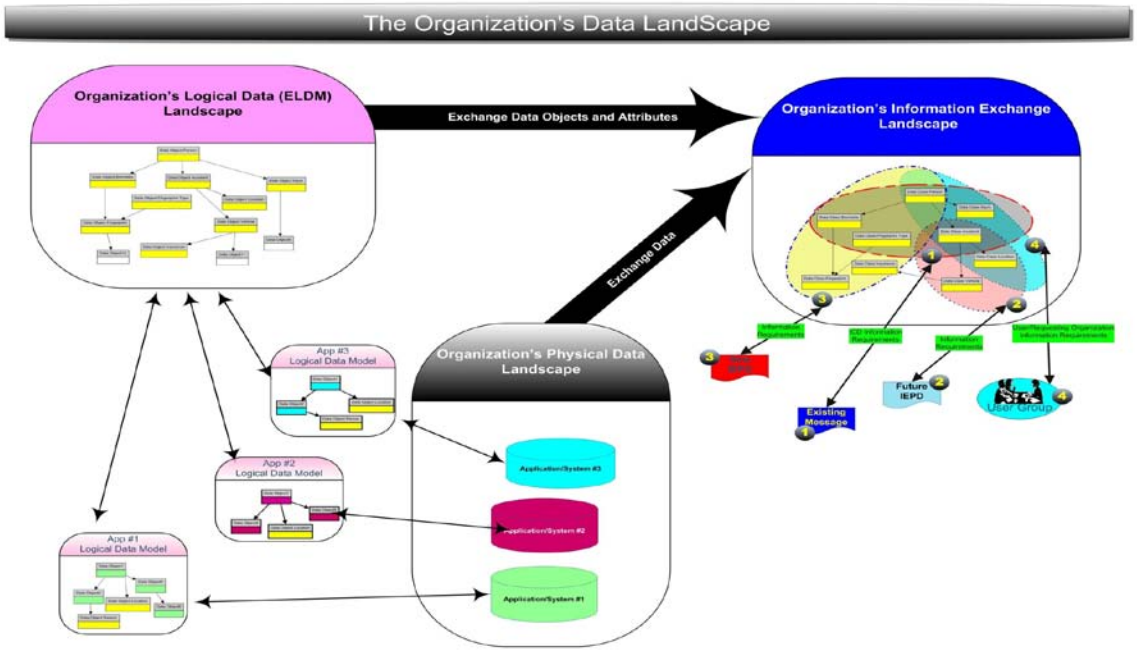
the Department of Justice and the Department of Homeland Security (DHS) to operationalize the data sharing component of the DRM.

Effective information exchange is dependent upon a consistent representation of data achieved through use of metadata terms, definitions and data categories, data artifacts that are understandable and useful, and well defined content definitions that are discoverable and reusable. Successful use of NIEM for information exchange initiatives is dependent upon robust data definitions and the ability to discover data that offers value. These sub-components of the DRM framework enable the development of information exchange initiatives, using NIEM, for the diverse cross-cutting missions led by federal, state, local, tribal and international organizations.

DATA DESCRIPTION STANDARDIZATION AREA

A NIEM Business Information Exchange Component (BIEC) is a NIEM-conforming content model for a data component that meets the needs of an enterprise for exchanging data. An Enterprise Information Exchange Model (EIEM) incorporates several enterprise specific BIECs that meet the business needs for exchanging data using NIEM. An EIEM is an adaptation of NIEM schemas, tailored and constrained for and by an enterprise. The creation of BIECs and EIEMs provide a method for uniformly capturing the semantic and syntactic structure of an agency's data architecture.

An enterprise's Logical Data Model (LDM) is the source for identifying what data types are available for sharing within an organization or mission area. By incorporating data entities from the LDM into an EIEM, exchange package modelers can assure stakeholders that exchange elements are in fact available and being derived from common source. As new information exchange requirements develop, the LDM must be updated to support the new requirements and to align to changes within the EIEM. The alignment of the LDM to an EIEM enhances the information exchange landscape by providing a complete picture of an agency's data environment.



The combination of an agency's LDM and NIEM conformant EIEM ensures that the information exchange data landscape is complete. The goal in aligning the LDM to NIEM is to provide the ability to identify exchange or data elements in an understandable business oriented language. Within DHS, a Component organization has realized the value of LDM-EIEM alignment by automating the process of creating information exchanges by defining table and column elements using the NIEM model and alignment of their EIEM to their LDM. This process allows the Component to automatically generate an exchange schema for each information exchange message, achievable through consistent data descriptions.

DATA CONTEXT STANDARDIZATION AREA

The ability to search, discover, and reuse data architecture assets is the goal of the DRM Data Context standardization area. Understanding data context provides the means for informed government decision making with regard to information holdings.

Many agencies support enterprise architecture (EA) with a centralized metadata repository to manage EA artifacts. These repositories support implementation of the Data Context standardization area of the DRM. This centralized repository provides search and discovery capabilities for potential reuse of enterprise architecture assets across that agency and within its component bureaus.

In addition, these platforms support alignment to the other FEA Reference Models. Metadata for each data asset and information exchange can be contained within the repository. This capability provides the business and technology users the information they require to determine reuse candidates. Other key searchable metadata often includes:

1. Authoritative or trusted sources for data assets;
2. Characteristics and categories of data accessible via an enterprise application system;
3. Data asset information protection and user authorization;
4. Contact information for data asset stewards;
5. Associated systems that use this data asset; and
6. Associated information sharing access agreements that determine who can share and how they can share data from this data asset.

DATA SHARING STANDARDIZATION AREA

NIEM is an implementation of the DRM data sharing standardization area. More specifically, it provides a mechanism for information exchange. NIEM enables data sharing by providing consistency in standards for sharing and governance. As noted previously, data sharing is supported by data descriptions and data context. Without the ability to understand the underlying data or to discover and use that data, the creation of NIEM exchange packages would not be possible.

Data sharing is achieved in NIEM through the creation of Information Exchange Package Documentation (IEPDs). IEPDs map directly to the DRM's concept of an exchange package. While the NIEM model itself provides the consistency in standards for sharing, it is the IEPD that provides the actual exchange package.

An IEPD is a collection of artifacts in a prescribed format that describe the construction and content of an information exchange. IEPDs are developed in a consistent manner to provide the business, functional and technical details of the information exchange through predefined artifacts. The IEPD artifacts are designed to be shared and reused in the development of new information exchanges through publication in IEPD and EA repositories.

APPENDIX C: HIGHLIGHTS OF INTEROPERABILITY - NIEM AND XBRL

A natural affinity exists between the National Information Exchange Model (NIEM) and the eXtensible Business Reporting Language (XBRL) due to their underlying technology and their mission-based applicability. Coordinated use of NIEM and XBRL may allow an organization to leverage respective efforts and progress to lower cost and other barriers at origination and increase semantic value at exchange and delivery.

A. WHAT IS XBRL?

XBRL is, in essence, a method of expressing the semantics of data. The semantics are expressed in the form of metadata within the XBRL taxonomy. An organization's business rules are the equivalent to data semantics and assist in managing data integrity by establishing relationships between one piece of information to another piece of information. Data integrity is critical to authoritative and reliable business information exchange. XBRL provides a global standard for expressing business rules without relying on the application layer. Because of this, every stakeholder interacting in the information value chain can use and have a consistent understanding of the data's meaning. XBRL provides the following two mechanisms in providing semantic meaning:

- *XBRL Taxonomy:* A dictionary used to tag XBRL instance documents. Taxonomies establish the concepts, relations, and resources used by the XBRL instance document.
- *XBRL Instance Document:* Contain the facts (or information) reported by an organization in the form of a business report. Facts are always associated with concepts from an XBRL taxonomy.

XBRL has made significant strides on financial reporting standardization. As a result, organizations have increased financial transparency and aggregation capabilities through implementation of the XBRL US Generally Accepted Accounting Principles (GAAP) taxonomy. Additionally, federal regulators request financial data from public companies and banks using their respective XBRL taxonomies.

B. NIEM AND XBRL COMMONALITIES

Through the nature of their mission spaces, NIEM and XBRL have an overall goal of providing consistency, standardization and improved efficiencies in information exchange. Additional commonalities include:

NIEM	XBRL
• Promotes standardization of information exchange; is composed of: o Common Vocabulary: Provides agreed-upon terms, definitions, and	• Promotes standardized exchange of business and financial information; allows the creation of: o Taxonomy: Provides standard terms,

formats loosely coupled from database storage mechanisms o Structured Approach: Method of developing reference documentation that specifies the NIEM information exchange requirements in an implementation ready package known as an Information Exchange Package Documentation (IEPD) • NIEM has several mission based domains and concepts within each domain are defined and agreed upon by the respective Community of Interest (COI) • Concepts that are universally understood and cross domain boundaries are built into the NIEM Core	definitions, and concepts loosely coupled from database storage mechanisms o Consistency: Repeatable method for tagging business and financial data for information exchange in an XBRL instance document • XBRL facilitates information exchange and comparison through use of established taxonomies • Taxonomy elements are defined by the respective Community of Interest (COI) • Allows a consistent method of communication and interpretation based on a shared understanding on the meaning of the data

Table 4: NIEM and XBRL Commonalities

C. FUTURE COLLABORATION

The NIEM Program Management Office (PMO) and XBRL US have been in discussions to assess the benefits of partnering to provide more robust capabilities in information exchange with an emphasis on financial reporting. This assessment includes the development of feasible business cases for the communities of interest already served by the NIEM domains. Current understanding of the two models reveals that XBRL is document-as-data framework, whereas NIEM is a data-in-motion framework.

The results compiled from agency responses to the Office of Management and Budget's (OMB) evaluation request have demonstrated the need for the definition of financial elements within NIEM. Potential includes the definition of standardized transactional information exchange, per the associated business scenario, for financial data layered with a more semantically detailed XBRL taxonomy for general reporting capabilities

APPENDIX D: HIGHLIGHTS OF INTEROPERABILITY - NIEM AND UCORE

A. WHAT IS UCORE?

The Universal Core (UCore) was created based on recommendations made by a task force investigating information sharing obstacles between the defense and intelligence communities of interest. An inter-agency effort involving the Department of Defense (DoD) and the Office of the Director of National Intelligence (ODNI) was executed to implement the recommendations by finding a common core of universal terms for its communities' information exchange that everyone could agree on. The common core was required to be extensible, scalable, and implementable.

Through analysis of DoD and ODNI data, the agencies discovered that the core set of messaging data included the concepts of who, what, when, and where. UCore version 1.0 was published following an effort to define the "when" and the "where" through community-wide participation. The initial release included geospatial elements representing the where concept and an absolute time and time period for the when concept. UCore also added a consistent standard for security markings.

B. NIEM INVOLVEMENT

The development of UCore version 2.0 dealt with defining the "what" and "who" concepts. UCore was expanded to include the NIEM centric domains of law enforcement and counter-terrorism. UCore is largely agnostic with respect to the information exchange vocabularies of the various communities. Because of this, version 2.0 was developed with the goal of providing the ability to supplement the basic UCore exchange with richer, more detailed information content in the form of NIEM "payloads", when necessary, governed by the creation of NIEM Information Exchange Package Documents (IEPDs). The ability to capture the who, what, when, and where concepts was fully realized in version 2.0. More importantly, the effort also provided a collaborative environment for joint NIEM and UCore development.

C. A CONTINUED COLLABORATION

DoD and ODNI have maintained a focus on building and implementing UCore as a way of loosely coupling systems that need to exchange information. While UCore and NIEM are separate initiatives, their design goals do not conflict. They are complimentary efforts that address different areas of the information exchange challenge, as evidenced by the involvement of the NIEM program in the requirements, design, and implementation of UCore 2.0.

UCore addresses broad exchange goals through a minimal set of widely-applicable concepts (noted above as who, what, when, and where), and NIEM provides a rich semantic model and addresses the need for improved reuse, high quality exchange designs. More importantly, NIEM provides a structured definition of the data-in-motion at the payload level of a UCore message. NIEM will continue to add value by providing the tools and processes necessary to define detailed payloads for information exchange in the UCore model.

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APPENDIX E:
AGENCY RESULTS DETAILS

This report highlights prospective cross-domain information exchange opportunities that agencies have identified. For each agency that provided a full assessment based on the templates, a summary of findings chart that includes the following is provided:

Executive Summary: brief description of the particular information exchange(s) submitted.	**Stakeholders:** participants within the identified information exchange value chain.
Cross-domain opportunities: a list of other potential cross-domain opportunities that exist within an agency or enterprise may include recommendations for potential information sharing with communities of interest outside of agency submission.	**Readiness:** • *if agency is committed to use*: outlines agency needs prior to 'on-ramping' with NIEM • *if agency is further evaluating*: outlines the barriers preventing immediate adoption • *if agency will not use*: description of what will be and/or is used.
Potential success stories: includes potential opportunities for information sharing with additional communities of interest, may include successes outside of agency submission indented in cross-domain opportunities section.	**Milestones:** includes other pertinent information and steps regarding cross-domain information exchange as well as steps to more strategically or tactically investment in NIEM. • *if agency is committed to use: outlines agency needs prior to 'on-ramping' with NIEM* • *if agency is further evaluating: outlines the barriers preventing immediate adoption* • *if agency will not use: description of what will and/or is used*

Table 5: Layout for Agency Summaries

This report is inclusive of all submissions received as of June 11, 2010.

A. DEPARTMENT OF AGRICULTURE (USDA)

Information Exchange: Risk Management Agency (RMA), Farm Services Agency (FSA), National Agriculture Statistics Service (NASS), Natural Resources Conservation Service (NRCS), and private sector agriculture service providers.

Executive Summary

- USDA has initiated a project called the Acreage Crop Reporting Streamlining Initiative (ACRSI). The project focuses on establishing a common USDA framework for Producer commodity reporting in support of USDA programs that will enable the producer to report common data once and RMA, FSA, NRCS and NASS to share the data to eliminate duplicate reporting by producers. The approved data standards will be published on NIEM and the USDA website to support their adoption in private sector agriculture service providers systems and technologies to assist producers in meeting USDA program participation requirements
- The purpose of this information exchange is to allow for consistent reporting of common commodity data for use by Risk Management Agency (RMA), Farm Services Agency (FSA), National Agriculture Statistics Service (NASS), Natural Resources Conservation Service (NRCS), other and private sector agriculture service providers USDA agencies
    - Common commodity data is used to determine insurance and farm program eligibility and benefits. Inconsistent definitions result in confusion by producers and duplication of effort by the agencies.
    - Commodity reports for FSA, NASS, NRCS and RMA are uploaded into the Comprehensive Information Management System (CIMS), so there is a central repository of information
    - FSA ,RMA, NASS and NRCS do not share a common system for producer personally identifiable information (PII), so there is not a standard with the different commodity reports

CIMS currently requires a translation between crop names and codes between the four

Stakeholders

- Federal Agencies
- FSA
- Insurance Providers
    - Insurance Agent
    - Loss Adjuster
- RMA
- NASS
- NRCS
- Office of the Chief Information Officer (OCIO)
- Other USDA Offices and Agencies
- Producers
- Private Sector Agriculture Service Providers

agencies	
Cross Domain Opportunities • Agriculture Community Of Interest (COI) • Disaster Assistance COI • Financial Management COI • Insurance COI • Social Security Administration	**Readiness** • The agency does not use an alternate information exchange and does not use non-conformant National Information Exchange Model (NIEM) • The agency is currently evaluating NIEM methodology, and looking to make a decision in the near future about NIEM adoption
Potential Success Stories • USDA support for the data exchange is rolled into initial operating capability (IOC) for modernization projects, using business resources identified for those projects and a system integrator • Significantly reduce the translations required between the FSA, RMA, NASS, and NRCS reports and the differences in producer data • **Provide participating producers the option to report and maintain their data via a consolidated USDA Web Reporting portal that will provide the data to agencies whose programs in which the producer is participating** • The implementation of the exchange via NIEM will foster a common understanding and definition of the elements collected by the commodity reports of the four agencies would pave the way to be able to collect this data through a common interface in the future, which would help to eliminate the possibility of producers providing different information to each agency in order to optimize benefits • The standardization of the data elements can be reused by many other	**Milestones/Commitment to Use NIEM** • USDA proposes continuation of its evaluation of the NIEM methodology • A decision for adoption will be considered as they progress further with the evaluation • Current deliberations led USDA to believe that NIEM could provide favorable returns to the Department

agencies in the USDA when dealing with a producer; the common data elements in the FSA, RMA, NASS and NRCS commodity reports can be reused • Benefits to private parties that producers might interact with such as feed or pesticide companies • Once the data elements are standardized, mapping to NIEM elements can occur and NIEM can be used to publish artifacts for use in electronic access for commodity crops reporting	

B. DEPARTMENT OF DEFENSE (DOD)

Information Exchange: Counter Improvised Explosive Device

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Executive Summary

- A recent working group was formed, facilitated by the DoD Chief Information Officer (CIO), to assess "Improved [Improvised Explosive Device] Defeat Information Sharing"
    - One key recommendation was to implement the DoD Net-Centric Data Strategy and the need for common mission-specific data standards for exchange and sharing of information supporting IED reporting, exploitation and defeat
        - This recommendation will allow systems containing IED reports to make their data searchable and accessible via a common information exchange model to any authorized consumer
    - The objective is to implement the DoD Net-Centric Data Strategy and expose live IED reporting (from strategic to the tactical level) so that the warfighter and intelligence analysts can dynamically discover the real-time IED reporting data via Net-Centric Enterprise Services (NCES) Content Discovery and Enterprise Search

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Stakeholders

- Allied Nations
- DoD
- Department of Homeland Security (DHS), Office of Infrastructure Protection
- Department of Justice (DOJ)
- Intelligence Analysts
- Joint Improvised Explosive Device Defeat Organization (JIEDDO)
- Warfighter

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Cross Domain Opportunities

- Counter-IED Community of Interest (COI)
- DoD COI
- Infrastructure Protection COI
- Intelligence COI
- Justice/Law Enforcement COI

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Readiness

- No indication that the referenced exchange will make use of the National Information Exchange Model (NIEM) as the DoD Discovery Metadata Specification (DDMS), UCore, and the Weapons Technical Intelligence (WTI) IED Lexicon were identified as the conformant standards for the proposed information exchange
- There are several examples of NIEM use within the DoD; one key capability was

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	developed by the Naval Criminal Investigative Service (NCIS) and is known as the DoD Law Enforcement Data Exchange (DDEX) • A recent focus of the DoD and the Intelligence Community (IC) has been building and implementing UCore as a way of loosely coupling systems that need to exchange information • UCore and NIEM are complementary efforts that address different areas of the information sharing challenge; NIEM typically provides a richer vocabulary found in the payload of an UCore exchange
Potential Success Stories /Current Use Within DoD • Alignment to a Presidential Memorandum dated January 7, 2010 which directed the "acceleration of information technology enhancements, to include knowledge discovery, database integration, cross-database searches, and the ability to correlate biographic information with terrorism-related intelligence" • The NCIS, through the use of NIEM, developed the DoD Law Enforcement Data Exchange (DDEX) which is a web-based capability for DoD investigative and law enforcement agencies. DDEX integrates DoD investigative and law enforcement agency data to provide seamless access to this data for military law enforcement personnel as policy and user roles are defined. • DDEX initially employed the Global Justice XML Data Mode (GJXDM). As standards evolved, DDEX has been updated so that the systems have the ability to ingest as well as export data into the NIEM standard format. • DDEX also has the ability to query and retrieve data from peer systems (FBI Law Enforcement National Data Exchange - N-DEx, and Immigrations and Customs Enforcement Pattern Analysis and	**Milestones/Commitment to Use NIEM** • The DoD and IC will adopt a position with respect to UCore and NIEM that considers the following elements when deciding to use elements of one approach, a combination of both, or neither to develop data standards and information exchanges; specifically, DoD will: o Work with the Federal information sharing community to identify how agency-specific capabilities will be incorporated into Federal consensus data standards o Re-affirm that communities should use the best fit of data standards for their given data sharing problem, rather than assume a position that will use any single standard o Focus all future work on needed capabilities that enable agility, rather than work focused on building the most complete or accurate lexicon o Implement NIEM exchanges where it makes sense, such as when DoD entities need to communicate with the DOJ, DHS, and other agencies where domain work has already been done

Information Collection System - ICEPIC) based on web service standards that are also defined under the NIEM specification	o Work with Federal community representatives (Office of Management and Budget, DOJ, or the DHS as appropriate) to identify high-value information sharing problems in common, and charter COIs to work those problems and to make a data standard selection appropriate to that task

C. DEPARTMENT OF DEFENSE (DOD), OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE (ODNI)

Information Exchange: Sensor Web Enablement of Chemical, Biological, Radiological and Nuclear (CBRN)

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<td>Executive Summary

• There is currently no automated data flow process to relay Defense, State, or Local-level Chemical Biological Radiological Nuclear (CBRN) reports into Defense/National Intelligence reporting channels. The current situation requires manual transmission for report distribution

• A CBRN Reporting Bridge is required to effectively deliver Homeland Defense/DoD CBRN Hazard and Situational Awareness Reporting to Defense/National Intelligence consumers

o The CBRN Reporting Bridge will provide an automated data flow process across departmental, agency, and bureau boundaries which will enable multi-directional information sharing for CBRN event reporting

o The CBRN Reporting Bridge's CBRN Plume Web Service (chemical and biological plume data) pilot web service will accept as input either a National Information Exchange Model (NIEM) - formatted message or a North Atlantic Treaty Organization (NATO) Allied Tactical Publication (ATP)-45 message</td>
<td>Stakeholders

• Defense Intelligence Agency's National MASINT Management Office (NMMO)

• Defense Threat Reduction Agency (DTRA)

• Department of Homeland Security (DHS), Domestic Nuclear Detection Office (DNDO)

• Distributed Common Ground System-Army (DCGS-A)

• Joint Interoperability Test Command (JITC)

• Joint Program Executive Office for Chemical, Biological Defense (JPEO-CBD)

• Joint Program Manager Information Systems (JPM IS)

• United States Joint Forces Command (USJFCOM)/J87</td>
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<td>Cross Domain Opportunities

• CBRN Community of Interest (COI)

• DoD COI

• Intelligence COI</td>
<td>Readiness

• See Readiness under the DoD Counter Improvised Explosive Device (C-IED) Information Exchange</td>
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• Justice/Law Enforcement COI	
Potential Success Stories /Current Use Within DoD • The CBRN Reporting Bridge will increase intelligence and situational awareness support for CBRN and Weapons of Mass Destruction (WMD) information/intelligence consumers • Possible collaboration between DNDO, the Nuclear Regulatory Commission (NRC), and the Department of Energy to enrich the NIEM CBRN domain	**Milestones/Commitment to Use NIEM** • See Milestones/Commitment to Use NIEM under the DoD Counter Improvised Explosive Device (C-IED) Information Exchange

D. DEPARTMENT OF EDUCATION (ED), FEDERAL STUDENT AID

Information Exchange: Federal Student Aid Data Dissemination to Social Security Administration

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Executive Summary

- Federal Student Aid (FSA) sends name and number data to Social Security Administration (SSA) for validation
    - This is of high-value to FSA, since it provides critical information for processing student aid applications and their related award(s)
    - The SSA information exchange is high-volume, occurring in batch files sent daily to SSA
    - This exchange helps verify that a Social Security Number (SSN) provided by a citizen or other stakeholder is accurate and that the provided Personally Identifiable Information (PII) matches the records of SSA
- This particular exchange is unique to Federal Student Aid, so only Federal Student Aid is directly dependent on this exchange

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Stakeholders

- Authorized Partners/Servicers
- Borrowers
- Lenders
- Schools (includes all institutions)
- SSA
- Students

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Cross Domain Opportunities

- Education Community of Interest (COI)
- Financial Management COI
- Grants Management COI

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Readiness

- Reuse is promoted and strongly encouraged across the education community and within FSA
- FSA currently uses a data exchange standard that was developed jointly with the education community, in association with the PESC
- This standard defines the properties of business metadata including a description of the metadata and maintains any schemas approved by PESC's Change Control Board (CCB)
- A governance process is in place to ensure proper communication, collaboration and maintenance of the XML Registry and

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	Repository (R&R); all additions and modifications are reviewed and approved by the CCB • There is no publicly available training program; FSA's Enterprise Data Management (EDM) staff is available for internal end-user training and guidance • There is no helpdesk; users with questions or seeking assistance send requests by email to XMLRegistrySupport@ed.gov
Potential Success Stories • FSA already has an information exchange model composed of the conceptual data model, logical data model and XML R&R, as well as a data governance process in place • There are no immediate targets for new FSA information exchange and the agency's high value and mission-critical information exchanges with external parties are already defined and currently automated • The information exchange is potentially reusable by other agencies with the same needs; SSA is the organization to promote reuse, and thus the benefits, of leveraging this or similar exchanges used across all its information consumers	**Milestones/Commitment to Use NIEM** • FSA has assessed the feasibility and applicability of adopting the NIEM as requested by the Office of Management and Budget (OMB) and has determined not to adopt NIEM at this time • The basis for the NIEM Information Exchange Readiness is summarized below: o FSA has mature data management processes and procedures that promote standards and apply best practices to the creation, maintenance and sharing of business data o FSA has an Enterprise Conceptual Data Model and Enterprise Logical Data Model that has been vetted with the business and CIO stakeholders o FSA manages an XML R & R that is used by the Post-Secondary Education Community (PESC) and other post-secondary stakeholders o FSA has a sound data governance program which includes a governing body or council, a defined set of procedures, and a plan to execute those procedures

E. DEPARTMENT OF ENERGY (DOE)

Information Exchange: eAdjudication and Homeland Security Presidential Directive 12 (HSPD-12) XML Exchanges

Executive Summary **Information Exchange 1: eAdjudication** • DOE evaluates the feasibility of using National Information Exchange Model (NIEM) to exchange information with the Department of Army (Army) as part of the security clearance process • Security clearance determinations granting access to classified information and facilities considers factors that may make the person a risk to national security and is handled in the adjudication phase by the Army • Current process consists of passing a zip file from DOE to Army • To-be process envisions converting the zip file exchange to be replaced by NIEM-conforming Information Exchange Package Document (IEPD) **Information Exchange 2: Homeland Security Presidential Directive 12 (HSPD-12)** • The General Services Administration (GSA) Managed Services Office (MSO) creates and issues Homeland Security Presidential Directive 12 (HSPD-12) credentials for over 100,000 DOE employees and contractors • GSA MSAO generates, captures, and stores a significant amount of data that would be useful to Department of Energy (DOE) organizations in their physical and logical access implementations • GSA's business model requires Federal agencies to establish a centralized repository that interfaces with the GSA MSO system	**Stakeholders** • Army • DOE's Office of Health, Safety and Security (HS) • Office of Personnel Management (OPM)

• As part of the DOE Identity, Credential, and Access Management (ICAM) program, DOE will adopt NIEM in to interface with GSA to establish a central repository of the DOE HSPD-12 credentialing data • The HSPD-12 Credential needs to be associated with the DOE employee's user account in Active Directory so the employee can use it to logon to the network	
Cross Domain Opportunities • Chemical, Biological, Radiological, Nuclear (CBRN) Community of Interest (COI) • Federal COI • Intelligence COI • Justice/Law Enforcement COI • Management COI	**Readiness** • DOE has implemented a strategy that a software development life cycle should use those that are best fit and cost-effective. This provides an opportunity for the Department to be an early adopter of NIEM where appropriate. • The DOE has an assertive outreach and training program, and a wide variety of tools and processes in place to infuse NIEM value with a variety of stakeholders o Present briefings to executive stakeholders to discuss the long-term benefits of using NIEM, when appropriate, to meet mission objectives. o Conduct local briefings on site and remote stakeholders can be invited to participate in on-line conferences, e.g., WebEX o Provide cost effective technical training options using the NIEM on-line technical training course.
Potential Success Stories • DOE analysis of using NIEM conforming XML for exchanging adjudication information to the Army provides management with a strong basis to move forward to the next phase of detailed analysis to gain Army commitment of time	**Milestones/Commitment to Use NIEM** • 2010 – 2011 DOE plans to build awareness • 2011 - 2013 DOE plans early adoption pilot projects • 2012 – 2015 DOE plans NIEM Investment

and resources to further pursue the feasibility to implement NIEM • Potential usage of CBRN domain elements for cross-boundary information sharing with the Department of Homeland Security, Domestic Nuclear Detection Office	Planning and Implementation • 2015 DOE plans institutionalization of NIEM

F. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS)

Information Exchange: Patient Health Summary and Information Technology (IT) Investment Reporting

Executive Summary **Information Exchange 1: Patient Health Summary** • An objective established in the Use Objectives and Measures: 2011-2013-2015 is to "Produce and share an electronic summary care record for every transition in care (place of service, consults, discharge)"; the corresponding performance measure is "Percent of transitions where summary care record is shared" • A Summary Care Record (also known as a Patient Health Summary) is defined as a concise, standardized clinical record that makes a patient health data set (including but not limited to medications, allergies, medical problems, test results, and medical procedures performed) available for consultations with specialists and/or for emergency medical treatment **Information Exchange 2: IT Investment Reporting** • This effort was started to provide standardized information exchange packages for monthly and annual agency submissions of investment data to the Federal IT Dashboard • Provide a foundation for establishing a common vocabulary and data structure that will help promote seamless exchange of information related to government-wide financial management, planning, and accountability program areas in a new domain within National Information Exchange Model (NIEM)	**Stakeholders** • Federal Agencies • Health Community • Office of Management and Budget (OMB) • United States Citizens

Cross Domain Opportunities	Readiness
• Emergency Management Community of Interest (COI) • Federal Capital Planning and Investment Control (CPIC) COI • Health COI • Management COI	• The adoption of the NIEM at HHS would involve deployment of capabilities to support specific NIEM-related activities • HHS has long recognized the value offered by NIEM and has made the NIEM adoption and use one of the cornerstones of its data architecture initiatives • The Department's Enterprise Architecture Program Management Office (EA PMO) is spearheading the efforts to implement enterprise-wide capabilities that would allow integrating discovery, reuse, and development of NIEM-conformant information exchange specifications into the general enterprise architecture development process • HHS has established activity groups for the following NIEM related activities: o Discovery/reuse and development of NIEM conformant information exchange specifications (IEPDs) o Development of NIEM-conformant Information Exchange Package Documents (IEPDs) as part of multiagency information sharing initiatives o Establishment and stewardship of new domains within NIEM o Establishment and operation of the HHS NIEM Center of Excellence/Support Center, which will offer: ▪ NIEM-focused Information Sharing Knowledge Base tailored to specifics of HHS and its operating environment ▪ Guidance on the discovery/reuse and development of NIEM IEPDs ▪ NIEM-focused training tailored to the HHS Enterprise Architecture for executives, project managers, enterprise architects, system developers, and business analysts

	throughout HHS ▪ Assistance with regard to coordinating with information exchange partners ▪ Helpdesk support
Potential Success Stories • HHS EA PMO, in collaboration with the Office of the National Coordinator (ONC) for Health IT, initiated a pilot effort aimed at producing a NIEM-conformant specification for exchanging patient health summary information. This effort will lead to the creation of a health information exchange model based on the NIEM model and associated processes. • Creation of standardized information exchange package documents (IEPDs) for the submittal of OMB Exhibit 53, Exhibit 300, and TechStat related data. The standardized information exchanges would be used across all agencies within the Executive Branch for reporting to OMB's IT Dashboard. Elements created will form the new Planning and Accountability domain within NIEM. • The HHS team is expected to play the lead role in architecting the underlying information exchanges which are expected to be made NIEM-conformant as most of those exchanges cross boundaries of individual organizations in the National Health and Human Services Business Architecture (NHHSBA). It is further envisioned that the data objects and attributes contained in those exchanges will form new Human Services domain within the NIEM.	**Milestones/Commitment to Use NIEM** • The HHS EA PMO is spearheading the efforts to implement enterprise-wide capabilities that would allow integrating discovery, reuse, and development of NIEM-conformant information exchange specifications into the general enterprise architecture development process • The long-term strategy for adopting the NIEM at the HHS entails standing up a NIEM Center of Excellence/Support Center that would be responsible for providing guidance, resources, and technical assistance to the operating divisions using NIEM in their respective core-mission areas • The adoption of the NIEM at the HHS would involve deployment of capabilities to support the following key activities: 1. Development, discovery, and reuse of NIEM-conformant information exchange packages 2. Development of NIEM-conformant specifications as part of multiagency information sharing initiatives 3. Establishment and stewardship of new domains within the NIEM 4. Establishment and operation of the HHS NIEM Center of Excellence/Support Center

G. DEPARTMENT OF HOMELAND SECURITY (DHS), FEDERAL EMERGENCY MANAGEMENT AGENCY

Information Exchange: Logistics Supply Chain Management System and Disaster Assistance Improvement Program

Executive Summary	**Stakeholders**

Information Exchange 1: Logistics Supply Chain Management System (LSCMS)
• Supports the Federal Emergency Management Agency's (FEMA) logistics' mission with operational and support capabilities for managing the entire disaster supply chain including FEMA-owned assets and resources as well as those provided by partners in other federal agencies, non-governmental organizations, federal/state/local/tribal governments, and the private sector including both operational support and providing disaster supply chain visibility to all stakeholders, from managers of distribution points to all levels of the federal/state/local/ tribal governments
• LSCMS provides situational awareness and in-transit visibility through reporting and GIS mapping capabilities; through these actions LSCMS/TAV supports the Logistics Management Directorate's (LMD) mission as the National Logistics' Coordinator
• LSCMS has an operational requirement to exchange supply request and response information with the vendor community including the exchange of information with other public sector partners to provide advance information on FEMA logistics orientation.
• The future LSCMS will look to provide logistics, shipping and resource information to Federal, State, and Local partners using the Emergency Data eXchange Language (EDXL), specifically the Resource Messaging (EDXL-RM) protocol
Information Exchange 2: Disaster Assistance Improvement Program
	• Federal, State, Local, and Tribal Entities
	• FEMA Headquarters
	  o Distribution Centers
	  o Forward Temporary Housing Unit (THU) Sites
	  o Incident Support Bases
	  o Regional Response Coordination Centers
	• Non-governmental Organizations
	• Partners/Vendors
	• SBA ODA
	• United States Citizens

• The Disaster Assistance Improvement Program (DAIP) resulted from citizen confusion and frustration with conflicting and misdirected information received as they sought disaster assistance from multiple Federal programs in the aftermath of Hurricane Katrina • Goal of DAIP is to ease the burden of disaster victims by consolidating federally funded forms of assistance information, application intake and status information into a unified system • DisasterAssistance.gov provides disaster survivors with a single source for potential assistance programs, easy access to the application process, application updates, and disaster related information and provides scalability for a secure open framework that enables integration with state programs that use federal funds and private/non-profit organizations • DAIP also leverages existing fraud mechanisms and indicators to reduce waste and abuse • A Small Business Administration (SBA), Office of Disaster Assistance's (ODA) Strategic Management Goal is to offer disaster victims accessible, easy-to-use and time-saving services; by leveraging the power of technology and the Internet and the results obtained through DAIP, ODA can develop a virtual loan process that provides efficient and timely loan decisions to disaster victims • The purpose of this information exchange is to enable disaster victims who have successfully completed a FEMA application to be referred automatically through the unified system to SBA for disaster loan assistance	

Cross Domain Opportunities	Readiness
• Emergency Management Community of Interest (COI) • Financial Management COI • Management COI • Social Security Administration	• FEMA has been a leading participant in the adoption and use of NIEM, and in developing reference information exchange package descriptions to support reusable cross-boundary information exchanges • Effective information sharing is critical to the success of a coordinated emergency response; to facilitate and enhance emergency response data communications, the Department of Homeland Security (DHS) Office for Interoperability and Compatibility (OIC) Directorate of Science and Technology (S&T) and the Federal Emergency Management Agency (FEMA) entered into an agreement to co-own the Emergency Management (EM) domain within the NIEM data model • FEMA has been a leader and co-custodian for NIEM's Emergency Management domain to promote and develop standards for emergency management information exchanges • These standards for information exchanges encompass both messaging standards such as the external EDXL standard and the data model NIEM; the efforts have consisted of close collaboration and cooperation among Office of Management and Budget (OMB), DHS, FEMA and OASIS as well as many other state, local, tribal and municipal organizations and practitioner
Potential Success Stories	**Milestones/Commitment to Use NIEM**
• FEMA has established a consolidated data modeling effort across the enterprise though comprehensive Data Modeling Guidance that includes Conceptual Data Model (CDM) and an over-arching data modeling design as guidelines for a Logical Data Model (LDM) for the enterprise; this approach has been taken to establish a solid foundation to facilitate and promote information exchange within the Agency and among Federal, State, Local, Tribal and private industry partners through integration with NIEM and realizes the following	• FEMA fully endorses and supports the OMB FY11 Guidance request and believes that all federal agencies should be integrating NIEM into their enterprise architecture and organization standards • FEMA has and will continue to develop and adopt Information Exchange Package Documents (IEPDs) to define and refine the information sharing capabilities across the enterprise of the emergency management domain

important benefits: o Meets DHS and FEMA Strategic Goals for information sharing by employing a policy based data modeling program o Implements, promotes, and uses NIEM o Satisfies DHS Enterprise Data Management Office (EDMO) policy on data modeling o Prepares for integration into the FEMA Information Services Architecture (FISA), a forthcoming Service Oriented Architecture (SOA) program o Facilitates information sharing needs for project deployments with internal and more importantly external partners (Federal, State, Local, Tribal, and Commercial)	• New programs are being added to the work already in progress to expand and build-out the information exchange capabilities across the Agency and with its partners.

H. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

Information Exchange: Credit Alert Interactive Voice Response System

Executive Summary • Alert Interactive Voice Response System (CAIVRS) contains data exchanges with many agencies, and is used by HUD-approved lenders, several participating Federal lending agencies, and lenders acting on the Government's behalf to prescreen applicants for federally guaranteed loans against a shared inter-agency database of delinquent Federal borrowers • CAIVRS contains many data exchanges; one core high volume information exchange is the web-based prototype for Citizen Access to CAIVRS and the user authentication method to support the prototype	**Stakeholders** • HUD • Department of Agriculture • Department of Justice • Department Veterans Affairs • Department of Education • Financial Institutions
Cross Domain Opportunities • Agriculture Community of Interest (COI) • Education COI • Financial Management COI • Human/Family Services COI • Justice/Law Enforcement COI	**Readiness** • No existing governance structure was identified • Several employees have participated in the Executive Overview training, and the Technical training
Potential Success Stories • CAIVRS is a HUD-initiated Federal government interagency shared database accessed by several participating agencies. Migrating the data exchanges within the CAIVRS system to be National Information Exchange Model (NIEM)-conformant would promote/improve interoperability across participating agencies and financial institutions. The use of standard information exchanges would also aid new business partners when	**Milestones/Commitment to Use NIEM** • No significant milestones were identified • HUD is looking to adopt NIEM as an information exchange model

integrating with the CAIVRS system. • NIEM-conformant exchanges would assist agencies in meeting the Office of Management and Budget (OMB) performance goal that certain program agencies and their authorized financial institutions should use CAIVRS to conduct prescreening to determine a loan applicant's credit status with the Federal Government • Exchanges supporting the HUD-Veterans Affairs Supportive Housing (HUD-VASH) Program, a rental assistance program that connects homeless veterans from local Veterans Affairs Medical Centers (VAMC) with rental assistance vouchers provided by local public housing agencies	

I. DEPARTMENT OF JUSTICE (DOJ)

Information Exchange: Logical Entity eXchange Specification (LEXS) and Law Enforcement National Data Exchange (N-DEx)

Executive Summary	**Stakeholders**
• As an originator of the National Information Exchange Model (NIEM), DOJ plans to continue supporting NIEM and the development of information exchange standards • The development of the Logical Entity eXchange Specification (LEXS) and the Law Enforcement National Data Exchange (N-DEx), and the Suspicious Activity Report (SAR) Information Exchange Package Document (IEPD) are the latest examples of DOJ's support for information sharing • The N-DEx exchange package was developed to provide a single method for multiple Law Enforcement Agencies to access and share information in a common environment. This promotes a standard for information sharing on a national level for law enforcement and criminal justice entities.	• Federal Agencies • DOJ Components • Law Enforcement Agencies o Federal/State/Local/Tribal
Cross Domain Opportunities	**Readiness**

• Chemical, Biological, Radiological, Nuclear (CBRN) Community of Interest (COI)
• Immigration COI
• International Trade (IT) COI
• Justice/Law Enforcement COI
• Maritime COI
	• DOJ supports and conforms to all NIEM activities including;
	  o IEPD Development Life Cycle
	  o NIEM Governance structure
	  o Use of open source NIEM compliant toolsets found on www.niem.gov
	  o Use of NIEM approved training
	  o Use of the NIEM Help Desk/Knowledgebase
	  o Promote reuse through publishing information exchanges in a repository such as the IEPD Clearinghouse

Potential Success Stories	Milestones/Commitment to Use NIEM
• **LEXS**: The creation of LEXS has helped DOJ support the implementation of interoperable NIEM-conformant information exchanges both within the Department and with external stakeholders • **N-DEx**: Although law enforcement will be the primary focus of N-DEx, future iterations will incorporate the full criminal justice community. The ultimate goal is to transform justice data into knowledge for the entire justice community. • **FOIA**: NIEM will be used by all 92 Federal agencies in submitting annual Freedom of Information Act (FOIA) reports to DOJ. The use of NIEM in the development and implementation of a FOIA dashboard to provide public information about FOIA administration across the government. The use of NIEM will allow an interested party to write a program to extract FOIA data elements reliably for analysis. • **SAR**: DOJ has also led the development of the Information Sharing Environment Suspicious Activity Reporting (SAR) Functional Standard and State, Local, Tribal (SLT) SAR Standard	• Unless there is a compelling business reason not to use NIEM, all Components of the Department of Justice (DOJ) should use NIEM for information sharing activities, as follows: • DOJ Components should follow the guidelines for implementing NIEM-conformant information exchange as specified in the DOJ Guidance on Implementation of NIEM and LEXS, which was released in Q1 FY08 • DOJ Components should provide relevant information to the Department's IT Investment Planning process to show implementation of interoperable NIEM-conformant exchanges • DOJ Components should require the use of NIEM in Request For Proposal language with commercial vendors and in grant language with State, Local and/or Tribal governments as appropriate • NIEM will be used by all 92 Federal agencies in submitting annual FOIA reports to DOJ to support the FOIA.gov website and to make data available in a format that is machine readable.

J. DEPARTMENT OF LABOR (DOL)

Information Exchange: Farm Labor Contractor Certification

Executive Summary	**Stakeholders**
• The certification of Farm Labor Contractors (FLC), and certain employees of farm labor contractors (FLCE) engaged in furnishing, recruiting, employment and soliciting, housing or transporting (FRESHT) activities of migrant and seasonal agricultural workers • Enforcing the Migrant and Seasonal Agricultural Worker Protection Act, Wage and Hour Division (WHD) relies on accurate, timely, and quality data resources in order to accomplish its mission • It is critical to share and exchange data throughout the Department of Labor (DOL) and with external organizations	• WHD, Division of Enforcement Policy • Federal Bureau of Investigation (FBI) • Farm Labor Contractor Employee • Farm Labor Contractors • Licensed Physician • Local Police • State/Local Housing Inspection Authority • State/Local Vehicle Inspection Authority • Vehicle Insurance Companies
Cross Domain Opportunities	**Readiness**
• Health Community of Interest (COI) • Justice/Law Enforcement COI • Transportation COI	• While DOL wants to reap the benefits from the discovery and reuse of NIEM Information Exchange Package Documents (IEPD), DOL is also looking to identify and develop cross boundary information exchange opportunities. This process will involve: o Incorporating NIEM requirements into DOL EA, Investment and SDLC practices. o Enabling effective Data governance for cross domain data sharing. o Implementing IEPDs as XML schemas from operational systems and/or an EA repository o Training DOL staff on enabling cross domain data sharing using NIEM o Creating a Memorandum of Understanding (MOU) with other federal, state, local, tribal or private sector entities with whom DOL is interested in sharing information • The DOL Enterprise Architecture (EA) Program

	Management Office (PMO) provides the DOL agencies with the capabilities derived from the Federal Enterprise Architecture (FEA) Data Reference Model (DRM) Version 2.0 to describe their Data Architecture • The basic approach for many of the DOL architecture aspects is federation; each agency has defined its data architecture as part of the larger Agency EA Model, and ultimately federated up into the Enterprise Level EA • The EA PMO is establishing an enterprise Data Architecture and maturing its data governance and stewardship practices; National Information Exchange Model (NIEM) is a potential standard of the DRM • DOL can use NIEM reusable work products that can be easily tailored to meet any business exchange requirements for increased accuracy and timeliness of information sharing • DOL has not implemented any other competing data exchange model standard
Potential Success Stories • WHD can provide a reusable template that can be easily tailored to meet any business exchange requirements for increased accuracy and adherence to timelines pertaining to information sharing • Enhancing NIEM's labor modeling capabilities through the creation of labor-related concepts • Federal, State, and Local Labor agencies can begin with a reusable template that can be easily tailored to its individual needs • The Bank Secrecy Act (BSA) Bulk Data Dissemination system will develop NIEM-compatible data exchange templates to standardize information sharing across many DOL organizations	**Milestones/Commitment to Use NIEM** • DOL's NIEM Information Exchange Readiness is dependent on its EA PMO Roadmap for FY 2010-2011 • DOL has identified 5 subject areas (domains) of prime importance to define the common Logical Data Models (LDM) o Enforcement o Worker Benefits o Accreditations, Licenses and Certification o Grants o Rule Making • EA PMO's strategic intent is to establish an Enterprise Data Management (EDM) and mature its data governance and stewardship practices • DOL is beginning to institutionalize enterprise-

• Information exchange will promote reusability and consistency of information usage while enhancing the quality of DOL decision making • Will potentially provide broader capabilities to the current NIEM Labor domain in dealing with financial crimes both domestically and internationally	wide data governance mechanisms • NIEM facilitates a foundation upon which DOL-wide data enterprise data architecture could be built • DOL could reap cost avoidance savings by leveraging the NIEM reuse model and processes • To validate their understanding of the NIEM processes, DOL plans to run a "proof of concept" project with a candidate situation, with the objective to compare the planned DOL Enterprise-Wide Data Model and NIEM

K. DEPARTMENT OF THE INTERIOR (DOI)

Information Exchange: Recreation Information Database and National Recreation Reservation Service Exchange

Executive Summary	**Stakeholders**
• The challenge to a tourist is researching recreation sites that are provided by distinct bureaus with varying activities and entry requirements • The solution is an information exchange between the Recreation Information Database (RIDB) and the National Recreation Reservation Service (NRRS) with a tourist interface on Recreation.Gov to centralize all research on recreation sites • Increasing the tourist's understanding about the features of a site before a physical visit results in two events: the tourist chooses to visit the site and the tourist is informed of (and may secure) any permits or passes required prior to arriving at the site • The Department of the Interior (DOI) has an established segment architecture process that includes steps to evaluate the data exchanges between systems in the course of completing business transactions, and the Departmental Enterprise Architecture Repository (DEAR) serves as the modeling environment in order to associate the exchanges to the overall architecture in a structured form	• National Park Service • Tourists • Trip Planners
Cross Domain Opportunities	**Readiness**
• Emergency Management Community of Interest (COI) • Interior COI • Justice/Law Enforcement COI	• DOI has decided to adopt the National Information Exchange Model (NIEM) and will develop a detailed adoption plan for the agency • Building a consensus regarding NIEM and the value of conforming to a standard that is Federal-wide may be the greatest challenge

Potential Success Stories	Milestones/Commitment to Use NIEM
• The use/reuse of National Information Exchange Model (NIEM) Information Exchange Package Documents (IEPDs) can facilitate many new information exchanges amongst the diverse bureaus in the DOI	• DOI has decided to adopt NIEM and will develop a detailed adoption plan for the agency • To implement the plan, additional resources may be required to: o Develop outreach and training to increase the understanding of NIEM and its value to DOI, starting with executives and project managers and including the creation a group of subject matter experts (SMEs) across DOI o Meet with process and tool subject matter experts to plan and execute the changes required to incorporate NIEM o Build a tactical plan to adopt NIEM for new information exchanges, prioritizing information exchanges that are part of active segment architecture projects and Bureau-identified exchanges that are deemed to have high value o Define information exchanges in accordance with NIEM and with guidance from the broader NIEM community

L. DEPARTMENT OF THE TREASURY (TREAS), FINANCIAL CRIMES ENFORCEMENT NETWORK

Information Exchange: Bank Secrecy Act IT Modernization Program – Bulk Data Dissemination

Executive Summary

- Gather Bank Secrecy Act (BSA) data from financial institutions via e-filing and distribute BSA data to stakeholders
- Definition of a common schema that allows Financial Crimes Enforcement Network (FinCEN) to communicate with a wide variety of private sector industries and government stakeholder communities in a simplistic manner while maintaining data integrity
- Support law enforcement, intelligence, and regulatory agencies through sharing and analysis of financial intelligence
- Building global cooperation with counterpart Financial Intelligence Units (FIU)

Stakeholders

- Support of 165 Federal, State, and Local agencies by issuing 6,500 intelligence reports per year
  - Department of Justice
  - Department of Homeland Security
  - Intelligence Community
  - Internal Revenue Service
  - Financial Services Industry Regulatory and Oversight Agencies
- G-7 Financial Action Task Force (FATF)
- Global Network of Financial Intelligence Units

Cross Domain Opportunities

- Finance Management Community of Interest (COI)
  - Casino and Gaming Industry
  - Depository Institutions
  - Insurance Industry
  - Mortgage Industry
  - Securities/Futures Brokers and Dealers
- Intelligence COI
- Justice/Law Enforcement COI
- Suspicious Activity Reporting (SAR) COI

Readiness

- The first release of modernized BSA systems will provide a NIEM-compliant BSA information exchange format
- BSA Bulk Data Disseminations system will develop NIEM-compliant data exchange templates to standardize information sharing across a diverse audience of law enforcement organizations

Potential Success Stories	Milestones/Commitment to Use NIEM
• Enhancing National Information Exchange Model's (NIEM) financial modeling capabilities through the creation of finance and crime specific concepts • Federal, State, and Local Law Enforcement agencies can begin with a reusable template that can be easily tailored to its individual needs • The BSA Bulk Data Dissemination system will develop NIEM-compatible data exchange templates to standardize information sharing across many Law Enforcement organizations • Information exchange will promote reusability and consistency of information usage while enhancing the quality of Law Enforcement decision making • Potentially provide broader capabilities to the current NIEM Justice domain in dealing with financial crimes both nationally and internationally • Potential efficiencies when performing information exchange with the IRS (dependent upon Internal Revenue Service - IRS adopting NIEM)	• First release of the modernized BSA systems will provide a NIEM-compatible BSA information exchange format • During the transition from As-Is State to the To-Be State, FinCEN will provide to its BSA information consumers both the existing fixed field format as well as the new NIEM-compatible format • Providing eXtensible Business Reporting Language (XBRL), TaxXML, and/or UCore compatible formats used in the Regulator, IRS, and Intelligence Communities, respectively, is under consideration for future releases of the modernized BSA systems

M. DEPARTMENT OF THE TREASURY (TREAS), INTERNAL REVENUE SERVICE

Information Exchange: Modernization Electronic Filing (MeF) XML Exchange

Executive Summary	**Stakeholders**

• The Modernization Electronic Filing (MeF) XML Exchange framework is used in Internal Revenue Service (IRS)strategic initiatives for:
  o Receipt of electronic returns
  o Create/use electronic tax forms
  o Transform electronic tax returns for downstream processing
  o Share transactional data among multiple projects and systems
• IRS currently maintains a large vocabulary with numerous redundant terms, message components, messages, and interfaces. In the future vocabulary will be shared across project models allowing the creation of messages based on universally understood components and terms
• Overall agency goal to define an enterprise-wide data environment to more easily and efficiently organize, identify, share, reuse and correlate data that enables the business to consume information and maximize value to the agency
	• Department of the Treasury
	• IRS
	• United States Taxpayers
	  o Individual
	  o Corporate
	  o Partnership
	  o Exempt Organizations
	  o Excise Tax Returns
	• Financial Services Industry

Cross Domain Opportunities	**Readiness**
• Federal and State Community of Interest (COI) • Financial Management COI	• The complete nature of IT modernization and the amount of effort required to modernize, including a fully National Information Exchange Model (NIEM)-conformant state, is difficult to comprehend when looking at different components separately • Pre-existing governance structures involving external stakeholders will necessitate significant coordination and agreement in advance of the full

	adoption of NIEM for MeF XML exchange • Lack of a Taxation Management domain within NIEM limits the ability of the IRS to fully adopt the NIEM framework • What are and who incurs the costs for creating a new NIEM domain • NIEM documentation should include practical guidance needed on how to mitigate the risks and control changes resulting from NIEM adoption • The NIEM Information Exchange Package Documentation (IEPD) process should be expanded to address practices for information exchange in an IT environment with rich legacy systems and not just focus on new development or modernized environment • Provided sufficient funding, training, resources, etc, IRS will continue to strive to be more NIEM conformant • IRS has determined that greater conformance is the appropriate alternative but a pragmatic approach is necessary to ensure maximum benefit is derived without undue cost and impact to the IRS and United States taxpayers
Potential Success Stories • Enhancing NIEM's financial modeling capabilities through the creation of tax specific concepts • Tax-related NIEM conformant exchanges would cross Federal, State and Local government, private and public sector, and United States taxpayers • IRS Forms could align to NIEM conformant IEPDs creating a reusable library of IRS Electronic Forms that could be reused each year as updates become necessary	**Milestones/Commitment to Use NIEM** • No significant milestones identified • The IRS IEPD Life Cycle is consistent with the NIEM IEPD Life Cycle • The IRS Interface Control Document includes all mandatory NIEM IEPD artifacts and allows for all optional artifacts used for external exchanges • Current IRS information exchange governance processes are aligned with the NIEM governance methodology • IRS is currently working on leveraging the NIEM tool architecture • Based on the IRS Office of Management and guidance documentation the following should be

	considered for future consideration of NIEM: o Assess risk to stakeholders of making the MeF XML exchange NIEM conformant o Assess the business case requiring the creation of a NIEM Taxation Management domain 1. Engage the NIEM Program Management Office 2. Identify domain steward 3. Identify exchange partners 4. Identify common exchange concepts 5. Analyze ability to map current MeF XML exchange concepts into the NIEM model

N. DEPARTMENT OF TRANSPORTATION (DOT)

Information Exchange: Suspicious Activity Reporting

Executive Summary	**Stakeholders**

• The desired outcome is to standup a department-wide capability to manage and share Suspicious Activity Reporting (SAR) SAR information
• The value expected is DOT's full participation in the national SAR effort, and ultimately to contribute in preventing another terrorist-type surprise attack on the nation; the information exchange at DOT is considered to be of high-value
• Currently, DOT creates SAR information, and currently stores this information on five different databases:
  o **Federal Aviation Administration (FAA)** – Internal Security Incident SAR database
  o **FAA** - Aviation Systems Operation Security Event Log
  o **FAA** – Cyber Incidents database
  o **Federal Motor Carrier Safety Administration (FMCSA)** – SAR database
  o **Pipeline and Hazardous Materials Safety Administration (PHMSA)** – Hazmat Intelligence Portal (HIP)
• DOT believes that these databases are prime candidates for consolidation to meet the Presidential Nationwide Suspicious Activity Reporting Initiative (NSI) directive
• DOT is proposing that the National Information Exchange Model (NIEM) be used, and implemented with the Information Exchange Package Documentation (IEPD) Life Cycle standard methodology
	• DOT
	• Federal/State/Local Law Enforcement

Cross Domain Opportunities	Readiness
• Chemical, Biological, Radiological, Nuclear (CBRN) Community of Interest (COI) • Immigration COI • Infrastructure Protection COI • Intelligence COI • Justice/Law Enforcement COI • Transportation COI	• DOT is in the early definition and planning phases of this effort • DOT recognizes the need for a central repository for SAR information; both with the Department and for the exchange of such information with external entities • DOT is in the early stages of contracting for support help in consolidating the information • The support effort will help DOT in scoping the project in terms of methodology, governance, training, needed toolsets, and opportunities for reuse from the existing databases
Potential Success Stories	**Milestones/Commitment to Use NIEM**
• Develop a central repository for all DOT SAR information based on NIEM conformant IEPDs that supports the National SAR Program, engages the Intelligence Community and law enforcement organizations involved in Counterterrorism, and shares critical information as needed	• DOT believes that the consolidation of these databases align with NIEM's value proposition and should be implemented with the Information Exchange Package Documentation (IEPD) Life Cycle standard methodology • The project would be central to DOT's mission, and cross-cutting in scope • The funding appears to be available for the initial, definition effort needed to scope the project implementation

O. DEPARTMENT OF VETERANS AFFAIRS (VA)

Information Exchange: Veterans Benefits Administration, National Cemeteries Administration, Veterans Health Administration

Executive Summary	**Stakeholders**
• The Veterans Affairs Administration has three mission-related information exchanges where there may be potential future use of National Information Exchange Model (NIEM): o **Veterans Benefits Administration (VBA)** – Currently exchanges information with several business partners and is in the process of developing its overarching segment architecture including an information sharing architecture for internal and external information exchanges for which they are investigating/evaluating NIEM o **National Cemeteries Administration (NCA)** – Single information exchange with the Defense Manpower data Center (DMDC). NCA Plans to join VBA in any modernization efforts. o **Veterans Health Administration (VHA)** – Working with the Federal Health Community to standardize information exchanges • The VHA contends that the Federal agencies in the healthcare domain have several business and technical requirements not currently support by NIEM • The VHA has described those requirements and proposes an approach by which these agencies may actively collaborate with the NIEM Program Management Office to meet the requirements	• Department of Veterans Affairs o VBA o NCA o VHA • Department of Defense • Federal Health Architecture program (FHA) • Department of Health and Human Services (HHS) • Office of the National Coordinator for Health Information Technology (ONC) • Federal Health Interoperability Modeling and Standards program (FHIMS)

Cross Domain Opportunities	Readiness
• Defense Communities of Interest (COI) • Federal/State/Local COI • Health COI • Human/Family Services COI	• Twenty Federal agencies have partnered to establish a common architecture for the Health Segment of the Federal Enterprise Architecture (FEA); the Health Segment Architecture is jointly developed by the partner agencies through the FHA program • The VHA helped lead the effort to establish a healthcare domain Information Modeling effort with the FHA • The FHIMS seeks to build models in close collaboration among partner agencies and to coordinate with Healthcare IT Standards Development Organizations (SDOs) • Although VHA health standards architects feel that NIEM does not meet all the needs of the healthcare segment, they agree that NIEM should play an important role in the health segment of the FEA • VHA proposes to work with the FHA to mature a broader architectural methodology in which NIEM would be the core component • VHA will require that NIEM: 1. Improve support for external terminologies in order to maintain current levels of semantic interoperability 2. Support the requirements deriving from health care exchange legislation/regulations such as The Health Insurance Portability and Accountability Act (HIPAA), Executive Orders 1335 and 13410, HITECH, and Title 38 3. Improve support for current Health Care Informatics industry standards such as Health Level 7 (HL7), National Council for Prescription Drug Programs (NCPDP), etc. 4. Evolve into a truly platform independent information model used to support NIEM implementations

	and not just an XML schema representation 5. Improve applicability to non-messaging interoperability paradigms such as Service Oriented Architecture • VHA proposes that the above deficiencies be addressed by the entities within the FHA
Potential Success Stories • The creation of a NIEM conformant joint virtual lifetime electronic record (Virtual Lifetime Electronic Record – VLER) that will improve care and services to transitioning veterans by smoothing the flow of medical records between the Defense and Veterans Affairs departments • The conformance with NIEM as part of the VBA's Information Sharing Architecture for internal and external information exchanges	**Milestones/Commitment to Use NIEM** • No significant milestones identified • NIEM can be integrated with the current best practices in the healthcare domain • VHA recommends that the information and terminology modeling for the Healthcare Domain of the NIEM be developed as part of existing efforts at the Federal Health Architecture, notably the HHS/ONC/FHA/FHIMS program • The FHIMS program is a focal point for healthcare-related standards, information modeling, and terminology development for the Healthcare Segment, and would be a natural fit for NIEM Healthcare Domain efforts • Healthcare subject matter experts within the VHA and partner agencies have Stated support of the HHS/ONC/FHA adoption of NIEM and are planning to lend expertise in this arena • VBA architects plan to investigate and evaluate using NIEM while developing the "to-be" architecture beginning in 4th quarter 2010

P. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Information Exchange: Air Quality System XML Data Exchange

Executive Summary	**Stakeholders**
• Environmental Protection Agency (EPA) is one partner within the Exchange Network (EN), a national network that includes all 50 States, nine Tribes, one territory, and ten EPA Regional Exchange Network Grant Coordinators, in which environmental data is exchanged among trading partners (States, Tribes, other Federal agencies, industry, international) using node and Web Services technology • The importance of the AQS is evidenced by the fact that states are creating regional information exchanges to improve regional understanding of air quality. The business scenario is for the Air Quality Data Exchange (AQDE), which is a requested revision to an Air Quality System (AQS) data exchange and is an example of how U.S. EPA's data exchange partners are reusing U.S. EPA data exchanges for regional and/or local purposes. • The EN reuse model is: o Well established o Focuses on the EN's environmental data flows o Has been agreed to by all U.S. EPA partners o Essentially maps to the NIEM process	• Federal/State/Local/Tribal/Private Entities • United States Citizens
Cross Domain Opportunities	**Readiness**
• The EPA wants to continue to dialogue and work with the agencies that are partnering with NIEM to identify opportunities for collaboration and partnership o Chemical, Biological, Radiological,	• EPA feels the EN has very mature processes and a secure transport infrastructure for environmental data exchanges which consists of more than 54 data flows, with 10 more in development, between EPA and its State and Tribal partners, with ten more data flows under

Nuclear (CBRN) Community of Interest (COI) o Emergency Management COI o Infrastructure Protection COI o Intelligence COI o Interior COI o International Trade COI o Justice COI o Maritime COI o Screening COI	development • For all intents and purposes, the EN reuse model for standardized data elements in data flows is equivalent to the NIEM reuse model • EPA sees no current benefit in changing to the NIEM reuse model
Potential Success Stories • In the future, EPA could adopt National Information Exchange Model (NIEM) and facilitate information sharing with a wider audience than its current partnerships	**Milestones/Commitment to Use NIEM** • EPA sees no current benefit in changing to the NIEM governance model since the EN governance structure is well established, has acceptance from all EPA partners, and focuses on EPA's environmental mission • EPA cannot report at this time if it will conform to the NIEM processes and model • EPA must work with the EPA National Program Managers, States, Tribes, and its other partners to reach a decision on whether, or when, to adopt the NIEM model and processes for the creation of information exchanges

Q. GENERAL SERVICES ADMINISTRATION (GSA)

Information Exchange: Online Representations and Certifications Application and Federal Procurement Data System – Next Generation Submission to USASpending.gov

Executive Summary

Information Exchange 1: Online Representations and Certifications Application (ORCA)

- As a presidential E-Government initiative managed by GSA the Integrated Acquisition Environment (IAE) has facilitated every phase of the acquisition life cycle, from market research to contract administration
- IAE is currently undertaking an architectural consolidation effort to migrate the nine operational systems onto a single platform which includes a data normalization project in which all the nine systems' data will be migrated to a single relational database
- On-line Representations and Certifications Application (ORCA) eXtensible Markup Language (XML), a Business to Business component system of the IAE, is designed to replace the paper-based process for handling representations and certifications

Information Exchange 2: FPDS-NG Submission to USASpending.gov

- As a presidential E-Government initiative managed by General Services Administration (GSA), the Integrated Acquisition Environment (IAE) has facilitated every phase of the acquisition life cycle, from market research to contract administration
- IAE is currently undertaking an architectural consolidation effort to migrate the nine operational systems onto a single platform which includes a data normalization project in which all the nine systems' data will be migrated to a single relational database
- Federal Procurement Data System - Next Generation (FPDS-NG), a component system of the IAE, is designed to provide procurement data regarding contracts

Stakeholders

- Contract Officers
- Federal Agencies
- GSA
- United States Citizens
- Vendors

(whose estimated value is $3,000 or more) to USAspending.gov	
Cross Domain Opportunities • Federal Community of Interest (COI) • Financial Management COI	**Readiness** • Scenario planning and business taxonomies are already in place and given that requirements analysis would need to be done regardless of National Information Exchange Model (NIEM), no additional effort would be required • Given that there is no existing domain to accommodate acquisition elements, new NIEM-conformant data components would need to be created • GSA has allocated hours for the building, validating, assembly, publication and implementation of the FPDS-NG and ORCA Information Exchange Package Documents (IEPDs) • GSA and IAE's first implementation of NIEM will likely require assistance from the NIEM technical team as well as training • GSA estimates one time training for the following individuals will be necessary for Executives, Project Managers, Developers and Business Analysts • Because this data flow is operational, the least risky and most cost efficient time to move to a NIEM-based ORCA exchange occur when the system is migrated to the common IAE platform in 2012 and a move to a NIEM-based FPDS-NG exchange would occur in 2014 o A potential barrier is the impact to users of the established ORCAXML data flow requiring appropriate arrangements to minimize impact to existing users o Another barrier is quantifying the return on investment, and assuming that the return is positive,

	communicating that value of a NIEM implementation over individual system implementations o Potential barrier is a lack of quantifiable data to justify the development of a NIEM-based implementation for a specific exchange
Potential Success Stories • Enhancing the NIEM model through the creation of acquisition concepts • The implementation of NIEM-conformant exchanges within GSA's IAE would result in acquisition-related NIEM conformant exchanges crossing virtually all Federal agencies and as well as the private sector • The Federal Funding Accountability and Transparency Act (FFATA) of 2006 required that the Office of Management and Budget establish a single searchable website, accessible to the public at no cost to access, to include for each Federal award: o The name of the entity receiving the award; o The amount of the award; o Information on the award including transaction type, funding agency, etc; o The location of the entity receiving the award; o A unique identifier of the entity receiving the award.	**Milestones/Commitment to Use NIEM** • The ORCA and FPDS-NG systems are part of an overall initiative within the IAE to migrate nine systems to a common platform. There is the potential for the FPDS-NG XML representation and the ORCAXML to be migrated to NIEM-compliant XML as part of the move to the common platform • A requirements package for the common IAE platform will be developed for ORCA in late 2010 and will include a statement directing third-party developers to be NIEM-compliant • It is anticipated that the work to be done by the third-party developers will occur in early 2012 for ORCA and in 2014 for FPDS-NG; this is the best case for implementation of a NIEM-based model • The worst case for implementation would be if creating the NIEM IEPD was found to be cost prohibitive and the implementation of a NIEM-based model did not occur • Implementation would be a longer term goal given that the data flow is operational; it is least risky and most cost-efficient to plan for migrating to NIEM during the transition of the flow to a common platform under IAE • The additional time will also allow GSA to gain an increased understanding of NIEM and take preparatory actions such as identifying shared data elements; also assessing the potential value of NIEM and explore the viability of GSA's involvement in establishing an acquisition domain in concert with other

	key participants

R. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

Information Exchange: Contractor and Financial Information Sharing Exchange

Executive Summary	**Stakeholders**
• NASA has challenge of an extraordinary amount of data, much of which is available for consumption outside of NASA • NASA does not have an enterprise-wide governance policy to oversee the definition, integration, and control of this data • Agency uses Integrated Enterprise Management Program (IEMP) and its relationship to exchanging information with Contractor Financial Management systems; NASA uses 5 process groups that make up the NASA Office of the Chief Information Officer's (OCIO) strategic lifecycle • The key components in this information exchange are the Contractor System, the NASA Form 533M, and the NASA Core Financial System • The intent of this information exchange is to allocate contractor costs to funded accounting line items in NASA's system of record for financial data • Once the contractor generates the NASA Form 533M from their Contractor System, they transmit the form to NASA for processing and NASA then undertakes a manual allocation effort to apply the costs to account line items	• Commercial Industry • Educational Institutions • Federal Agencies • Grantees • International Organizations
Cross Domain Opportunities	**Readiness**
• Federal Communities of Interest (COI) • Financial Management COI • Grantee COI	• NASA uses Enterprise Architecture artifacts to facilitate reuse • NASA does not have an enterprise-wide governance policy to oversee the definition, integration, and control of this data

• Grantor COI • Grants Management COI • International COI	• The NASA Office of the Chief Information Officer (OCIO) will be formulating a plan to establish more formal management of NASA's information architecture and exchanges. It has already developed an Information Management Policy Guide which outlines many of the unique information management issues of the Agency that will need to be considered in it ultimate policy and process • A more thorough review of NIEM and its ability to address NASA's information exchange development needs will be conducted throughout the year
Potential Success Stories • There are several cost-sharing agreements and reuse benefits that could be established to support development, maintenance, and governance of the information interfaces • Since NASA's eGov initiatives are based on the Federal eGov initiatives, the potential for the reuse of these information exchange package designs exists that could potentially reduce the cost of other eGov initiatives • Currently, many of these interfaces are facilitated through manual integration with NASA forms acting as the information vehicle; providing a common understanding of the information in these interfaces with NIEM facilitation, NASA could communicate to its commercial contractors, grant recipients, international partners, and other Federal government agencies a more effective way to package and communicate well defined and controlled information	**Milestones/Commitment to Use NIEM** • The NIEM lifecycle seems to be complimentary to the NASA lifecycle and no alternatives seem to be necessary • However, NASA must perform more analysis to determine if/how to incorporate NIEM concepts into official policy and governance documentation and then if/how to incorporate NIEM governed Information Exchange Package Documents (IEPDs) into its enterprise architecture artifacts and analysis • Since NASA does not currently have a formal Information Management policy and process, there is a need to re-allocate resources away from other areas to address information architecture which includes: 1. Establishing the charter for an information architecture team 2. Allocating a Chief Information Architect 3. Establishing information architecture enabling tools and technologies and partners (like NIEM) 4. Integrating information architecture concepts into the overall OCIO strategic lifecycle

S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

Information Exchange: Records Management

Executive Summary • NARA states that currently there is a one-way communication of records from Federal agencies to NARA based upon vetted and approved records schedules - and there is no single, canonical record description or format for all types of records across all Federal agencies • Moreover, since all records to be permanently preserved by NARA are provided from the agency to NARA, and NARA in turn makes these records available to the public, there is also no perceived or real performance gap resulting from the records transfer process • NARA was unable to identify any requirements for cross-boundary information exchange, at this time, that would fall under the purview of National Information Exchange Model (NIEM)	**Stakeholders** • Federal Agencies • United States Citizens
Cross Domain Opportunities • Federal Community of Interest (COI)	**Readiness** • NARA was unable to identify any requirements for cross-boundary information exchange, at this time, that would fall under the purview of NIEM
Potential Success Stories • NARA could possibly use Security markings for Controlled Unclassified Information (CUI) for data received from other Agencies	**Milestones/Commitment to Use NIEM** • NARA was unable to identify any requirements for cross-boundary information exchange, at this time, that would fall under the purview of NIEM • In the event that cross-boundary information exchanges with other agencies are identified in the future, NARA will adopt and utilize NIEM

T. NATIONAL SCIENCE FOUNDATION (NSF)

Information Exchange: Research Performance Progress Report

Executive Summary • The Research Performance Progress Report (RPPR) is a new uniform format for reporting performance progress on Federally-funded research projects, resulting from an initiative of the Research Business Models (RBM) Subcommittee of the Committee on Science • The RPPR will be used by agencies that support research and research-related activities for use in submission of interim performance reports. It is intended to replace other interim performance reporting formats currently in use by agencies	**Stakeholders** • Cooperative State Research, Education, and Extension Service (Department of Agriculture) • Department of Defense (DoD) • Federal Research-Oriented Grant Making Agencies • National Aeronautics and Space Administration (NASA) • NSF • Researchers/Grantees
Cross Domain Opportunities • Federal, State, Local Government Communities of Interest (COI) • Grantee COI • Grantor COI • Grants Management COI	**Readiness** • Experience: Research.gov has enabled information sharing between Federal research agencies and the research community, such as: o **Research Spending and Results** – Allows NSF and NASA award information to be searched by the public, including: award amount and recipient, congressional districts for awardee location and where the research is being performed, award abstract summarizing the effort, and citations of journals published o **Grants Application Status** – Enables Sponsored Projects Office staff (SPOs) and Principal Investigators (PIs) to check the status of their applications, from submission to decision, as they are received and reviewed by NSF, United States Department of Agriculture (USDA)/ National Institute of Food and Agriculture (NIFA), and DoD/ARO o **Research Headlines** – Brings news and highlighted research activities from NSF,

	NASA, and USDA/NIFA • **Maturity of Process**: NSF has a mature Systems Development Life Cycle (SDLC) model, which includes defined processes and reusable templates for all phases of the SDLC. NSF SDLC is based on Federal and industry best practices, and addresses cross-phase management processes, such as project management, risk management, change management, etc. o In addition, NSF follows a phased approach to service delivery, offering services as a pilot to a limited audience before broader launch to ensure that the service fulfills requirements and meets the needs of the research community. o The RPPR will serve as a pilot for broader National Information Exchange Model (NIEM) implementation, enabling NSF to apply NIEM principles to additional services while applying lessons learned and best practices from the RPPR launch. • **Modern Technology Platform:** Research.gov's architecture is comprised of leading technologies, including best-of-breed commercial off-the-shelf (COTS) products. By integrating technologies such as Service Oriented Architecture (SOA) and enterprise portal services, Research.gov can distribute and pull information from multiple locations, including partner agency systems. Because these tools are available through COTS products, Research.gov can develop and deliver new capabilities, such as the RPPR service, in an innovative, timely, and sophisticated manner.
Potential Success Stories • The RPPR will directly benefit award recipients by making it easier for them to administer Federal grant and cooperative agreement programs through standardization of the types of information required in interim performance reports-thereby reducing their administrative efforts and costs	**Milestones/Commitment to Use NIEM** • NIEM will be used to create an Information Exchange Package Documents (IEPD) based on RPPR data fields. Two supporting IEPDs will be created: o **Report Periods:** This IEPD will provide the award reporting period so that researchers can be made aware of when an Annual Project Report is due,

• RPPR will also make it easier to compare the outputs, outcomes, etc. of research programs across the government	as defined by the Federal agency requiring the report o **Report Acknowledgement:** This IEPD will provide an acknowledgement regarding the status of the submitted report as provided by the receiving Federal agency • The applicability of NIEM to final performance reports will be assessed after piloting NIEM with the Annual Project Report • Creation of a Grants Management domain is being considered within the Grants Management LoB

U. NUCLEAR REGULATORY COMMISSION (NRC)

Information Exchange: Document Based Information Exchange

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Executive Summary

- NRC data exchange with external entities is document-based or takes the form of mutually accessible databases
- NRC is in the process of evaluating areas of opportunity for automated data exchange that would support machine-readable formats; potential solutions include:
  - **Scenario 1** – The exchange of construction and construction inspection scheduling information for new reactors and Mixed Oxide (MOX) Fuel Fabrication facilities
  - **Scenario 2** – The exchange of new reactor design information once standard designs have been certified
- Near-term Plan: Roll out electronic data exchange for Scenario 1
- Long-term Plan: Standardize the data schema for these exchanges and others identified interfaces in the future

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Stakeholders

- Federal/State/Local/Tribal Entities
- Non-governmental Organizations
- Nonprofit and Private Entities
- International Nuclear Regulatory Community

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Cross Domain Opportunities

- Environmental Protection Agency (EPA) Community of Interest (COI)
- Chemical, Biological, Radiological, Nuclear (CBRN) COI
- Infrastructure COI

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Alternative Analysis

- No alternative approaches have been identified

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Potential Success Stories

- NRC indicated that NRC is in the process of evaluating areas of opportunity for automated data exchange that would support machine-readable formats and is looking for new, repeatable processes that

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Milestones/Commitment to Use NIEM

- NRC determined that because this function is scheduled for deployment in late 2010, we do not have sufficient time and resources to carry out the necessary steps for NIEM adoption

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can be streamlined by such automation • The National Information Exchange Model (NIEM) framework could be utilized to accomplish the standardization and automation of these data exchanges as well as provide a repeatable process along with governance • NRC is expanding radiation protection in the area of border protection and internal security, to address the potential malevolent use of radioactive material; as part of this effort, the NRC works with the Department of Homeland Security's (DHS's) Domestic Nuclear Detection Office (DNDO) to implement the U.S. border and internal security initiatives for certain radioactive materials • There is an opportunity to utilize NIEM's CBRN domain for the information exchange between the NRC and DNDO • There is an opportunity to collaborate with DNDO and the Department of Energy to enrich the NIEM CBRN domain	• NRC plans to carry out these steps after deployment: o NIEM training o Define scope of change o Define timeline and plan for implementation o Definition of NIEM-compliant terms with NRC data exchange partners o Data analysis o Data mapping o Building and validating NIEM subset schema o Coordinate changes with data exchange partners o Package and publish final schema to repository

V. OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE (ODNI)

Information Exchange: Enterprise System Audit

Executive Summary	**Stakeholders**
• With the move toward an enterprise service-based environment, there is a need to develop an enterprise audit capability for audit collection and audit sharing in support of statutory and analysis requirements of the Counterintelligence (CI), Information Assurance (IA), Information Sharing (IS), Intelligence Community Oversight (ICO), and Law Enforcement (LE) communities with consideration of privacy concerns • To enable an enterprise wide audit exchange, the proposed audit capability will include: o Information exchange specifications for audit data o Converged format and methods for audit data and best practices o Mature audit-sharing capability within each IC element to handle multiple needs	• Air Force Intelligence • Army Intelligence • Central Intelligence Agency • Coast Guard Intelligence • Defense Intelligence Agency • Department of Energy • Department of Homeland Security (DHS) • Department of State • Department of the Treasury • Drug Enforcement Agency • Federal Bureau of Investigation • IC Chief Information Officer • Marine Corps Intelligence • National Geospatial-Intelligence Agency • National Reconnaissance Office • National Security Agency • Navy Intelligence • Office of the Director of National Intelligence
Cross Domain Opportunities	**Readiness**
• Intelligence Community of Interest (COI) • Justice/Law Enforcement COI	• No indication was provided that the referenced information exchange will make use of the NIEM model. An alternative standard is not presented in the development of the information exchange. • See Readiness under the DoD Counter

	Improvised Explosive Device (C-IED) Information Exchange
Potential Success Stories /Current Use Within DoD • See Potential Success Stories/Current Use Within DoD under the DoD Counter Improvised Explosive Device (C-IED) Information Exchange	**Milestones/Commitment to Use NIEM** • See Milestones/Commitment to Use NIEM under the DoD Counter Improvised Explosive Device (C-IED) Information Exchange

W. SOCIAL SECURITY ADMINISTRATION (SSA)

Information Exchange: State Verification and Exchange System

Executive Summary	**Stakeholders**
• SSA has examined the State Verification and Exchange System (SVES), a high volume system that processed over 599 million requests for information, such as SSN Verifications, in FY09: o SVES is a multi-purpose exchange system that provides authorized partners with a standardized method of obtaining SSN verification and Title II & Title 16 benefit information o SSA recently added routines to the SVES system to confirm that a claim of U.S. citizenship by Children's Health Insurance Program (CHIP) or Medicaid applicants was consistent with SSA's records, as mandated by the CHIP Reauthorization Act of 2009 • SSA does not believe that the adoption of the National Information Exchange Model (NIEM) and its processes would be in the best interest of the agency, but SSA will, however, continue to evaluate and incorporate NIEM standards where ever appropriate	• Federal/State/Local/Tribal Government Entities • SSA
Cross Domain Opportunities	**Alternative Analysis**
• Finance Management Community Of Interest (COI) • Health COI • Human/Family Services COI • Immigration COI	• SSA's major exchange systems were developed well before the introduction of NIEM • For SSA's major exchange systems, becoming NIEM-conformant would be resource intensive and would pose a burden on a highly diverse group of our partners and users • SSA has a well developed Software Development Life Cycle (SDLC) methodology which is used for all software development and is described and supported by the Project Resource Guide (PRIDE) where standards

	documents, procedures, policies, required documentation, necessary forms and a tools guide are detailed • The model is flexible, allowing projects of various sizes and running on different platforms to have options for tailoring the life cycle process to meet the specific need • Governance of data exchanges falls under the direction of SSA's Strategic IT Assessment and Review (SITAR) Board • Given the existence of well-developed IT governance procedures, the small amount of actual software development in the information exchange arena, and the cost of creating a new governance structure, the SSA is unable to justify the costs associated with creating a separate governance methodology for information exchange activities • SSA provides help desk services for its information exchange partners with dedicated support and helpdesk services to its user community as well as users within SSA • SSA's reuse model is to build software that will serve a large constituency, and then to provide modifications to and tailoring of the software as new requirements emerged • The SVES system is reused about 200 times, i.e. it supports 200 disparate users within the exchange user community • The SSA feels the SSA reuse model represents the most economical way for the agency to support its current and future information exchange requirements; SSA bases this decision not only on its own costs but also on the impact it would have on its user community • With the large number (3,500) of information exchange activities already being serviced along with the disparate user communities, the time the systems have been in use, the general satisfaction level with the current processes, and the time-tested procedures supporting them, we have difficulty rationalizing the

	conversion of our current exchange processes to the NIEM model • Use of the NIEM model would require a large allocation of resources and effort • In SSA's estimate it would require significant changes for both the agency and the user community in addition to the large investment to utilize the model and consequently, the SSA does not see a reasonable return on investment
Potential Success Stories • Opportunities for NIEM-conformant cross boundary exchanges: o **Veterans Affairs** – Confirming veterans benefits o **Agriculture** – Disaster assistance verification of living status of claim submitter o **Health and Human Services** – State Children's Health Insurance Program o **Labor** – Unemployment verification o **Emergency Management** – Federal Emergency Management Agency's Disaster Assistance Improvement Plan has an existing working exchange with SSA to verify identify for the change of address in the environment of a disaster, etc.	**Milestones/Commitment to Use NIEM** • No milestones were identified • The SSA will continue to evaluate and incorporate NIEM standards where ever appropriate