⟨ N I E M ⟩ milops

National Information Exchange Model

Military Operations Domain (MilOps) Operations & Maintenance Plan

6 June 2014

STUART A. WHITEHEAD, SES
DD C5I, J6
20 October, 2014

Document Change Control Page

No.	Approver	Date	Description
1	Domain Steward		Initial Release

Table of Contents

References

These references provide key information regarding the establishment of the MilOps Domain and make available additional information regarding NIEM adoption.

a. DoD CIO memo "Adoption of the National Information Exchange Model in the Department of Defense", 28 March 2013.[1]

b. Office of Management and Budget, Digital Government: Building a 21st Century Platform to Better Serve the American People (May 23, 12012), available at http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government-strategy.pdf.

c. Presidential Memo M-13-13, May 9 2013, Open Data Policy-Managing Information as an Asset.

d. DoDI 8320.02, Implementing the Sharing of Data, Information, and Information Technology (IT) Services in the Department of Defense, 5 August 2013.

e. DoD Information Enterprise Architecture (DoD IEA), Version 2.0, 10 August 2012.

f. Establishing Domain Governance: Making Self-Service a Reality, NIEM Business Architecture Committee , February 2009, v1.0.

g. NIEM High-Level Version Architecture, NIEM Technical Architecture Committee (NTAC), 31 July 2008, v.1.0, available from http://reference.niem.gov/niem/specification/high-level-version-architecture/1.0/high-level-version-architecture-1.0.pdf.

h. National Information Exchange Model (NIEM) Naming and Design Rules, NTAC, 31 October 2008, v.1.3, available from https://www.niem.gov/documentsdb/Documents/Technical/NIEM-NDR-1-3.pdf.

i. National Information Exchange Model (NIEM) Military Operations (MilOps) Domain Charter, 30 October 2013.

j. NIEM Business Architecture Committee (NBAC) Charter, 28 June 2013.

k. Joint Staff J6 DDC5I memo "NIEM v3.0, MilOps v1.0 Domain Update", 18 December 2013.

l. DoD data Service Environment, https://metadata.ces.mil/dse/policy.

j. NIEM IPED Clearing House, http://it.ojp.gov/framesets/iepd-clearinghouse-noClose.htm.

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[1] Introduces the concept of "consider NIEM First".

1   Introduction

1.1   Overview

The Department of Defense Chief Information Officer (DoD CIO) has identified the National Information Exchange Model (NIEM) as an optimum standards-based approach for improving the interoperability and standardization of DoD information exchange content. NIEM offers a proven approach for developing standardized, reusable information exchange packages and has been adopted across international, federal, state, local, and tribal organizations. The adoption of NIEM and use of the MilOps Domain will facilitate information exchanges between the Department, the remainder of the Federal government, state, local and tribal entities as well as an increasing number of other nations and non-governmental entities.

1.2   Document Scope

This Operations and Maintenance (O&M) Plan describes the functions and processes used to manage the configuration of MilOps Domain content, and supplements the MilOps Domain Charter.

2   Domain Governance

The MilOps Domain governance structure (see Figure 1) is headed by the Domain Steward, who is supported by a MilOps Domain Configuration Control Board (CCB). Responsibilities of each entity are described in the MilOps Domain Charter.

NIEM PMO

NIEM Program Office

MilOps Domain

Domain Steward
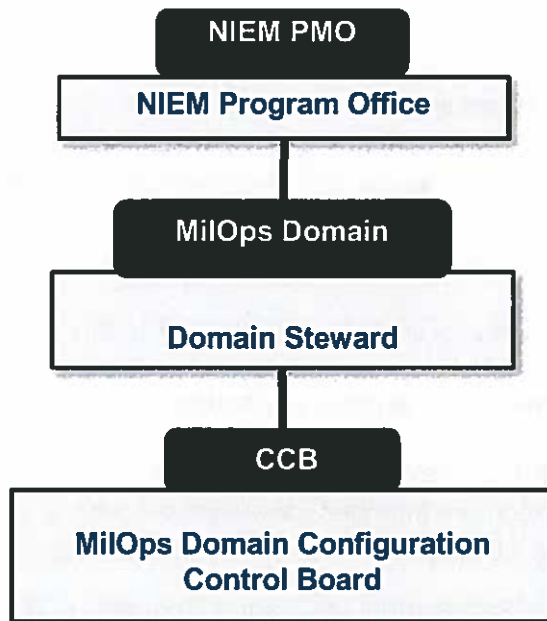
CCB

MilOps Domain Configuration Control Board

Figure 1: MilOps Domain Governance Structure

2.1 MilOps Domain Configuration Control Board (CCB)

The CCB manages Domain content and addresses content issues arising from the development and use of Information Exchange Package Documentations (IEPDs)[2]. Domain content is comprised of data components that fall within the scope described in MilOps Domain Charter. MilOps data components are intended to represent proven information sharing design building blocks that are recognized by the CCB as being valuable for reuse across the domain by information exchange developers.

The CCB provides limited assistance to implementers by providing business and technical expertise in the use of the MilOps Domain content and creation of IEPDs. CCB functions include but are not limited to:

- Evaluate and decide on proposed changes to the content of the MilOps Domain model
- Make recommendations for possible elevation of MilOps Domain content to NIEM Core
- Make recommendations for changes to NIEM Core based on DoD experience
- Harmonization of MilOps Domain content across the NIEM domains
- Assist in implementation concerns by MilOps Domain or other NIEM domains users

The CCB is chaired by the Domain Steward's designated representative. CCB membership is composed of DoD and non-DoD stakeholder organizations with a confirmed and vested interest in establishing, maintaining, and applying MilOps Domain data components to improve information sharing. Vested interest is defined as development of an IEPD that defines an actual information exchange that will utilize both the NIEM technical framework and MilOps Domain content.

Organizations apply for CCB membership to the CCB chair, and provide names for their primary and secondary representatives. Representatives should be formally designated by their organization to represent concerns and communicate between the MilOps Domain Steward and their organization. The CCB Chair reviews memberships periodically with the Domain Steward and solicits assistance in fostering membership to represent an inclusive stakeholder. Membership roster and criteria will be posted to the MilOps Domain website.

New member reference information is provided in Appendix 2 to this document.

The Domain Steward's organization shall provide a resource to serve as the CCB Secretariat.

The Lead Domain Modeler (LDM) is a key position on the CCB, and serves as the Domain's authoritative point of contact for content inquiries, development advice, and technical configuration management. Key LDM responsibilities include but are not limited to:

- Provides CCB a technical assessment of Change Requests (CRs) and works with CR submitter to resolve technical issues
- Provides chair CR (review readiness) agenda recommendations

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[2] Information Exchange Package Documentation (IEPD) – An MPD that contains NIEM-conformant schemas that define one or more recurring XML data exchanges. http://reference.niem.gov/niem/specification/model-package-description/1.1/model-package-description-1.1.pdf

- Prepares domain updates for CCB review and prepares technical opinions
- Provides chair domain update agenda recommendations
- Primary representative of domain on all content matters;
- Primary technical interface to the NIEM Business Architecture Committee (NBAC) Release Manager and other NIEM Domain LDMs;
- Primary POC regarding domain content submission entry in the NIEM Configuration Control Tool (NCCT).

2.2 O&M Activities

CCB performs configuration management of content and promotes reuse of information exchange artifacts as described in the NIEM MilOps Domain Charter, Section 5.2. Also, per the MilOps Domain Charter, the CCB is empowered to form sub-working groups and/or tiger teams to achieve the following types of activities (not all inclusive):

- Perform working-level coordination of issues to achieve NIEM program and Departmental objectives.
- Work cross domain and NBAC harmonization initiatives.
- Perform harvesting and migration content CR preparation
- Investigate, document, and promote MilOps information exchanges
- Provide inputs to policy and guidance as appropriate
- Assist in the production of the artifacts needed to support development of NIEM-compliant information exchange tools by MilOps Domain users.
- Conduct outreach and communications efforts to existing and potential DoD participants.

3   Domain Content Management

The MilOps Domain provides a venue to improve information exchange interoperability through use of the NIEM framework, common data components and Extensible Markup Language (XML). The MilOps Domain's content management functions are grouped into three main focus areas: Content Configuration Management, Content Change Request Management, and facilitation of IEPD development. The remainder of this section prescribes how the CCB shall perform harmonization and stakeholder engagement functions.

3.1   General

The CCB shall meet via conference call on a quarterly schedule, or as required to address urgent changes. The CCB shall hold one annual face-to-face session. Meetings are open to all participants in the Domain, subject to the classification level of content being discussed.

The CCB shall utilize a consensus based approach for decision making. The CCB Chair will strive to resolve conflicting issues among the CCB membership; however in cases where consensus cannot be achieved, the Chair may request a formal review and decision by the Domain Steward for final resolution.

3.2   Content Configuration Management

The MilOps Domain baseline Version 1 was approved by the Domain Steward and promulgated to the NIEM PMO on 18 December 2013.[3] The MilOps Domain model consists of both 'mission partner specific' content, and 'publicly accessible' content. This construct is intended to maximize information exchange opportunities with entities outside of DoD, but also ensures optimal information exchanges within the Department. Figure 2 below depicts the technical architecture supporting the dual use content. Each of the blue and red boxes in the diagram (e.g., NIEM Core, MilOps Public, MDA, etc.) represents content in separate XML namespaces. The red box denotes mission specific content that is not publicly accessible. As represented, mission partner specific content references core and domain content necessary to construct mission partner specific vocabulary.

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[3] Joint Staff J6 DDC5I memo "NIEM v3.0, MilOps v1.0 Domain Update", 18 December 2013.
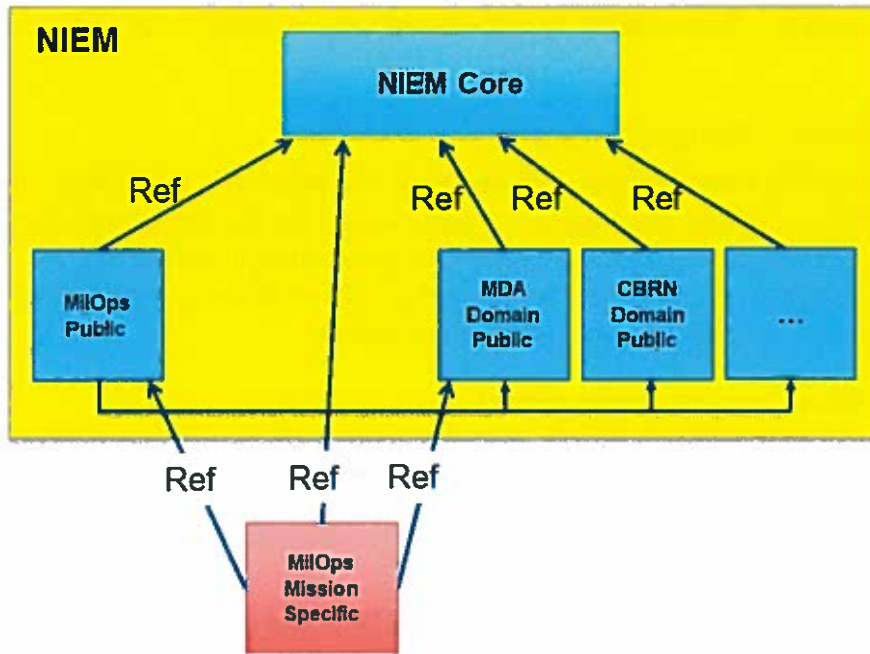
Figure 2: MilOps Domain Dual Use (Public / Mission Specific) Construct

The MilOps Domain's functions and processes for producing and managing domain content are coordinated by the CCB as described below:

3.2.1 Domain Updates (DU)

The MilOps Domain Steward publishes approved updates to the domain content and works with the NBAC to have these updates included in future NIEM releases. A DU is a Model Package Description (MPD) that includes DU schema, an XML change log file, an XML catalog file, a conformance report, and other optional documentation, as appropriate.

The CCB performs regular, periodic improvements and corrections in the form of DUs to better meet the needs of domain users. Regularly updating the domain content also helps to reduce configuration workload immediately before and following NIEM minor and major releases, as the updates serve as the most recent input to NBAC reconciliation and harmonization processes. The DU process is described in the NIEM High Level Version Architecture document.

3.2.2 Content Cross Domain Harmonization

The NIEM Configuration Control Tool (NCCT) records and tracks content and technical architectural issues collected from outside sources such as the NIEM Helpdesk, NBAC, NIEM Technical Architecture Committee (NTAC), and LDMs. The CCB considers appropriate issues in the NCCT as part of their regularly scheduled work and makes recommendations to resolve them as inputs for future NIEM content releases or as a MilOps DU.

The Harmonization Master List (HML) identifies components that appear to semantically overlap other components in Core, another domain, or its own domain namespace. The CCB reviews these data components unresolved harmonization issues and makes their recommendations to

resolve them resulting in future NIEM content releases or as a MilOps DU. The HML is updated accordingly

3.2.3 New Domain Content Factors

Data modeling in NIEM balances precision meaning with maximum reusability. New content should be added to a domain when there is a requirement for the data component in multiple IEPDs. Since developing useful information exchanges usually involves multiple perspectives; it is rare to reach consensus on the first representation. The following criteria will be emphasized when assessing new MilOps Domain content submissions:

- NIEM MilOps Domain content criteria)
    - o Is the data required in NIEM information exchanges (IEPD) or messages? (scope)
    - o What kinds of data exchanges use it or would use it?
    - o Is the data reusable in other messages?
    - o Does the data overlap multiple requirement sources (models)?
    - o What data models contain this component or one similar to it? (source / requirement)

- Is the content a characteristic or subpart of an existing (and the appropriate) NIEM type?

- Is the content too specific (not reusable)?
    - o Is it general enough to include in NIEM Core? Should it be generalized?
    - o Is it more specific to a Domain and therefore should be an extension to Core?

- Does the content property or content type overlap with another? Not distinct?
    - o Should it be joined with another component?
    - o Should it be split into multiple components? (too broad)
    - o Should one be selected and the other(s) removed?

- Is the content name relevant and unique to NIEM MilOps?
    - o Is it properly named?
    - o Are the terms of its name meaningful?

- Is the content definition relevant and unique in NIEM MilOps?
    - o Is it defined distinctly from other NIEM core or MilOps? Data components?
    - o Will this component definition be clearly understood by others?

- Is content modeled correctly (structurally correct; correspond well to the real-world)?
    - o Does it have the right base-types and properties?
    - o Is it missing common characteristic or subpart properties (simple/complex)?
    - o Does it contain properties that should be deleted, replaced, or changed?

- How is the content related to other types (objects)?

- How is the content used? (Primary context? Multiple contexts?)

3.2.4 Domain Content Lifecycle Planning

In execution of its domain content management responsibilities, the CCB shall use the following 'business rules':

- MilOps Domain will adhere to the NIEM NBAC life cycle planning for major and minor updates (e.g., major released every three years and minor release annually). MilOps

Domain Published updates may take place as needed and driven by the MILOps Community.

- Maintaining strict backward compatibility is not a limiting imperative in version management.

- Domain updates are evaluated for the current version under management and result in a new release (changes roll forward). In exceptional cases a CR will be considered that results in an update to a prior version.

- Published releases are persistent and versioned.

3.3 Content Update

The MilOps Domain will follow the NIEM versioning scheme. NIEM version architecture defines four types of releases: major, minor, micro and domain update. NIEM release versions are denoted with up to three digits. For example, the last major NIEM release was V3.0. A next future minor release would be NIEM v3.1. A next future micro release would be NIEM v3.0.1. Continuing this pattern, a MilOps DU would be labeled with a four digit version number. For example, the current NIEM MilOps domain 1.0 would be formally referred to as NIEM MilOps v3.0.0.1 domain update. The fourth digit denotes the number of MilOps DUs since the last NIEM release.

The MilOps Domain content update process begins with the recognition of the following triggers supported by a Change Request Submission:

- NIEM Release
- Domain Harmonization
- Domain content addition / deletion / change

3.4 Change Request (CR) Management

Domain change requests may originate based domain stakeholder reviews and new requirements or external to the domain via the NCCT.Upon submission of a CR (Appendix 1) to the CCB, the CCB Secretariat registers the CR. Within 90 days, the LDM produces an Impact and Solutions Assessment (ISA) report. The CCB will review the ISA at its next scheduled meeting and decide future action(s) on the CR. The future action may be determined by consensus at the CCB level or by the Domain Steward if required.

At the end of the CR process the CR is closed w/o action, passed along to the NBAC for NIEM Core issues or accepted as a future update to MilOps Domain content. The MilOps CR process is illustrated in Figure 3 below.
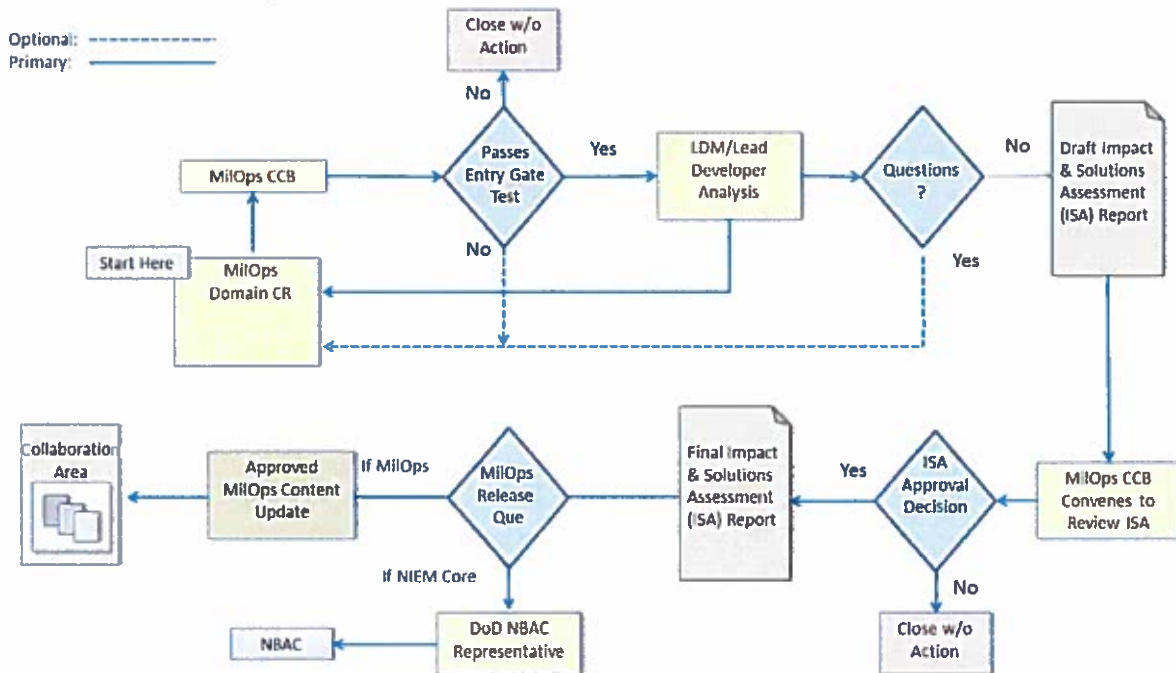
NIEM MilOps Domain CR Process

Figure 3: MilOps Domain Content Update / Change Request (CR) Process

As a matter of routine procedure, the CR originator participates in the assessment and presentation to the CCB. This CR process can be streamlined by using - digital communications to meet emergent requirements as appropriate. The LDM shall report the status of all open CRs as a standing agenda item during CCB meetings.

CR assessment criteria may consider but not be limited to the following:

- Will new content be harmonized with NIEM Core and with the other NIEM domains?
- Does the new content conform to MilOps Domain data definitions?
- Will the proposed new content be used to design and field one or more IEPDs?
- Does the new content duplicate components in NIEM Core or another Domain?
- Is the new content optimal for the MilOps Domain?
- Does the new content pertain to tenant doctrine and Policies that drive Military Operations?

3.5   Harmonization Guidelines

3.5.1 Harmonization Discovery

Data harmonization is a key function and handled collectively by the Domain Steward, CCB and LDM as applicable. Harmonization occurs continuously throughout the life-cycle of the MilOps data model. "Input" harmonization refers to harmonization actions on inputs to model updates.

This harmonization acts to prevent the initial introduction of semantic overlap in periodic releases. "Pre-release" harmonization refers to data overlaps discovered in the model but prior to final release. Overlaps are discovered in testing and targeted searches. Finally, "post-release" harmonization refers to data overlaps identified via bug reports, additional testing, or previously unresolved issues.

3.5.2 Harmonization Data Sources

Data sources for harmonization of NIEM releases are the NIEM Core and dependencies, Domain content, and Code Tables. A data source for domain update harmonization is the originating domain for the release. Data sources for IEPDs include the content of the participating domains or IEPD partners, and the NIEM Core as applicable. NCCT harmonization issues and the Harmonization Master List (HML) are also useful data sources.

3.5.3 Harmonization Steps

Harmonization within the data model maturity process requires collaborative governance between NIEM participating parties (e.g., domain users, stakeholders and IEPD developers) and their domain representatives. The NBAC and NIEM 'participating parties' work together to determine the most suitable option when semantic conflict or ambiguities occur around data components.
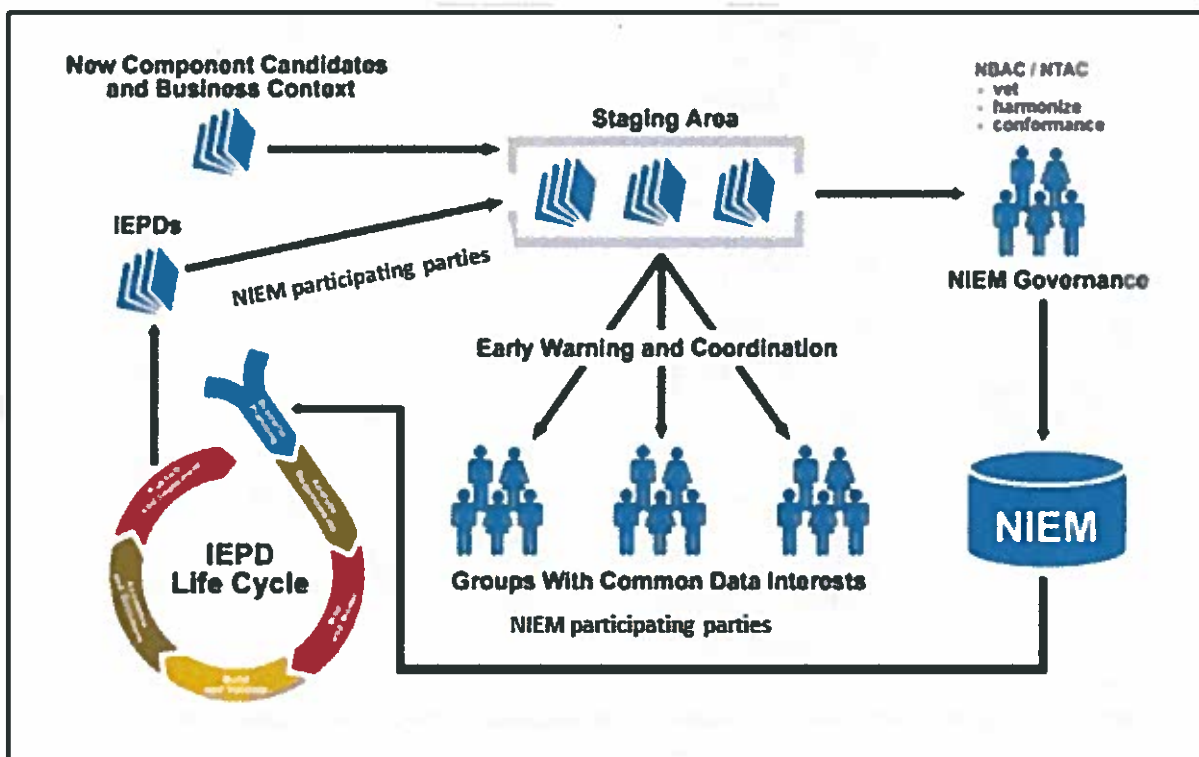

Figure 4: Harmonization Processes

4   MilOps Domain Stakeholder Guidance

An IEPD is an MPD that contains NIEM-conformant schemas that define one or more recurring XML data exchanges. IEPDs will be developed in accordance with NIEM Naming and Design Rules (NDR) and specific domains shall adhere to the DoD controlled data distribution restriction requirements.

The publication of completed IEPDs should be available for re-use in the associated IEPD search tools identified in the NIEM tools catalog (e.g., IEPD Clearinghouse) and the DoD Data Services Environment (DSE) online repositories for public and Mission Specific content respectively. IEPD developers that may require training and technical assistance should consult the NIEM web site primarily but may consult the domain CCB and/or representatives as appropriate.

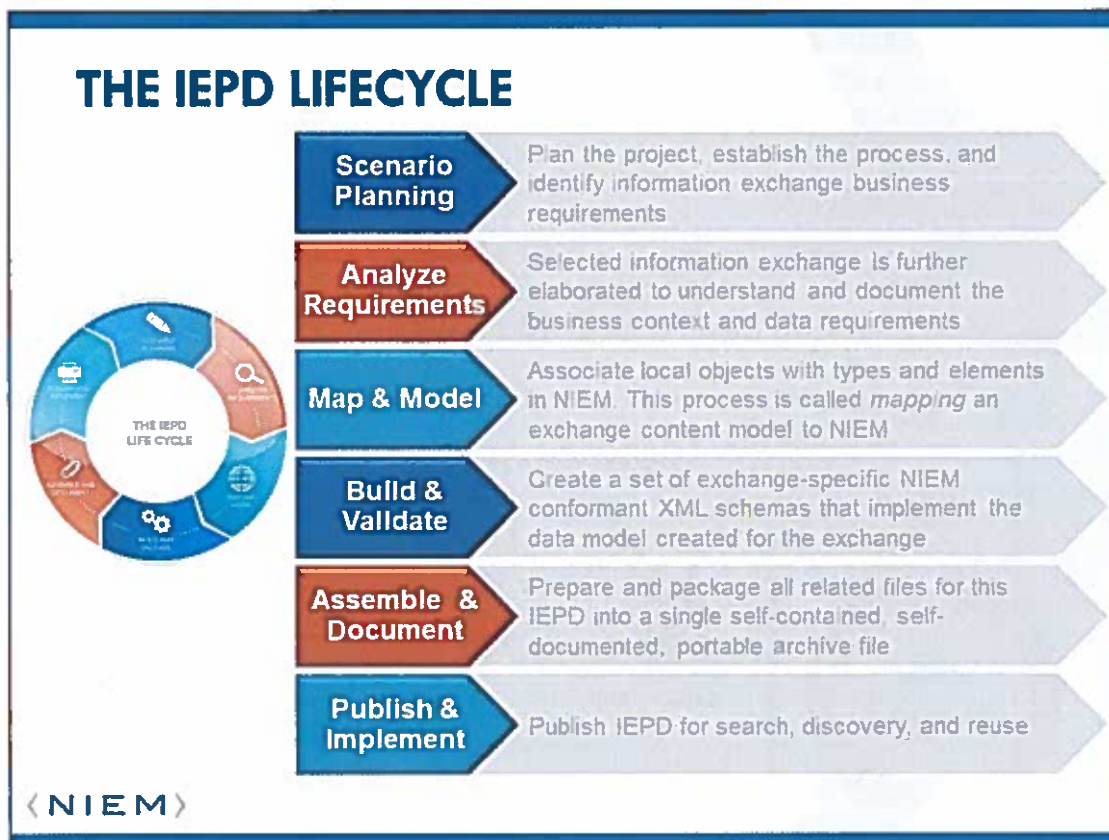The IEPD Development Process is depicted in Figure 5 Below:

Figure 5: IEPD Development Process

5 Assist Support

The CCB will provide assistance and information about NIEM and MilOps Domain procedures on issues raised by Domain users. The guiding principle of assistance is that problems should be addressed as close to the lowest level as possible. This assist capability is provided through the combined membership of the CCB as appropriate. This support is an interim solution until the overall DoD NIEM Technical Assistance Organization is established. The interim assistance procedure is depicted in figure 6.
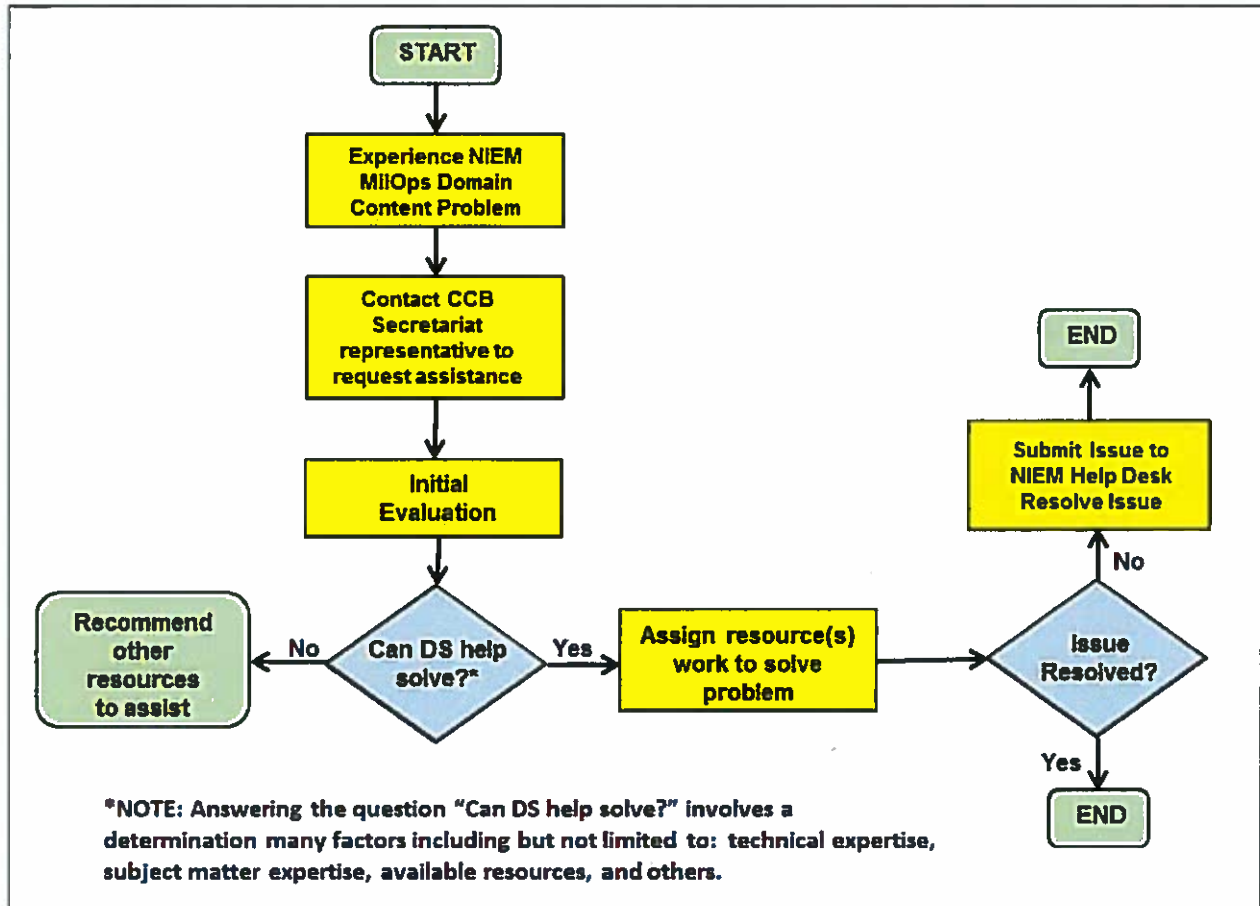

Figure 6: Interim Assistance Procedure

6 Training

NIEM training is available on the NIEM.gov website. Except for classroom, the training is free and provided in a variety of formats including online, classroom and webinars. The online training is available anytime on demand.

6.1 NIEM Training

Training is essential for understanding NIEM and necessary to support the successful adoption of NIEM. All NIEM users should complete the training course of instruction below as appropriate commensurate with their responsibilities.

User-based tracks, designed for both technical and non-technical audiences, comprehensively address NIEM and its domains. Courses ranging from the 100 to 300 level are tailored for each of four types – Executive Mangers, Program Managers, Architects, and Implementers. NIEM training information is available at: https://www.niem.gov/training/Pages/online.aspx.

6.2 NIEM Course Offerings

COURSE #	DESCRIPTION	TRAINING AUDIENCE
NIEM 100	Introduction to NIEM	EM, PM, SO
NIEM 101	Technical introduction to NIEM	ARCH, IMP
NIEM 200	Lifecycle for programs and projects	PM, SO
NIEM 300	IEPD discovery & development	ARCH, IMP
NIEM 301	Advance technical concepts	IMP
NIEM 302	IEPD construction and implementation	IMP
NIEM 303	IEPD publishing	PM, ARCH, IMP

(Notes: Optional course for architects: NIEM 200; optional course for program managers: NIEM 300)

6.3 Supplemental Information

Supplemental training materials and worked examples of NIEM implementations unique to DoD is expected to be developed over time. This material will be share via the MilOps Domain presence on the Data Services Environment (DSE) website located at URL: https://metadata.ces.mil/dse-help/en/milops.

7 Stakeholder Engagement

The stakeholder engagement processes described below will enable the MilOps domain to build a sense of community among stakeholders, engage stakeholders in domain activities, and solicit input.

7.1 Domain COI Scope

A NIEM domain is an aggregation of stakeholders into a COI (Community of Interest) that are aligned to the domain's mission space by affiliation, mission, or function. The MilOps Domain is an operational mission-focused vocabulary designed to provide multifunctional, cross-organizational data elements that DoD and non-DoD information exchange developers may use in creating NIEM-based information exchanges.

Various government COIs that may interact with the MilOps Domain are composed of representatives from multiple Federal, local, state and Tribal organizations. Although the mix of representatives may differ in each organization, Government COI's with specific mission interests in the MilOps Domain may include but not be limited to entities with the following common interests:

- Force Support: maintenance and management of a mission ready force
- Battle Space Awareness: dispositions and intentions as well as the characteristics and conditions of the operational environment that bear on national and military decision-making
- Force Application: maneuver and engagement in all environments to create the effects necessary to achieve mission objectives
- Logistics: support needed for the projection and sustainment a logistically ready force
- Command, Control, Communications, and Computers: authority and direction over forces and resources
- Protection: prevention / mitigation of adverse effects of attacks on personnel and physical assets

COI Stakeholder membership and involvement is recorded and tracked by the CCB as a Domain Metric per the MilOps Domain Charter.

7.2 Stakeholder Communications and Outreach

The Domain Steward is ultimately responsible for developing and maintaining the outreach/communications strategy, and identifying who is responsible for developing and distributing outreach materials. Per the MilOps Domain Charter the Domain Steward leads the following Outreach functions and assigns tasking as appropriate:

- Oversees coordination of MilOps Domain functions with DoD and non-DoD stakeholders, DoD governance entities, and NIEM PMO
- Provides leadership-level NIEM / MilOps perspective to DoD stakeholders regarding use / optimization of NIEM / MilOps Domain

7.3 Stakeholder Feedback Channel

Stakeholder feedback is provided through multiple channels, including:

- Feedback within domain governance structure (e.g., meetings, communications);
- Feedback through CR review / approval process;
- Feedback through IEPD development
- Feedback through cross-domain activities;
- Feedback through NIEM PMO governance processes.
- Online Feedback can be provided by selecting the category "NIEM 3.0 Feedback" through the following online form: https://www.niem.gov/Pages/contact.aspx.

Appendix 1: MilOps Domain Change Request

⟨ NIEM ⟩ milops	MilOps Domain Change Request Form

Instructions:
- Complete the fields in Section I of the form below as appropriate and send to the Configuration Control Board Secretariat [email: frank.w.klucznik.ctr@mail.mil]. Be sure to attach full description of proposed change.
- Do not use this form for changes to tools, technical specifications or training materials; rather send those change requests directly to technical architecture issues to Lynda Dallas, DoD Architect (lynda.b.dallas.civ@mail.mil).
- Section II will be completed by the CCB Secretariat.

SECTION I (Originator To Complete)	
Request Date (DD/MM/YY):	Agency Internal Reference Number:
Change Request Title:	
CR Sponsor :	
Originating Organization Name:	
Originating Organization Mailing Address:	
Point of Contact (name/title):	
POC Telephone:	
POC email address:	
Change Request Scope: ☐ Add New ☐ Modify Existing ☐ Admin/Typo ☐ Other _____	
Is this CR publicly releasable? ☐ Yes ☐ No If no, explain why:	

Attention Originating Organization: Describe the proposed change, including the recommendations (to include identification of paragraph(s)/sections(s) impacted and document markup where necessary), justification (including authoritative references), and associated impacts and risks. Change requests without full and clear description will be returned for rework before consideration.
Change Description [identify specific paragraph(s)/section(s) impacted and document markup where necessary, attaching additional sheet or file, if required]:
Change Justification [including supportive authoritative references]:
Impacts & Risks:
List Amplifying Attachments such as record filename and dates, schemas, code lists, COI test reports. etc.:

SECTION II	
(SECRETARTIAT to Complete)	
Change Request Number:	Agency Internal Reference Number:

Comments/Explanation:

Summary of Recommendations/Positions (to include governance body assessment):

Administrative Record of Processing:

Date:	Action (received, reviewed, disposition, implementation, other actions):
	CR received for administrative processing.

Disposition

☐ Approved   ☐ Disapproved   ☐ Conditional Approval   ☐ Referred to NBAC

Approving Official (name/signature):

Title: Date:

Form: V1.1, 01 May 2014

Appendix 2: New Member Information

The following information is provided for anyone who may be unfamiliar with NIEM and NIEM MilOps.

We recommend you begin by visiting the http://niem.gov and http://niem.gov/milops websites and review the online resources.

Afterward we strongly recommend you take the appropriate free online NIEM training available from: http://niem.gov/training. Training is organized by role (e.g., executive managers, project managers, architects, or developers) and available anytime.

NIEM technical documentation is available for download from: http://niem.gov/reference or http://reference.niem.gov/niem.

The NIEM tools are available on: http://niem.gov/tools.

NIEM release packages are available for download from: https://www.niem.gov/technical/Pages/current-release.aspx. The MilOps domain update is available for download from: http://publication.niem.gov/niem/domains/militaryOperations/3.0/1.

For Federal Government users (e.g., DoD, DoJ, DHS), the restricted reference model is available from the DoD Data Services Environment at: https://metadata.ces.mil/dse/dse_assets/100135658/SubmissionPackage.

Additional implementation guidance is available on Intellipedia at the following URLs: https://intellipedia.intelink.gov/wiki/NIEM and https://www.intelink.gov/go/gf3Dsgl.

Additional training and technical support for building NIEM conformant Information Exchange Package Documentation (IEPDs) is available upon request. Contact the MilOps Configuration Control Board Secretariat, frank.w.klucznik.ctr@mail.mil, to check resource availability and schedule an event.