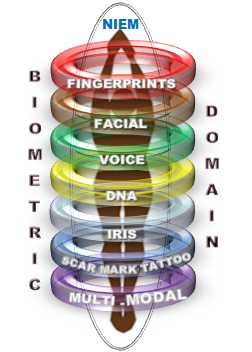


****

Boyd

Domain Management Plan

2 February 2018

**Draft**

Submitted by:

Integral Consulting Services, Inc.

2101 Gaither Road, Suite 410

Rockville, MD 20850

Contract Number: GS00Q14OADS145

Delivery Order Number: HSHQDC-17-F-00189

**Approval**

**DHS OBIM Signatures**

**Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mr. John Boyd Date**

**NIEM Biometrics Domain Chair**

**Assistant Director**

**Office of Biometric Identity Management**

**Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mr. Thomas Freed Date**

**Information Technology Specialist**

**Futures Identity**

**Office of Biometric Identity Management**

**Record of Changes**

| No. | Date | Reference: Page, Table, Figure, Paragraph | A = Add. M = Mod. D = Del. | Change Description |
| --- | --- | --- | --- | --- |
| 1 | 7-12-2018 | All | A | Initial version approval |
| 2 | 1-23-2019 | P ii | M | Updated Thomas Freed Title |

**Table of Contents**

[1 Introduction 1](#_Toc506460547)

[1.1 Overview 1](#_Toc506460548)

[1.2 Scope 1](#_Toc506460549)

[1.3 Audience 1](#_Toc506460550)

[2 Management and Operations of the Domain 2](#_Toc506460551)

[2.1 Operational Support 2](#_Toc506460552)

[2.2 Data Dictionary 3](#_Toc506460553)

[2.3 Component Mapping Template (CMT) 4](#_Toc506460554)

[2.4 NIEM Harmonization and Reconciliation 4](#_Toc506460555)

[2.5 Tier Two/Tier Three Technical Support and NIEM Technical Reporting 6](#_Toc506460556)

[3 Data Standards 6](#_Toc506460557)

[3.1 Data Requirements Identification 6](#_Toc506460558)

[3.2 External Data Standardization 7](#_Toc506460559)

[3.3 NIEM XML Schemas 7](#_Toc506460560)

[3.4 Naming and Design Rules 7](#_Toc506460561)

[4 References 8](#_Toc506460562)

[Appendix A Glossary of Abbreviations, Acronyms, and Initialisms 8](#_Toc506460563)

**List of Figures**

[Figure 1: Model Harmonization 4](#_Toc506150476)

# Introduction

## Overview

The Office of Biometric Identity Management (OBIM) serves as the lead entity for biometric identity management services within the U.S. Department of Homeland Security (DHS). OBIM provides enterprise-level biometric identity information to DHS and its mission partners. It operates and maintains the Automated Biometric Identification System (IDENT), and provides identity services expertise as a service provider for customers across the Department, at other Federal agencies, in state and local law enforcement, and overseas. OBIM is also focused on improving biometric sharing in support of national security and public safety. By matching, storing, sharing, and analyzing biometric data, OBIM provides partners on the front lines of homeland security with rapid, accurate, and secure identification.

The National Information Exchange Model (NIEM) Biometrics Domain is a partnership of the U.S. Department of Justice (DOJ) and DHS. It is designed to develop, disseminate, and support enterprise-wide information sharing standards and processes, providing a framework enabling communities of interest throughout the nation to collaborate and share critical information effectively. NIEM enables information sharing across all levels of government, including Federal, state, local, and tribal governments. OBIM, as the NIEM Biometrics Domain steward, is responsible for the domain's model content, governance, and maintenance.

## Scope

OBIM, in the stewardship role, is responsible for establishing a Biometrics Domain Management Plan for managing a common vocabulary of reusable and repeatable data terms, definitions, and processes to facilitate machine-readable information exchanges between communities of interest (COI).

The Biometrics Domain Management Plan describes the domain management activities. These include the creation and maintenance of a common data dictionary and component mapping templates (CMT) for the Biometrics Domain, participation in all NIEM harmonization and reconciliation activities, recommendations for external data standardization initiatives, identification of external data requirements, and technical support for domain-specific issues.

Domains work collaboratively to identify areas of overlapping interest, known as the harmonization process. As domain stakeholders develop and implement NIEM-based exchanges, they provide new or updated information exchange requirements to the domain steward, who takes the new contents and incorporates them into the NIEM domain. Content updates can happen at any time, and they are incorporated into the next NIEM release as they are received for reconciliation and official publication.

## Audience

This document’s intended audience comprises the NIEM biometrics community, which includes Federal, state, local, tribal, and private organizations, the NIEM Executive Steering Committee (ESC), the NIEM Program Management Office (PMO), the NIEM Business Architecture Committee (NBAC), the NIEM Technical Architecture Committee (NTAC), and the NIEM Communications and Outreach Committee (NC&OC).

# Management and Operations of the Domain

A *domain* refers to a business enterprise that broadly reflects the agencies, units of government, operational functions, services, and information systems which are organized or affiliated to meet common objectives. NIEM domains are organized to facilitate governance, and each has some measure of persistency. Each traditionally includes a cohesive group of data stewards who are SMEs, have some level of authority within the domains they represent, and participate in the processes related to harmonizing conflicts and resolving data component ambiguities.

Domains are expected to:

* Provide content to NIEM
* Provide domain subject matter expertise to support content development
* Have existing COIs or the ability to enroll or create representative and authoritative COIs
* Possess the ability to perform outreach to relevant COIs
* Support their own governance
* Participate in NIEM governance as appropriate
* Maintain strategic alignment within the scope of NIEM
* Agree to the principles and practices of NIEM (including conformance to NIEM Naming and Design Rules (NDR)
* Maintain alignment with the NIEM taxonomy
* Authoritatively support internal and external harmonization objectives.

## Operational Support

Domain stewardship includes providing day to day oversight of the Biometrics Domain. This includes all aspects of NIEM operational support and any software/hardware modifications for the Biometrics Domain in NIEM.Gov, including all planned and unplanned releases and upgrades. The Biometrics Domain also supports NIEM.gov by providing quarterly training with a “train the trainer” format to OBIM users and programmers on the domain.

The Biometrics Domain provides the support required to facilitate its own successful development, maintenance and testing as related to NIEM Exchange Messaging (IXM) and the IXM schema, ensuring that OBIM systems and applications are prepared to respond to data messaging or data interoperability standards developed for the domain. This includes NIEM conformance to IXM and recommendations for changes to IXM services and data structures to support OBIM interoperability and data sharing with national and international partners.

OBIM, through the Biometrics Domain stewardship, directly supported NIST in the 2013 and 2015 ANSI/NIST-ITL Standard updates. At present, OBIM participates in the NIST-sponsored ITL 2015 XML Working Group, which formally updates the existing ITL schemas to align with the new NIEM 4.1 release

The Biometrics Domain utilizes the Schema Subset Generation Tool (SSGT) for operational analysis and development support. This is the preferred tool to generate schema subsets from the NIEM data model without editing the model schema itself. All dependencies are automatically added to ensure that the resulting schema subset is valid. This tool is used to support the Information Exchange Package Documentation (IEPD) life cycle.

Additional operational support activities include:

* Participating in all required NIEM activities, including the monthly NBAC meeting, NIEM Face2Face, and tiger teams
* Ongoing outreach via the NIEM Biometrics Facilitator regarding major releases and events
* Facilitating NBAC Annual Report working sessions upon request
* Developing Biometric Domain COI communications related to the release of Biometric Domain NIEM incremental schemas, and highlighting the collaborative nature of National Institute of Standards and Technology (NIST), the NIEM Biometrics Domain (NBD), and OBIM
* Supporting NIEM PMO/NBAC requests to review NBAC face-to-face agendas
* Monitoring of the NIEM Biometrics Facilitator account.

## Data Dictionary

The NIEM Biometrics Common Data Dictionary is a repository of concepts based on the methodology and the information model. It is used to search and identify specific terminology for constructing schemas for IEPDs, and during the data harmonization process when the NBAC and NTAC are reviewing COI proposal packages for integration of data components into NIEM. The NIEM Biometrics Common Data Dictionary is updated with each release of NIEM, and is most often used in the Map and Model phase of the IEPD life cycle. It provides:

* Unambiguous identification of classes and properties, and their relations
* Commonly accepted terminology and definitions based on accepted sources; i.e., ITL/ American National Standards Institute (ANSI) standards
* Hierarchies of concepts enabling users to characterize their data appropriately
* Relevant conditions and constraints on possible values of characteristics
* Technical representations of concepts, units and data types, and their identification
* Standard definitions of data elements, their meanings, and allowable values
* Details about each attribute of a business concept.

As part of the domain management support, periodic updates will be made to data dictionaries, including the NIEM Biometrics Domain Common Data Dictionary and the IXM Data Dictionary. Some of the activities that would likely require modifications to the data dictionaries are:

* NIEM incremental releases put forth by the ITL XML working group
* New biometric modality type inclusions adhering to the ITL standard
* Resolution of schema alignment issues related to updated code lists
* IXM review and alignment
* Review of IXM schema and identification of elements for possible inclusion in NIEM
* Review of the IXM Technical Specification Update to ensure the service catalog, capability, schema, technical specification, and NIEM IEPDs are updated when additions or revisions are made to the IXM schema.

## Component Mapping Template (CMT)

The CMT is a workbook 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 currently resident in NIEM. It identifies and characterizes similarities and differences between NIEM and the COIs’ data component requirements, and facilitates conformity to the NIEM NDR. The data component mapping is one artifact required for an IEPD, and used in the Map and Model phase of the IEPD life cycle. The CMT may be used as templates or structures for defining the biometric-related specific data collections for various applications such as catalogues, databases, and master data repositories. Such consistent data collections are indispensable for data integrity and efficient management of domain data, including data sharing.

A responsibility of domain management is to develop and update the CMT for the Biometrics Domain, which conforms to the NIEM NDR maintained by the NIEM PMO and available through www.NIEM.gov.

## NIEM Harmonization and Reconciliation

NIEM Data Harmonization is a process for modeling, adding, and integrating new data components in ways that minimize differences, remove duplication, resolve conflicts, reduce the degree of variation, and achieve consistency across all existing components. Harmonization seeks to bring new content into NIEM, while reestablishing or maintaining standardization and uniformity across all parts of the data model under the NDR.

Harmonization ensures that changes to NIEM preserve or improve the model’s internal consistency and integrity in that:

* NIEM represents each business concept in one and only one place in the model
* Each component represents a single concept with a clear, unambiguous definition
* The use of associations, specializations, roles, and augmentations is applied consistently and uniformly across components
* It is an iterative process with constant improvement in the model’s integrity, improving the model’s usability for IEPD designers by reducing ambiguity, imprecision, and duplication, while allowing NIEM to scale upwards by providing an orderly and disciplined process for incorporating new content.

As shown in **Figure 1: Model Harmonization**, harmonization within the data model maturity process requires collaborative governance between NIEM participating parties and the NBAC. The NBAC and NIEM participating parties work together to determine the most suitable option when semantic conflict or ambiguity occurs around a data component.

C:\Users\kamster\Documents\new during backup\model harmonization.tiff

Figure 1: Model Harmonization

The Biometrics Domain Management team participates in the NBAC meetings and supports domain reconciliation and cross-domain harmonization, resulting in future NIEM releases (both major and minor) as needed.

Specific harmonization activities may include:

* Supporting the DoD EBTS Development Team with ongoing NIEM alignment analysis
* Participating in the ANSI/NIST-ITL Working Group to refine ITL schema with major stakeholder requirements
* Providing technical assistance relating to requests by the Information Sharing and Services Office (IS2O)
* Participating in the ANSI/NIST-ITL Working Group to refine ITL schema with major stakeholder requirements
* Updating the DoD EBTS Code List changes if they impact the NBD schema relative to planned updates for ITL code list revision alignment
* Conducting final review on the NBD schema package for submission to the Georgia Tech Research Institute (GTRI) for required pre-release validation
* Updating the GTRI with new issues for code list resolution prior to submission of new schema packages
* Participating in architecture team collaboration meetings to facilitate integration of NIEM support functions into current and future architectures
* Performing schema package validation utilizing the Conformance Testing Assistant (ConTesA)
* Engaging with the OBIM Architecture Team to review ongoing alignment exercises in the context of coordinated IXM releases of NBD schema.

## Tier Two/Tier Three Technical Support and NIEM Technical Reporting

The Biometrics Domain provides Tier Two and Tier Three technical support to assist implementers and developers for domain-specific issues related to NIEM and IEPD development. They report on NIEM technical issues using the Issues Tracking Tool, the NIEM Configuration Control Tool (NCCT) provided by the NIEM PMO, and the NIEM helpdesk. NCCT is the primary tool used for inserting and tracking technical and business issues with the NIEM data model, and helps the PMO in prioritizing input from the stakeholder community.

The Biometrics Domain submits all formal comments regarding technical or policy issues with its domain through NCCT for resolution tracking and auditing. Use of the NCCT provides clear traceability and accountability for change management of NIEM data components and associated releases through the governance processes.

# Data Standards

NIEM adopts standard XML schema constructs and methods, including roles, associations, and augmentation from industry standards such as the World Wide Web Consortium (W3C) XML Schema language. The data standards reference and import features save time and effort in dealing with existing standard and legacy data by enabling use of data components from an external standard schema or namespaces, even though they do not conform to the NIEM NDR.

The domain stewardship includes a role in the NIEM Standards Body, and supports DHS’ focus on participating in domestic and international standardization. Its role includes coordinating and facilitating standards development for the NBD, based on business context and coordinating and facilitating the development of Information Exchange Package Documentation.

## Data Requirements Identification

The Biometrics Domain needs to identify critical data requirements to identify new data resources. Identification of internal and external data requirements is crucial for sharing information, helping to identify and develop simple scenarios and, within those scenarios, identifying common use cases for sharing information. It also helps to examine existing database schemes, data dictionaries, XML schemas, flat files, paper and electronic forms, workflows, etc. for data requirements. Such data sources can provide insight into what data is currently shared, and how.

Many variants of data names and definitions probably exist already in the sources. To create a good domain model and eliminate duplication, it is necessary to first harmonize; i.e., decide on a single name, definition, and structure type for each data element. Second, map the data model elements and types back to their authoritative sources, such as data dictionaries, database schemes, forms, etc., and record this mapping for reference. This mapping will likely become a critical resource to programmers, who will implement information exchanges with the domain model and may have to trace back to the legacy data sources.

As steward of the Biometrics Domain, OBIM is responsible for supporting new data initiatives within the COIs and working groups, and for providing analysis to identify new data requirements based on exchange/data modeling and development efforts.

## External Data Standardization

External data standards are with a governing body outside the scope of NIEM whose products must be used in conjunction with NIEM in exchanges. It is possible to adapt existing external non-NIEM namespaces for use in the NIEM framework, allowing the use of external standards within NIEM IEPDs, without requiring that the external standards themselves be NIEM-conformant.

External standards are adapted by wrapping the non-conformant XML Schema types and elements in NIEM-conformant components, maintained in a NIEM-conformant schema. These wrapper components effectively shadow as much, or as little, of the external standard as deemed appropriate, depending on how the wrapper components are designed. This allows the use of the standard within the NIEM framework at any granularity, while preserving the semantics and original structure of the external standard.

Incorporation of external data components into the NIEM core or NIEM domains requires review and approval by the NBAC and NTAC. The Biometrics Domain provides recommendations for incorporating related external data standardization initiatives as appropriate.

## NIEM XML Schemas

NIEM Biometrics Domain stakeholders and members actively participate in developing the biometrics schema. This schema is aligned with existing and emerging biometrics standards as put forth by the NIST, including the ANSI/NIST-ITL Standard and Supplemental Updates which may include new modalities.

NIEM XML Schemas express shared vocabularies, and allow systems to follow precise business rules. They define and dictate what content is permitted in an NIEM XML document so systems can automatically determine, via validation, whether the contents are acceptable and in proper order and relationship. The NIEM XML reference schemas are a set of interrelated schemas which define NIEM data components. In general, domain reference schemas import schemas from the NIEM core. The NIEM XML reference schema set represents one release of the full set of data components in NIEM, and is available for use by all NIEM IEPDs.

The Biometrics Domain provides support to the COI to vet, facilitate, and authorize the NIEM XML biometric schema in coordination with the NIST Biometrics Working Group and ANSI/NIST- ITL XML Working Group (ANXMKWG). This support also includes facilitation of NIEM standards during development, maintenance, and testing within the Biometrics Domain as related to NIEM XML and IXM schemas.

## Naming and Design Rules

NIEM Naming and Design Rules (NDR) specifies rules to standardize biometric schema development and provide a blueprint for NIEM conformance. It also provides rules for NIEM reference schemas, NIEM Extensible Markup Language (XML) elements, and other NIEM XML documents, including sample XML instances. The NIEM NDR consists primarily of principles providing guidelines, which may be the basis for enforceable rules and normative rules.

The NIEM NDR is based on published and established standards, including standard specifications from public standards organizations, specifications from government bodies, preexisting data systems, de facto standards, and common usages by the community. NIEM, through NDR, aligns with the standards of the World Wide Web Consortium and the International Organization for Standardization.

In cooperation with the domain executive management team and associated committees, the Biometrics Domain will support the NIEM PMO relative to the NDR. Stewardship includes supporting the Biometrics Domain to ensure NIEM architecture and constructs are NDR conformant.

# References

* Establishing Domain Governance: https://www.niem.gov/communities/domain-governance NIEM High Level Version Architecture (HLVA), Version 3.0. Available at: https://reference.niem.gov/niem/specification/high-level-version-architecture/3.0//
* NIEM Domain Update Specification, Version 1.0. Available at: http://reference.niem.gov/niem/specification/domain-update/1.0/
* NIEM Model Package Description (MPD) Specification, Version 3.0.1. Available at: https://reference.niem.gov/niem/specification/model-package-description/3.0.1/
* NIEM Naming and Design Rules (NDR), Version 4.0. Available at: https://reference.niem.gov/niem/specification/naming-and-design-rules/4.0/
* NIEM Conformance, Version 3.0. Available at: https://reference.niem.gov/niem/specification/conformance/3.0/

##### Glossary of Abbreviations, Acronyms, and Initialisms

|  |  |
| --- | --- |
|  |  |
| ANSI | American National Standards Institute |
| ANXMKWG | ANSI/NIST- ITL XML Working Group |
| CMT | Component Mapping Templates |
| COI | Community of Interest |
| ConTesA | Conformance Testing Assistant |
| DHS | Department of Homeland Security |
| DoD | Department of Defense |
| DOJ | Department of Justice |
| ESC | Executive Steering Committee |
| GTRI | Georgia Tech Research Institute |
| HLVA | High Level Version Architecture |
| IDENT | Automated Biometric Identification System |
| IEPD | Information Exchange Package Documentation |
| IS2O | Information Sharing and Services Office |
| ITL | International Technology Laboratory |
| IXM | Exchange Messaging |
| MPD | Model Package Description |
| NBAC | NIEM Business Architecture Committee |
| NBD | NIEM Biometrics Domain |
| NC&OC | NIEM Communications and Outreach Committee |
| NCCT | NIEM Configuration Control Tool |
| NDR | Naming and Design Rules |
| NIEM | National Information Exchange Model |
| NIST | National Institute of Standards and Technology |
| NPPD | National Protection and Programs Directorate |
| NTAC | NIEM Technical Architecture Committee |
| OBIM | Office of Biometric Identity Management |
| PMO | [NIEM] Program Management Office |
| SSGT | Schema Subset Generation Tool |
| W3C | World Wide Web Consortium |
| XML | Extensible Markup Language |
| XSD | XML Schema Definition |