



# **Intelligence Community Technical Specification**

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## **XML Data Encoding Specification for Intelligence Publications**

### **Version 2016-SEP**

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# Table of Contents

Chapter 1 - Introduction .....	1
1.1 - Purpose .....	1
1.2 - Scope .....	1
1.3 - Background .....	1
1.4 - Enterprise Need .....	2
1.5 - Audience and Applicability .....	3
1.6 - Conventions .....	3
1.6.1 - Language .....	3
1.6.2 - Typography .....	3
1.6.3 - Terminology .....	4
1.6.4 - XML Namespaces .....	4
1.7 - Dependencies .....	4
1.7.1 - Standalone and Convenience Packages .....	7
1.8 - Conformance .....	8
1.9 - Version Policies .....	8
1.9.1 - XML Namespace Policy .....	8
1.9.2 - Version Numbering .....	9
Chapter 2 - Development Guidance .....	10
2.1 - Relationship to Abstract Data Definition and other encodings .....	10
2.2 - Additional guidance .....	10
2.2.1 - Publications Metadata Usage .....	10
2.2.2 - Use of IC Resource Metadata Package .....	11
2.2.3 - Specification of publishing organization .....	11
2.2.4 - Specification of Need-To-Know Access Parameters .....	11
2.2.5 - Specification of Production Metrics Reporting Metadata .....	11
2.2.6 - Specification of IntelDocMetadata .....	12
2.2.7 - Specification of PublicationMetadata .....	12
2.2.8 - Specification of Notes and Security Notices .....	12
2.2.8.1 - Point Of Contact Requirements .....	12
2.2.9 - Specification of Approximable dates .....	13
2.2.9.1 - Date String .....	13
2.2.9.2 - Single ISO 8601 Format Date .....	13
2.2.9.3 - Date Pair .....	14
2.2.10 - Approximate Dates in Constraint Rules .....	14
2.2.11 - MIME Type .....	15
2.2.12 - Specification of Source Citations .....	15
Chapter 3 - Definitions, Interfaces, and Constraints .....	16
3.1 - Constraint Rule Types .....	16
3.2 - "Living" Constraint Rules .....	16
3.3 - Classified or Controlled Constraint Rules .....	16
3.4 - Constraint Terminology .....	16
3.5 - Errors and Warnings .....	17
3.6 - Rule Identifiers .....	17
3.7 - Data Validation Constraint Rules .....	17
3.7.1 - Purpose .....	17
3.7.2 - Schematron .....	18

3.7.3 - Non-null Constraints .....	18
3.7.4 - Inherited Constraints .....	18
3.7.5 - Value Enumeration Constraints .....	19
3.7.6 - Additional Constraints .....	19
3.7.6.1 - DES Constraints .....	19
3.7.7 - Constraint Rules .....	19
3.7.8 - Dates and Times .....	19
3.7.9 - Time Zone Indicators .....	21
3.7.10 - Information Security Markings (ISM.XML <sup>[26]</sup> ) .....	22
3.8 - Data Rendering Constraint Rules .....	22
3.8.1 - Purpose .....	22
3.8.2 - Rendering Constraint Rules .....	22
Chapter 4 - Conformance Validation .....	23
4.1 - Schema Validation .....	23
4.2 - Business Rule Validation .....	23
Chapter 5 - Generated Guides .....	24
5.1 - Schema Guide .....	24
5.2 - Schematron Guide .....	25
Appendix A - Feature Summary .....	26
A.1 - PUBS Feature Summary .....	27
Appendix B - Change History .....	29
B.1 - V2016-SEP Change Summary .....	29
B.2 - V2015-AUG Change Summary .....	31
B.3 - V2014-DEC Change Summary .....	33
B.4 - V12 Change Summary .....	34
B.5 - V11 Change Summary .....	35
B.6 - V10 Change Summary .....	39
B.7 - V9 Change Summary .....	44
B.8 - V8 Change Summary .....	46
B.9 - V7 Change Summary .....	47
B.10 - V6 Change Summary .....	50
B.11 - V5 Change Summary .....	52
B.12 - V4 Change Summary .....	54
B.13 - V3 Change Summary .....	56
B.14 - V2 Change Summary .....	57
Appendix C - List of Abbreviations .....	60
Appendix D - Bibliography .....	63
Appendix E - Points of Contact .....	69
Appendix F - IC CIO Approval Memo .....	70

List of Figures

Figure 1 - Related Specifications ..... 7

Figure 2 - Diagram of PUBS Structure ..... 11

## List of Tables

Table 1 - XML Namepaces .....	4
Table 2 - Dependencies .....	5
Table 3 - Numerical Rule Identifier Ranges .....	17
Table 4 - Date/Time-Related Data Types and Layout Representations .....	20
Table 5 - Constraint Rules .....	22
Table 6 - PUBS Dependency over Time .....	26
Table 7 - Feature Summary Legend .....	26
Table 8 - PUBS Feature Comparison .....	27
Table 9 - DES Version Identifier History .....	29
Table 10 - Data Encoding Specification V2016-SEP Change Summary .....	30
Table 11 - Data Encoding Specification V2015-AUG Change Summary .....	32
Table 12 - Data Encoding Specification V2014-DEC Change Summary .....	34
Table 13 - Data Encoding Specification V12 Change Summary .....	34
Table 14 - Data Encoding Specification V11 Change Summary .....	35
Table 15 - Data Encoding Specification V10 Change Summary .....	40
Table 16 - Data Encoding Specification V9 Change Summary .....	45
Table 17 - Data Encoding Specification V8 Change Summary .....	46
Table 18 - Data Encoding Specification V7 Change Summary .....	47
Table 19 - Data Encoding Specification V6 Change Summary .....	50
Table 20 - Data Encoding Specification V5 Change Summary .....	53
Table 21 - Data Encoding Specification V4 Change Summary .....	54
Table 22 - Data Encoding Specification V3 Change Summary .....	56
Table 23 - Data Encoding Specification V2 Change Summary .....	57

## Chapter 1 - Introduction

### 1.1 - Purpose

This *XML Data Encoding Specification for Intelligence Publications* (PUBS.XML) defines detailed implementation guidance for using Extensible Markup Language (XML) to encode publications data. This Data Encoding Specification (DES) defines the XML elements and attributes, associated structures and relationships, mandatory and cardinality requirements, and permissible values for representing publications data concepts using XML. This Data Encoding Specification (DES) also defines how to properly structure a valid instance of Trusted Data Format (TDF) that would conform with this specification. Use of TDF is required for compliance with this DES. A TDF may conform with multiple DES simultaneously assuming none of the criterion are in conflict.

### 1.2 - Scope

This specification is applicable to the Intelligence Community (IC) and information produced by, stored, or shared within the IC. This DES may have relevance outside the scope of intelligence; however, prior to applying outside of this defined scope, the DES should be closely scrutinized and differences separately documented and assessed for applicability.

### 1.3 - Background

The Intelligence Community Chief Information Officer (IC CIO) is leading the IC's enterprise transformation to an "interoperable federated architecture." Intelligence Community Directive (ICD) 500, *Director of National Intelligence Chief Information Officer* <sup>[16]</sup> grants the IC CIO the authority and responsibility to:

- Develop an Intelligence Community Enterprise Architecture (IC EA).
- Lead the IC's identification, selection, development, and management of IC enterprise standards.
- Incorporate technically sound, de-conflicted, interoperable enterprise standards into the IC EA.
- Certify that IC elements adhere to the architecture and standards.

In the area of enterprise standardization, the IC CIO is called upon to establish common Information Technology (IT) standards, protocols, and interfaces, to establish uniform information security standards, and to ensure information technology infrastructure, enterprise architecture, systems, standards, protocols, and interfaces support the overall information sharing strategies and policies of the IC as established in relevant law, policy, and directives.

Enterprise standards facilitate the information exchanges, service protocols, network configurations, computing environments, and business processes necessary for a service-enabled federated enterprise. As the enterprise develops and deploys shared services employing approved standards, not only will information and services be interoperable, but significant efficiencies and savings will be achieved by promoting capability reuse. As detailed in Intelligence Community Standard (ICS) 500-21, *Tagging of Intelligence and Intelligence-Related Information* <sup>[22]</sup> the extensive and consistent use of Extensible Markup Language (XML) within data encoding specifications allows for improved data exchanges and processing of information, thereby facilitating achievement of the IC's data discovery, data sharing, and interoperability goals.

An encoding specification defines a concrete implementation – a file format for example – for concepts in the *IC Abstract Data Definition* [2]. Many IC encoding specifications are based on XML, but other technologies are possible. For example, IC-ID[11] defines a plain-text format for IC Identifiers as well as an associated XML structure.

## 1.4 - Enterprise Need

This DES is designed to fulfill a number of requirements in support of the transformational efforts of the Intelligence Community (IC). These requirements include:

- Improving publication and dissemination efficiency by reducing the cost and time for performing manual and complex rendering, manipulation, and content transformation of information resource metadata in context of an intelligence publication.
- Facilitating discovery and exchange of content consisting of mostly text supplemented by interspersed non-textual content (i.e., multi-media) information between collectors, all-source analysts, and consumers.
- Capturing an intelligence publication's overall security marking metadata in order to support attribute and clearance-based information management practices, such as secure collaboration, content management, content and portion-level filtering of discovery results, and content transfers across security domains.
- Capturing source reference citations to provide intelligence collectors the ability to systematically analyze how and how often the data they gather or produce is being used in order to facilitate better management of collection and production resources.
- Capturing source reference citations to enhance the analytic integrity of formally disseminated intelligence information and improving the traceability of collected information to analytic judgments and conclusions.
- Capturing and retaining a greater understanding of an intelligence publication's meaning, purpose, genesis, and characteristics as identified by a human or service.

Enterprise needs and requirements for this specification can be found in the following Office of the Director of National Intelligence (ODNI) policies and implementation guidance:

- IC Information Technology Enterprise (IC ITE):
  - Intelligence Community Information Technology Enterprise (IC ITE) Increment 1 Implementation Plan[9]
- 500 Series:
  - Intelligence Community Directive (ICD) 500, Director Of National Intelligence Chief Information Officer[16]
  - Intelligence Community Directive (ICD) 501, Discovery and Dissemination or Retrieval of Information within the IC[17]
  - Intelligence Community Standard (ICS) 500-21, Tagging of Intelligence and Intelligence-Related Information[22]
- 200 Series:
  - Intelligence Community Directive (ICD) 206, Sourcing Requirements for Disseminated Analytic Products[13]



- Intelligence Community Directive (ICD) 208, Write for Maximum Utility<sup>[14]</sup>
- Intelligence Community Directive (ICD) 209, Tearline Production and Dissemination<sup>[15]</sup>
- Intelligence Community Policy Memorandum (ICPM) 2007-200-2, Preparing Intelligence to Meet the Intelligence Community's Responsibility to Provide<sup>[20]</sup>

## 1.5 - Audience and Applicability

This is a data encoding specification. It defines the structure and related business rules for encoding the described data type. A DES is intended for those developing tools and services that create, modify, store, exchange, search, display, or further process the type of data being described.

The governance of this specification and the data it describes, including any requirement to use this specification or prohibition thereof, is explicitly outside the scope of this specification. IC Standard (ICS) 500-20, *Intelligence Community Enterprise Standards Compliance*,<sup>[21]</sup> defines the IC Enterprise Standards Baseline (IC ESB) and the applicability of such to an IC element. *Department of Defense Instruction (DODI) 8310.01, Information Technology Standards in the DoD*,<sup>[6]</sup> requires DoD elements to use the DoD IT Standards Registry (DISR).

Use of this specification must be consistent with applicable Federal statutes, Executive Orders, Presidential Directives, Attorney General approved guidelines, IC Policy, IC element policies, established concepts of operation, agreements, contractual obligations, etc. However, the determination of any such requirements or restrictions is the sole responsibility of each implementing entity. Implementers may wish to consult the Office of General Counsel for their cognizant agency to determine existing requirements and restrictions for the use of this DES and to determine if new agreements or policy changes are required related to the use of this DES.

## 1.6 - Conventions

Certain technical and presentation conventions were used in the creation of this document to ensure readability and understanding.

### 1.6.1 - Language

When appearing in all capital letters in this technical specification, the keywords "MUST," "MUST NOT," "REQUIRED," "SHALL," "SHALL NOT," "SHOULD," "SHOULD NOT," "RECOMMENDED," "MAY," and "OPTIONAL" are to be interpreted as described in IETF RFC 2119, "Key words for use in RFCs to Indicate Requirement Levels."<sup>[23]</sup> When these words appear in regular case, they are meant in their natural-language sense.

### 1.6.2 - Typography

Certain typography is used throughout the body of this document to convey certain meanings, in particular:

- *Italics* – A title of a referenced work or a specialized or emphasized term
- Underscore – An abstract data element
- **Bold** – An XML element or attribute

## 1.6.3 - Terminology

For an implementation to conform to this specification, it **MUST** adhere to all normative aspects of the specification. For the purposes of this document, normative and informative are defined as:

- *Normative*: considered to be prescriptive and necessary to conform to the standard.
- *Informative*: serving to instruct, enlighten or inform.

## 1.6.4 - XML Namespaces

Namespaces referenced in this document and the prefixes used to represent them are listed in the following table. The namespace prefix of any XML Qualified Name used in any example in this document should be interpreted using the information below.

**Table 1 - XML Namespaces**

Prefix	URI
ddms	urn:us:mil:ces:metadata:ddms:5
irm	urn:us:gov:ic:irm
ism	urn:us:gov:ic:ism
pubs	urn:us:gov:ic:pubs
rr	urn:us:gov:ic:revrecall
src	urn:us:gov:ic:src
tdf	urn:us:gov:ic:tdf
xsd	http://www.w3.org/2001/XMLSchema

## 1.7 - Dependencies

This technical specification directly depends on the technical specifications, documentation, and implementations listed in [Table 2](#). The dependencies listed below are directly referenced in this specification (e.g. Schema, Schematron), and are normative or informative as indicated.

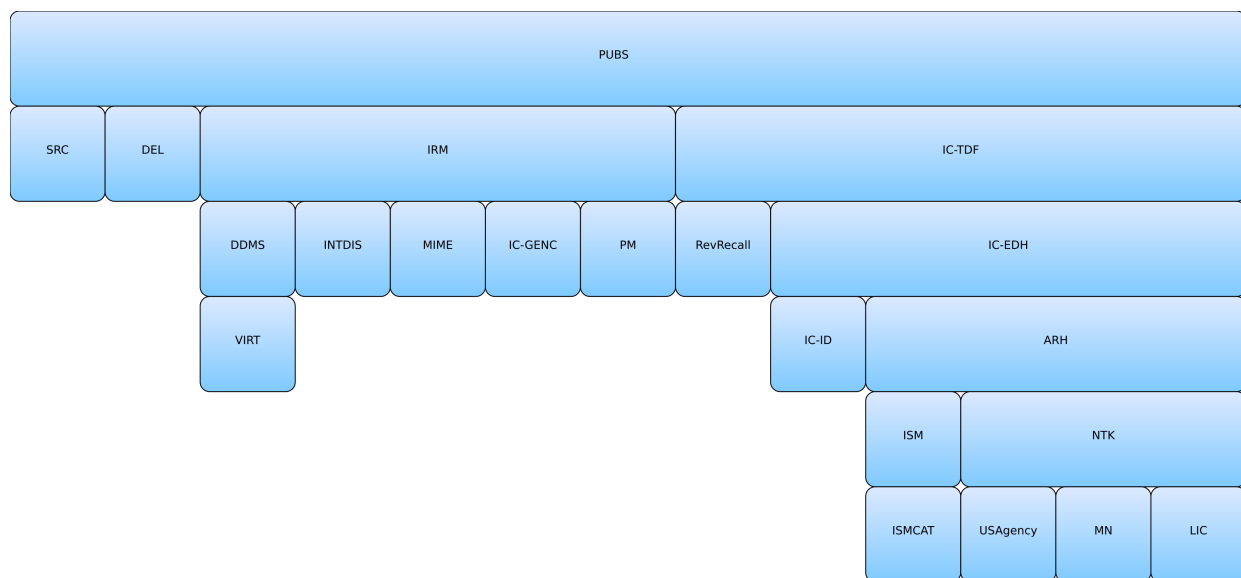
The subsequent figure, [Figure 1](#), is an informative graphical representation of all of the IC CIO specifications related to this specification. The graphic depicts direct and transitive dependencies. However, the representations may not match an exact schema import tree or dependency diagram that an analysis of the Schema, Schematron or other documents would yield. For example, the graphic only shows a given specification once even though it may actually be imported by many specifications or be a direct dependency. All specifications listed in [Table 2](#) will be shown in [Figure 1](#); however not all specifications listed in [Figure 1](#) may appear in [Table 2](#). [Figure 1](#) is to aid users in gaining a general understanding of all transitive dependencies.

**Table 2 - Dependencies**

Name	Dependency Description
“XML Data Encoding Specification for Information Security Marking Metadata” (ISM.XML.V13+) <sup>[26]</sup>	This specification does not depend on a specific version of Information Security Marking (ISM.XML); ISM.XML versions later than version 13 MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>XML Data Encoding Specification for Information Resource Metadata</i> (IRM.XML.V12+) <sup>[25]</sup>	This specification does not depend on a specific version of Information Resource Metadata (IRM.XML); IRM.XML versions later than version 12 MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>XML Data Encoding Specification for Source Citations</i> (SRC.XML.V2015-AUG+) <sup>[41]</sup>	This specification does not depend on a specific version of Source Citations (SRC.XML); SRC.XML versions later than version 2015-AUG MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>CVE Encoding Specification for Intelligence Discipline</i> (INTDIS.CES.V2015-AUG+) <sup>[24]</sup>	This specification does not depend on a specific version of Intelligence Discipline (INTDIS.CES); INTDIS.CES versions later than version 2015-AUG MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>CVE Encoding Specification for Media Type</i> (MIME.CES.V2016-SEP+) <sup>[36]</sup>	This specification does not depend on a specific version of Media Type (MIME.CES); MIME.CES versions later than version 2016-SEP MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>XML Data Encoding Specification for Trusted Data Format</i> (IC-TDF.XML.V3+) <sup>[12]</sup>	PUBS.XML elements as well as its dependent specifications are used in conjunction with IC-TDF objects as structured assertions or content that compose the necessary material represented by PUBS.XML. The dependence of PUBS.XML on IC-TDF is normative. The dependence of PUBS.XML on IC-TDF is normative. This specification does not depend on a specific version of Trusted Data Format (IC-TDF.XML); IC-TDF.XML versions later than version 3 MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.

Name	Dependency Description
<i>CVE Encoding Specification for ISM Country Codes and Tetragraphs</i> (ISM.CAT.CES.V2015-MAY+) <sup>[27]</sup>	This specification does not depend on a specific version of ISM Country Codes and Tetragraphs (ISM.CAT.CES); ISM.CAT.CES versions later than version 2015-MAY MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>XML Data Encoding Specification for Enterprise Data Header</i> (IC-EDH.XML.V4+) <sup>[10]</sup>	This specification does not depend on a specific version of Enterprise Data Header (IC-EDH.XML); IC-EDH.XML versions later than version 4 MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>XML Data Encoding Specification for Virtual Coverage</i> (VIRT.XML.V1+) <sup>[43]</sup>	This specification does not depend on a specific version of Virtual Coverage (VIRT.XML); VIRT.XML versions later than version 1 MAY be used. The minimum version was based on the earliest non-retired version; ESB 16-1 was used for determining the version.
<i>Department of Defense Discovery Metadata Specification</i> (DDMS v5) <sup>[4]</sup>	Depends on DoD Discovery Metadata Specification (DDMS). The dependence on DDMS is normative.
International Organization for Standardization (ISO) 639-1: <sup>[28]</sup> Codes for the representation of names of languages – Part 1: Alpha-2 code.	Depends on ISO 639-1. This dependency is normative.
International Organization for Standardization (ISO) 639-2: <sup>[29]</sup> Codes for the representation of names of languages – Part 1: Alpha-3 code.	Depends on ISO 639-2. This dependency is normative.
International Organization for Standardization (ISO) 639-3: <sup>[30]</sup> Codes for the representation of names of languages – Part 3: Alpha-3 code for comprehensive coverage of languages.	Depends on ISO 639-3. This dependency is normative.
International Organization for Standardization (ISO) 4217: <sup>[32]</sup> Codes for the representation of currencies and funds.	Depends on ISO 4217. This dependency is normative.

Name	Dependency Description
<p>XSLT 2.0<sup>[49]</sup> implementation of Schematron<sup>[40]</sup> by Rick Jelliffe (2010-04-14)</p> <p>Note: The only available identifying descriptors for this implementation are the implementer's name and date of release. This implementation may be found at the following URL: <a href="http://code.google.com/p/schematron/">http://code.google.com/p/schematron/</a>.</p>	<p>The International Organization for Standardization does not create nor endorse reference implementations of its standards. For the purposes of this specification the <i>behavior</i> of the implementation created by Mr. Jelliffe is normative.</p> <p>Implementers MAY use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. To conform to this specification, a validator <b>MUST</b> find a document valid <i>if and only if</i> the Schematron implementation by Mr. Jelliffe would find the document valid according to the Schematron rules in this specification.</p>
<p>Value enumerations used for several XML structures are defined in the various Controlled Vocabulary Enumerations (CVE) included in this DES.</p>	<p>Specification uses CVEs to encode controlled vocabularies. The use of the PUBS CVE is normative.</p>



**Figure 1 : Related Specifications**

### 1.7.1 - Standalone and Convenience Packages

The standalone package of this specification does not include the specifications that it is dependent on since there may be more recent versions of those specifications available. There is a convenience package of the specification that includes the most recent versions of all transitive dependent specifications at the time the package is generated. It is anticipated that this convenience package will be updated when any of the dependent specifications change; however,

it will not be signed as a formal package. In order to obtain all the necessary standalone packages, this specification's dependencies and their dependencies will have to be traversed and obtained. These packages will have to be downloaded and copied into the appropriate directories for paths to the schema and controlled vocabulary enumerations (CVEs) to validate and operate as intended.

Convenience packages convey all dependencies pre-packaged together and are tested as interoperable. When trying to mix and match versions that have not been pre-packaged together, there may be risk that a particular combination may not be compatible, especially when mixing with versions of specifications that were not available at the time of a specification's release.

## 1.8 - Conformance

The XML schemas (unless noted otherwise), CVE values from the XML CVE files, and any Schematron<sup>[40]</sup> rules are normative for this specification. The rest of this document and the rest of this package, including the descriptive content referenced within the XML Schema Guide, the XSL transformations, the SchematronGuide, and PDF CVE value files, are informative. Additionally, the use of keywords defined in IETF RFC 2119<sup>[23]</sup> is considered normative within the scope of the sentence. All other parts of this document are informative.

The XML schemas provided may import other specifications. The versions of dependency specifications imported are not normative in that to import a different version of a component specification you could modify the import or substitute a different version of the component using the existing import path. This could be done by changing the schema file or by using XML Catalogs.<sup>[47]</sup> For example, a schema could be changed to incorporate a different version of a dependency like ISM by changing the attribute declaration of **@ism:DESVersion='9'** to **@ism:DESVersion='10'** in the `xsd:schema` statement. The ability to specify which version of a dependent specification to import enables the configuration change control of parent specifications (such as PUBS and TDF) to be "decoupled" from the configuration change control of dependent specifications (such as ISM CVE updates). This "decoupling" method has not been in place for all versions of these parent specifications; therefore, please verify with the dependency table to ensure use of allowed dependency versions.

Additional guidance that is either classified or has handling controls can be found in separate annexes distributed to the appropriate networks and environments as necessary. Systems and services operating in those environments **MUST** consult the appropriate annexes.

## 1.9 - Version Policies

### 1.9.1 - XML Namespace Policy

The XML namespaces defined in this specification do not incorporate a version number and do not change with revisions of the specification. This choice aligns with perspective two from "The Disposition of Names in an XML Namespace."<sup>[42]</sup> This decision allows for systems that process information encoded with these specifications to use the same XPath expressions across multiple revisions. It was agreed the burden of updating all XPath based systems for every revision to the specification was unacceptable. See section 4.2.2 "Versioning and XML namespace policy" of "Architecture of the World Wide Web, Volume One."<sup>[44]</sup>

There is a version attribute (e.g. **@DESVersion**, **@CESVersion**, **@TESVersion**, **@version**) for each namespace defined in an IC CIO specification. Version attributes are used to capture the specification version number the specification author intends an instance to conform to. Namespaces do not change, so the version attribute is required to fully understand an instance document.

As changes to the specification are released, the version number captured in the “version” attribute increments. See [Section 1.9.2 - Version Numbering](#) for information on the numbering scheme.

This XML namespace policy only applies to the namespaces defined in this specification, any namespaces that are included by reference should define their own namespace policy.

## 1.9.2 - Version Numbering

The version numbering for this specification is defined by a year-month structure (e.g., YYYY-  
MMM). This provides a temporal representation of when the specification was released. When the version number is used in the version attribute, the expression follows the Augmented Backus-Naur Form<sup>[1]</sup> below:

### Version Format when used in the version attribute:

- [1] Version ::= [Year](#) [Month](#) [ "-" [CustomizationSuffix](#) ]
- [2] Year ::= 4( DIGIT )
- [3] Month ::= 2( DIGIT )
- [4] Customization ::= 1\*27(ALPHA / DIGIT / "\_" )  
Suffix

### Version in XML Lexicon

The following vocabulary helps explain the meaning of terms used in the version documentation, and it may further constrain the set of allowable values:

Version	The version number as it might be expressed in a DESVersion, CESVersion or other XML attribute for indicating the version being referenced.
Year	The four digit year from the version of the specification being referenced.
Month	The 2 digit month from the version of the specification being referenced.
CustomizationSuffix	An optional suffix used when customizing a version of a specification. This would be used to indicate that you have extended the specification in some fashion for a particular use case.

## Chapter 2 - Development Guidance

### 2.1 - Relationship to Abstract Data Definition and other encodings

The relationship of the XML structures defined in this encoding specification to the abstract terms defined in the ADD are described using a mapping table in the ADD. The mapping tables generally show the mapping to the encoding specification where a structure is defined, not where it is used. These mappings are provided for reference only. The complete set of encoding specification artifacts, both normative and informative, should be consulted in order to gain a complete understanding of this encoding specification.

The mappings in the ADD provide a starting point for the development of automated transformations between formats defined by the encoding specifications. However, it should be noted that when these transformations are used between formats with different levels of detail there might be some data loss.

### 2.2 - Additional guidance

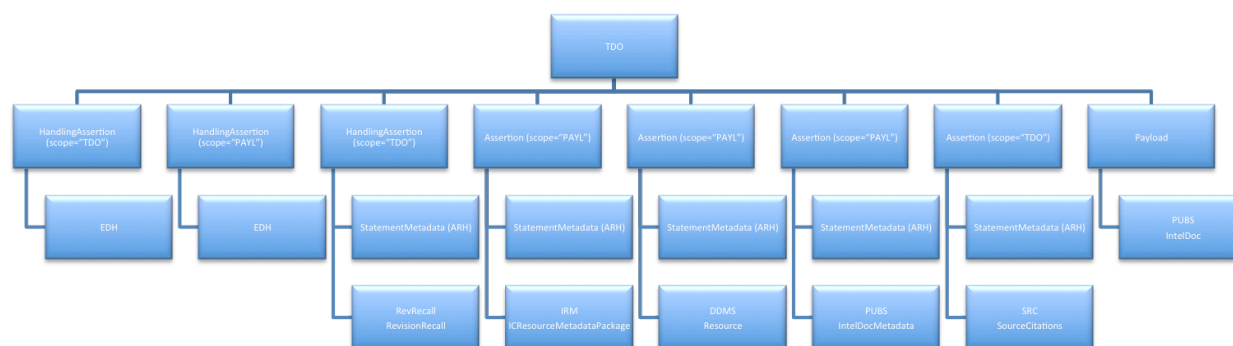
This section provides additional guidance for encoding data in specific situations. In particular, situations for which there is not clearly a single method of encoding the data are documented here. The content of this section will evolve over time as additional situations are identified. Implementers of this DES are encouraged to contact the maintainers of this DES for further guidance when necessary.

#### 2.2.1 - Publications Metadata Usage

PUBS.XML is used in conjunction with IC- TDF objects as structured assertions and content. A Trusted Data Object (TDO) conforms to the PUBS specification when it contains all of the following:

- Structured content with an IntelDoc element
- An assertion of scope PAYL with a structured statement containing an IRM ICResourceMetadataPackage element
- An assertion of scope PAYL with a structured statement containing a DDMS resource element
- An assertion of scope PAYL with a structured statement containing an IntelDocMetadata element





**Figure 2 : Diagram of PUBS Structure**

## 2.2.2 - Use of IC Resource Metadata Package

PUBS.XML uses the IRM.XML<sup>[25]</sup> element **irm:ICResourceMetadataPackage** and the DDMS<sup>[4]</sup> **ddms:resource** element to capture the bulk of the “library-card” metadata for the publication. **irm:ICResourceMetadataPackage** and **ddms:resource** are included as peer assertions in the TDO and also include several elements nearly identical in name and definition, though not structure, to those defined in IRM.XML<sup>[25]</sup>. These elements, such as **pubs:Title**, **pubs:Description**, etc. are duplicated in PUBS.XML to allow for the capture of a “rich-text-like” presentation of the data. Unless guidance is provided by the author of the data to the contrary, when duplicate elements appear in an instance document the elements in **irm:ICResourceMetadataPackage** and DDMS should be used for “metadata-like” functions such as indexing, metrics, etc. and the elements in **pubs:PublicationMetadata** should be used for display purposes. In both cases this should not have the effect of one set of elements overriding another.

## 2.2.3 - Specification of publishing organization

See the *XML Data Encoding Specification for Information Resource Metadata* (IRM.XML)<sup>[25]</sup> for details.

## 2.2.4 - Specification of Need-To-Know Access Parameters

The element **ntk:Access** is used to identify the parameters needed by a system to allow that system to automatically process an access request involving determination of Need-To-Know. See the *XML Data Encoding Specification for Need-To-Know Metadata* (NTK.XML)<sup>[37]</sup> for details.

## 2.2.5 - Specification of Production Metrics Reporting Metadata

Production Metrics Reporting Metadata is used to support reporting of production metrics as required by ODNI Deputy Director for Intelligence Integration. These metadata consist of paired values of coverage and subject, and are included as part of the IRM.XML<sup>[25]</sup>. See the *XML Data Encoding Specification for Information Resource Metadata* (IRM.XML)<sup>[25]</sup> for details.

## 2.2.6 - Specification of IntelDocMetadata

The element **pubs:IntelDocMetadata** is placed in the **tdf:StructuredStatement** of an assertion in a TDO. There must be at least one assertion of this type but there may be more than one. This is where the **pubs:DESVersion** is specified and if there are multiple assertions of this type then they all must have the same value for **pubs:DESVersion**.

## 2.2.7 - Specification of PublicationMetadata

The element **pubs:PublicationMetadata** is placed in the **pubs:IntelDoc** element. There must be at least one **pubs:PublicationMetadata** element but there may be more than one. For example, there may be multiple **pubs:PublicationMetadata** elements of differing classifications, supporting tearline operations the same way as there may be multiple DDMS assertions of differing classifications. One of the **pubs:PublicationMetadata** could be TOP SECRET while another could be SECRET. An example document "RogersRangersMultiMeta.xml" is provided in the Examples directory. The document is UNCLASSIFIED but has example FOUO markings to show having multiple **pubs:PublicationMetadata**. Ensure compliance with [PUBS-ID-00086](#); it requires classification of the individual **pubs:PublicationMetadata** elements when you have multiple **pubs:PublicationMetadata** elements.

## 2.2.8 - Specification of Notes and Security Notices

The elements **Note** and **NoteInline** are used to specify a comment or explanation of the data in nearby elements or text. Both elements are allowed in the body of the document and can be used to provide a notice near the location of the data requiring the notice.

The **pubs:NoteList** element is allowed as a child of the **pubs:IntelDocMetadata** element to specify **pubs:Note** sub-elements that pertain to an entire document. The **@noteType** attribute is used to further indicate the reason for the inclusion of the notice and/or the category to which the notice belongs.

To represent security-related notices, the **ISMNoticeAttributesGroup** can be included on a **pubs:Note** to indicate either a type of ISM recognized security notice using **@ism:noticeType**, or an unregistered security-related notice using **@ism:unregisteredNoticeType**. These attributes are analogous to the **@noteType** attribute, which is used to categorize a non-security-related notice. For additional information concerning security-related notices, see the document *XML Data Encoding Specification for Information Security Markings*.

See the example file *SourceCitations.xml* for a sample notice and use of the above structures for both security-related and non-security-related notices.

### 2.2.8.1 - Point Of Contact Requirements

For documents containing certain types of data or claiming compliance with specific directives, a point-of-contact to whom questions about the document can be directed is required. The **pubs:NoteList/pubs:Note** element can be used to fulfill these requirements by using the **@ism:noticeType** value of [POC] to indicate that the contents of a **pubs:Note** are used to provide contact information for security-related notices. The **ism:POCAttributeGroup's @ism:pocType** attribute indicates that the text of the **pubs:Note** element specifies the IC element

point-of-contact and contact instructions to expedite decisions on information sharing, while specifying which type(s) of information that contact should handle.

Example:

```
<Note
  ism:classification="U"
  ism:ownerProducer="USA"
  ism:noticeType="POC"
  ism:pocType="ICD-710 DoD-Dist-C">

  <Para>John Smith, AgencyX, 888-555-5555, jsmith@agencyx.gov</Para>

</Note>
```

The attributes in the **ism:POCAttributeGroup** are also allowed on the entity information elements **pubs:AuthorInfo**, **pubs:CoauthorInfo**, **pubs:POCInfo** and **pubs:ContributingAuthorInfo**. For further granularity, these elements may use the **@ism:pocType** attribute to indicate that its element structures contain the contact information for a point-of-contact requirement.

Example:

```
<AuthorInfo ism:pocType="DoD-Dist-F">
  <Surname>Smith</Surname>
  <GivenName>John</GivenName>
  <PhoneNumber>888-555-5555</PhoneNumber>
  <Affiliation>AgencyX</Affiliation>
  <EmailAddress>jsmith@agencyx.gov</EmailAddress>
</AuthorInfo>
```

## 2.2.9 - Specification of Approximable dates

Some dates used, including **ddms:acquiredOn** and temporal coverage date ranges, use a construct to support approximate dates and date ranges. Approximable dates can be expressed in any of three encodings: a free-text date string, a single ISO 8601 date, or a pair of dates encoded as *xsd:dateTime* values. The three encodings allow for different degrees of precision in the date value and varying processing expectations.

### 2.2.9.1 - Date String

A date string has no vocabulary associated with it and few if any constraints. A date string may be broad or precise, but there is no expectation that systems process date strings as proper dates or date ranges, and there is no expectation that systems use date strings in temporal searches; search engines may index the string for text searches. Examples of date strings include “sometime last week,” “Ramadan 2010,” and “Tuesday.”

### 2.2.9.2 - Single ISO 8601 Format Date

A single ISO 8601<sup>[33]</sup> format date may be used with or without the optional **@approximation** attribute. ISO 8601<sup>[33]</sup> format dates support levels of specificity and the **@approximation** attribute modifies the date with values such as early, late, or circa. For example, an ISO 8601 format date could express any of the following:

- 2010
- Early 2010
- Circa 2010-01
- 2010-01-01
- 2010-01-01T12
- 2010-01-01T12:30

The parsing of an ISO 8601<sup>[33]</sup> format date is well defined, but search and discovery behavior is still ambiguous. That is, the specific criteria for returning a record marked with a partial date or a date with an **@approximation** attribute is up to each search engine to decide. For example, some IC systems interpret the partial date 2010 as 2010-01-01T00:00:00.0Z exactly, while other systems interpret the same value (2010) as matching all dates and times in 2010.

### 2.2.9.3 - Date Pair

A pair of *xsd:dateTime* dates may be used to encode a date range: one representing the start of the range and the other the end of the range. Using a date range for an approximate date simplifies searching and provides a clear processing expectation. Since each value in the pair is an *xsd:dateTime*, partial dates are not supported. All systems processing dates encoded in this manner should execute queries using a formula equivalent to

EarliestDate <= QueryValue < LatestDate

For example, encoding “2010” using an EarliestDate of 2010-01-01T00:00:00Z and a LatestDate of 2011-01-01T00:00:00Z clearly indicates that the date “2010” represents any date-time in 2010. Using the starting/earliest and ending/latest date encodings of a date provides the most clarity and gives the producer of the data the greatest control of exactly how that data should be handled by a system.

If a data producer wants to specify the preferred interpretation for either string or approximate ISO 8601 encoded dates, they should also specify the “earliest/latest” values which best encode their intention. It is expected that systems will use date pairs when present for any date-based discovery or retrieval; string and approximate ISO 8601 dates may be used for display.

### 2.2.10 - Approximate Dates in Constraint Rules

- When only a string is specified, the constraint rules will assume that the date passes any constraints involving it.
- When an ISO 8601<sup>[33]</sup> date is specified with varying amounts of precision, the constraint rules will determine if the valid date is a subset of the date specified. For example, 2010 is before 2010-10; since 2010 encompasses all dates in 2010, the valid dates prior to October 2010 are included in that set and the rule would pass. Similarly, 2010 is also after 2010-10 since it encompasses all the dates after October. However, 2010-10 is not before 2010-05 because none of the dates encompassed by 2010-10 occurred prior to 2010-05.

- When earliest/latest values are specified, the rules should still determine if any of the range would satisfy and if so the rule passes.
- When more than one encoding is specified, the most restrictive will be used.
  - Use ISO over String
  - Use earliest/latest over ISO

## 2.2.11 - MIME Type

The Multipurpose Internet Mail Extensions (MIME) type for a PUBS.XML document is application/dni-pubs+xml. This is a convention for our community. This type has NOT been registered with the Internet Assigned Numbers Authority (IANA). Should there be a conflict in the future, it will be addressed at that time. Systems can use this MIME type to facilitate communications and address business needs within the community.

## 2.2.12 - Specification of Source Citations

Source citations for covered analytic products leverage SRC.XML. The container for citations, **pubs:SourceGroup**, has elements **pubs:SourceReferenceCitationRef** and **pubs:AppendedReferenceCitationRef** that point to SRC.XML's **src:SourceReferenceCitation** and **src:AppendedReferenceCitation** respectively. The source reference citations (SRC) and appended reference citations (ARC) live within the SRC.XML's root element **src:SourceCitations** which lives as a TDF assertion.

The source references for a related resource, **pubs:Relation**, do not leverage SRC.XML and use the **pubs:SourceReference** element instead.

## Chapter 3 - Definitions, Interfaces, and Constraints

### 3.1 - Constraint Rule Types

Data constraint rules fall into two categories - validation and rendering constraints. Data validation constraints explicitly define policy validation constraints, describing how data should be structured and encoded in order to comply with IC policy. Validation constraint rules are implemented as a combination of basic XML Schema constraints and supplemental constraints for more complex rules. Complex constraint rules contain technical rule descriptions, Schematron rule implementations, and *Human Readable* descriptions. The human readable text describes the intent and meaning behind the more technical rule description. The semantics of the constraint rules are normative, whereas the use of the Schematron implementation is informative. Implementers developing alternative validation code should follow the technical rule descriptions and Schematron logic. Should there be a perception of conflict, implementers should bring it to the attention of the appropriate configuration control body for resolution. Rendering constraint rules define constraints on the display and rendering of documents. While expressed in a similar manner to the data validation constraint rules, there is no expectation that evaluation of these rules can be automated; rather these rules should inform the evaluation of a system's capabilities and functionality.

### 3.2 - "Living" Constraint Rules

These constraint rules are a "living" rule set. The constraint rules provided are a starter set and do not attempt to address the full scope tradecraft and business rules addressed by multiple policy drivers including Sourcing Requirements for Disseminated Intelligence Products as defined by ICD 206.<sup>[13]</sup> These rules will be expanded and modified as the model matures, and as applicable documentation and tradecraft policies change.

Since these constraint rules are only a subset of the entire rule base, an XML document that is compliant with these rules may still not be fully compliant with all of the business rules defined in the authoritative guidance. An XML document that is not compliant with these rules is not compliant with the authoritative guidance.

### 3.3 - Classified or Controlled Constraint Rules

Additional rules that are either classified or have handling controls can be found in separate annexes closely associated with the encoding specification artifacts wherever they are located.

### 3.4 - Constraint Terminology

For the purposes of this document, the following statements apply:

- The term "is specified" indicates that an attribute is applied to an element and the attribute has a non-null value.
- The term "must be specified" indicates that an attribute **MUST** be applied to an element and the attribute **MUST** have a non-null value.
- The term "is not specified" indicates that an attribute is not applied to an element, or an attribute is applied to an element and the attribute has a null value.

- The term “must not be specified” indicates that an attribute **MUST NOT** be applied to an element.

## 3.5 - Errors and Warnings

The severity of a constraint rule violation is categorized as either an “Error” or a “Warning.” An “Error” is more severe and is indicative of a clear violation of a constraint rule, which would be likely to have a significant impact on the quality of a document. A “Warning” is less severe although noteworthy, and may not necessarily have any impact on the quality of a document. The severity of a constraint rule violation is indicated in brackets preceding each constraint rule description.

Each system responsible for processing a document (e.g., create, modify, transform, or exchange) **MUST** make a mission-appropriate decision about using a document with errors or warnings based on mission needs.

## 3.6 - Rule Identifiers

Each constraint rule has an assigned rule identifier, indicated in brackets preceding the constraint rule description. PUBS.XML data validation constraint rule identifiers are prefixed with "PUBS-ID-" and followed by a 5 digit unique number, assigned from pre-defined ranges to group rules by classification. The numerical ranges are described in [Section 3.6 - Rule Identifiers \[17\]](#). As the constraint rules are managed over time, IDs from deleted rules will not be reused.

**Table 3 - Numerical Rule Identifier Ranges**

Rule Identifier Range		Description
Start	End	
00001	09999	Reserved for Unclassified constraint rules
10001	19999	Reserved for Unclassified but For Official Use Only (FOUO) constraint rules
20001	20999	Reserved for constraint rules classified at the “Secret//REL USA, FVEY” level
21001	21999	Reserved for constraint rules classified at the “Secret//NF” level
22001	29999	Reserved for constraint rules classified at the “Secret//TBD” level
30001 and above		Reserved for constraint rules classified with other classifications

## 3.7 - Data Validation Constraint Rules

### 3.7.1 - Purpose

The PUBS.XML schema defines the data elements, attributes, cardinalities and parent-child relationships for which XML instances must comply. Validation of these syntax aspects is an important first step in the validation process. An additional level of validation is needed to ensure that the content complies with the constraints as specified in applicable IC policy guidance and codified in these constraint rules. Traditional schema languages are generally unable to effectively represent these additional constraints.

## 3.7.2 - Schematron

Schematron<sup>[40]</sup> is the formal language used in this specification to encode normative data validation constraints. The Schematron rules are normative in the sense that they convey criteria a document **MUST** meet, exactly as English may be used to convey normative criteria.

It is not necessary for implementers to use the specific Schematron encoding in this specification, and implementers **MAY** use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. To conform to this specification, a validator **MUST** find a document valid *if and only if* the Schematron implementation by Mr. Jelliffe would find the document valid according to the Schematron rules in this specification.

For better understanding, the Schematron<sup>[40]</sup> rules for this specification may be executed in *Oxygen*<sup>[39]</sup> or with an XSLT 2.0-compliant processor using the XSLT 2.0<sup>[49]</sup> transforms in the Schematron implementation from Rick Jelliffe (see [XSLT 2.0 implementation of Schematron by Rick Jelliffe](#) in the Dependency table).

The constraint rules for this specification are dependent on XPath 2.0<sup>[48]</sup> and XSLT 2.0<sup>[49]</sup> features. Regarding the use of XPath 2.0 and XSLT 2.0 with Schematron, the editor of the ISO Schematron standard stated the following:<sup>[34]</sup>

By default, Schematron uses the XPath language as used in XSLT 1.0, and is typically implemented by converting the schema into an XSLT 1.0 script which is run against the document being validated. However, ISO Schematron also allows XSLT 2.0 to be used, and this is becoming an increasingly popular choice because of the extra expressive convenience of XPath 2.0: a different skeleton is available for this.



### Note

For convenience, the specification package provides the XSLT 2.0<sup>[49]</sup> implementation of Schematron<sup>[40]</sup> along with a compiled version of the rules.

## 3.7.3 - Non-null Constraints

XML syntax allows all elements with content declared to be of data type “string” to have zero or more characters of content, meaning elements can be empty or null. According to this specification, all required elements (and certain conditional elements) **MUST** have content, other than white space.<sup>1</sup> Elements, which are allowed to only have text content, **MUST** have text content specified.

## 3.7.4 - Inherited Constraints

In an instance of PUBS.XML, the use of attributes and elements from supplementary data encoding specifications must be fully conformant with the constraint rules defined in those specifications. For a full list of supplementary specifications, see [Section 1.7 - Dependencies](#).

<sup>1</sup>“White space” is defined in XML 1.0<sup>[46]</sup> as “(white space) consists of one or more space (#x20) characters, carriage returns, line feeds, or tabs.”



## 3.7.5 - Value Enumeration Constraints

Several elements and attributes of the PUBS.XML model use CVEs to define the data allowed in the element or attribute. In some cases the specific CVE is specified via an attribute, which may include a default CVE. Further, in some of the cases where the CVE can be specified, the attribute may restrict the list of CVEs allowed and some may allow for the author to specify their own CVE. For each of these, the value must be in the specified external CVE or the default CVE.

Some CVEs are not available on all networks. A subset CVE will be provided for use on networks not approved for the entire list. If the processing will occur on a network where the entire CVE is not available, the subset CVE may be substituted in the constraint rules since the excluded values would be excluded from use on the lower network.

As noted in the specific rules, a failure of validation against a CVE will generate an Error.

## 3.7.6 - Additional Constraints

### 3.7.6.1 - DES Constraints

The DES version is specified through attributes on the root element. The schema constrains the values of these attributes. The **@DESVersion** attribute enables systems processing an instance document to be certain which set of constraint rules, schema, CVEs and business rules are intended by the author to be used.

## 3.7.7 - Constraint Rules

The detailed constraint rules for the PUBS.XML schema can be found in a separate document inside the SchematronGuide directory, in the PUBS\_Rules.pdf file. This document is generated from the individual Schematron files to provide a single searchable document for all of the constraint rules encoded in Schematron. Obsolete rule numbers are listed in the SchematronGuide.

## 3.7.8 - Dates and Times

Except for attribute **@date** for which the data type is "xsd:date," the data type of each PUBS.XML date/time-related element and attribute is specified as one of four custom simple types defined to allow the full range of allowable patterns specified in the DES for that element or attribute. These four custom simple types are in fact unions of appropriate World Wide Web Consortium (W3C) primitive data types, three of which also include in the union one of two additional custom simple types defined to allow seconds to be optional in time specifications. Schema validation will automatically ensure conformity to the data types. Validations and time comparisons will use the Zulu (Z) time zone when a time zone indicator is absent.

The following table summarizes the data types and allowable layout of representations for each of the PUBS.XML date/time-related elements and attributes.

**Table 4 - Date/Time-Related Data Types and Layout Representations**

Element or Attribute	Data Type	Layout of Representation
<b>DateApproved</b>	ISO8601DateTimeType	YYYY(Z   ±hh:mm)?
<b>DateReceived</b>		YYYY-MM(Z   ±hh:mm)?
<b>DatePosted</b>		YYYY-MM-DD(Z   ±hh:mm)?
<b>DatePublished</b>		YYYY-MM-DDThh:mm(Z   ±hh:mm)?
<b>DateReviewed</b>		
<b>DateRevised</b>		YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?
<b>DateValidTil</b>		
<b>@normalizedDateTime</b>		
<b>DateTimeReferenced</b>		
<b>DateString</b>	common:ShortStringType	A string less than 256 characters such as "Independence day 1980"
<b>DateInformation</b>	ApproximableDateTime-StructureType	A structure consisting of one or more values including a <b>DateString</b> , <b>ApproximableDateTime</b> , <b>ApproximableDateTimeStart</b> , and <b>ApproximableDateTimeEnd</b> ,
<b>DateInfoCutoff</b>		
<b>DateAcquired</b>		
<b>ApproximableDateTime</b>	ApproximableDateTime-Type	YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?with optional <b>@approximation</b>
<b>ApproximableDateTime-Start</b>		
<b>ApproximableDateTime-End</b>		
<b>EarliestStartDate</b>	xsd:dateTime	YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?
<b>LatestEndDate</b>		
<b>@date</b>	xsd:date	YYYY-MM-DD(Z   ±hh:mm)?

Element or Attribute	Data Type	Layout of Representation
<b>@dateTime</b>	dateTimesType	(YYYY(Z   ±hh:mm)?   YYYY-MM(Z   ±hh:mm)?   YYYY-MM-DD(Z   ±hh:mm)?   YYYY-MM-DDThh:mm(Z   ±hh:mm)   YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?)+
<b>@normalizedDate</b>	ISO8601DateType	YYYY(Z   ±hh:mm)?   YYYY-MM(Z   ±hh:mm)?   YYYY-MM-DD(Z   ±hh:mm)?
<b>@normalizedTime</b>	ISO8601TimeType	hh:mm(Z   ±hh:mm)   hh:mm:ss(.s)?(Z   ±hh:mm)?
<b>@dateTimeRange</b>	dateTimePairsType	((YYYY(Z   ±hh:mm)?   YYYY-MM(Z   ±hh:mm)?   YYYY-MM-DD(Z   ±hh:mm)?   YYYY-MM-DDThh:mm(Z   ±hh:mm)   YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?), (YYYY(Z   ±hh:mm)?   YYYY-MM(Z   ±hh:mm)?   YYYY-MM-DD(Z   ±hh:mm)?   YYYY-MM-DDThh:mm(Z   ±hh:mm)   YYYY-MM-DDThh:mm:ss(.s)?(Z   ±hh:mm)?))+

### 3.7.9 - Time Zone Indicators

Validations and time comparisons will use the Zulu (Z) time zone when a time zone is absent. It is recommended that the optional time zone be specified either as Zulu (Z) or as ±hh:mm where applicable.

### 3.7.10 - Information Security Markings (ISM.XML<sup>[26]</sup>)

Most constraint rules specific to the application of information security markings are documented in the XML *Data Encoding Specification for Information Security Marking Metadata* and related documents. The rules in this section are additional constraints on the specific implementation of ISM in PUBS.XML .

## 3.8 - Data Rendering Constraint Rules

### 3.8.1 - Purpose

Rendering rules define constraints on the rendering and display of PUBS.XML documents. The intent is to inform the development of systems capable of rendering or displaying PUBS.XML data for use by individuals not familiar with the details of the PUBS.XML markup. While expressed in a similar manner to the data validation constraint rules above, there is no expectation that evaluation of these rules can be automated; rather these rules should inform the evaluation of a system's capabilities and functionality.

### 3.8.2 - Rendering Constraint Rules

The following table contains the information for the PUBS.XML data rendering constraint rules.

**Table 5 - Constraint Rules**

Rule Number	Severity	Description	Human Readable Description
[PUBS-RENDER-00001]	[Error]	When element <b>rr:RevisionRecall</b> is present the text of the attribute <b>@rr:revisionType</b> shall be rendered in uppercase as the first part of the document title immediately following the classification portion mark and will be followed with a “.”.	Systems used for rendering data containing the RevisionRecall element will produce rendered documents that comply with the August 5, 2005 Negroponte Revision Recall Memo <sup>[5]</sup> , and the specific style described.

## Chapter 4 - Conformance Validation

An instance document conforms with this specification if it conforms to all normative guidance of this specification and this specification's dependencies and it passes all of the following validation steps. This specification does not dictate how this validation strategy is implemented.

### 4.1 - Schema Validation

An instance document **MUST** comply with the schemas for this specification and this specification's dependencies, and schema validation **SHOULD** occur prior to other validation steps. If schema validation fails, results from later steps may be indeterminate.

### 4.2 - Business Rule Validation

An instance document **MUST** comply with the business rules expressed in this specification and those expressed in this specification's dependencies. The business rules in this specification are expressed in Schematron, but it is not necessary for implementers to use the specific Schematron encoding in this specification. Implementers **MAY** use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. To conform to this specification, a validator **MUST** find a document valid *if and only if* the Schematron implementation by Mr. Jelliffe would find the document valid according to the Schematron rules in this specification.

## Chapter 5 - Generated Guides

### 5.1 - Schema Guide

The detailed description and reference documentation for the PUBS.XML schema can be found as a collection of HTML files inside the SchemaGuide directory. These files comprise a guide that serves as an interactive presentation of the PUBS.XML schema as well as an implementation-specific data element dictionary.

The guide was generated with a commercially available product named *oXygen*<sup>[39]</sup>, produced by SyncRO Soft.

The guide provides an interactive index to:

- Global Elements and Attributes
- Local Elements and Attributes
- Simple and Complex Types
- Groups and Attribute Groups
- Referenced Schemas

Where applicable, the guide provides:

- Diagram
- Namespace
- Type
- Children (Child Elements)
- Used by
- Properties
- Patterns
- Enumerations
- Attributes
- Annotations
- Source Code

The guide is published in a folder consisting of the master HTML file *SchemaGuide.html* with supporting graphics.

## 5.2 - Schematron Guide

The detailed description and reference documentation for the PUBS.XML Schematron rules can be found in a separate document named *PUBS\_Rules.pdf*, which is located inside the SchematronGuide directory. This document is generated from the individual Schematron<sup>[40]</sup> files to provide a single searchable document for all of the constraint rules encoded in Schematron<sup>[40]</sup>.

Appendix A Feature Summary

The following table shows the version dependencies for PUBS on other specifications. Direct dependencies are marked with an asterisk.

Table 6 - PUBS Dependency over Time

Dependent DES	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	v2014-DEC	v2015-AUG	v2016-SEP
ISM*	V1	V2	V3	V4	V5	V6	V7	V7	V8	V9	V9+	V9+	V9+	V13+	V13+
NTK			V1	V2	V3	V4	V5	V5	V6	V7	V7+	V7+	V7+	V10+	V10+
IRM*				V2	V3	V4	V5	V6	V7	V8	V9+	V9+	V9+	V11+	V12+
DDMS*				V3	V3	V3	V3	V4	V4	V4.1	V5	V5	V5	V5	V5
IC-TDF*											V1+	V1+	V1+	V3+	V3+
ARH											V1+	V1+	V1+	V3+	V3+
IC-EDH*											V1+	V1+	V1+	V4+	V4+
RevRecall													V1+	V1+	V1+
SRC*														V1+	V2015-AUG+
INTDIS*														V1+	V2015-AUG+
MIME*															V2016-SEP+
ISMCAT*															V2015-MAY+
USAgency															V2015-FEB+
MN															V2015-AUG+
LIC															V2015-AUG+
IC-ID															V1+
IC-GENC															V2015-MAY+
PM															V2015-AUG+
VIRT*															V1+

The following tables summarize major features by version for PUBS.

Table 7 - Feature Summary Legend

Key	Description
F	Full (able to comply and verified by spec to some degree)
P	Partial (Able to comply but not verifiable)
N	Non-compliance (Can't comply)
N/A	Not Applicable. Feature is no longer required.
Cell Colors represent the same information as the Key value	



A.1. PUBS Feature Summary

Table 8 - PUBS Feature Comparison

Required date	Feature	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V2014-DEC	V2015-AUG	V2016-SEP
	Support ICD 206 <sup>[13]</sup>	P	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	Revision Recall <sup>[5]</sup>	N	F	F	F	F	F	F	F	F	F	F	F	N/A <sup>a</sup>	N/A <sup>a</sup>	N/A <sup>a</sup>
	Use NTK	N	N	F	F	F	F	F	F	F	F	F	F	F	F	F
	Use ProductionMetrics	N	N	F	F	F	F	F	F	F	F	F	F	F	F	F
	RecordKeeper RecordsManagementInfo	N	N	N	F	F	F	F	F	F	F	F	F	F	F	F
	National HUMINT Requests: <ul style="list-style-type: none"><li>• Non State Actor support</li><li>• Approximable Dates</li><li>• CollectionSource</li><li>• DateAcquired</li><li>• Attachments</li></ul>	N	N	N	N	F	F	F	F	F	F	F	F	F	F	F
	MIME Types	N	N	N	N	F	F	F	F	F	F	F	F	F	F	F
	National HUMINT Requests-2: <ul style="list-style-type: none"><li>• SubCountryCodes</li><li>• Ordering of CountryCode or SubCountry or NonState</li></ul>	N	N	N	N	F	F	F	F	F	F	F	F	F	F	F
	Forbade use of ISO 3166-1 <sup>[31]</sup> Digraph/Numeric codes	N	N	N	N	N	F	F	F	F	F	F	F	F	F	F
	Schematron <sup>[40]</sup> Implementation of rules	N	N	N	N	N	F	F	F	F	F	F	F	F	F	F
	SouthSudan	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F
	irm:ProcessingInfoList support	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F
	DateReceived	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F
	Schema validation of CVE values	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F
	CityName element	N	N	N	F	N	N	F	F	F	F	F	F	F	F	F
	Security Mark SourcedText	P	P	P	P	P	P	F	F	F	F	F	F	F	F	F
	XLink 1.1 <sup>[45]</sup>	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F
	ORCON Memo support <sup>[38]</sup>	P	P	P	P	P	P	F	F	F	F	F	F	F	F	F
	Equation Element useable	F	F	F	F	F	N	N	F	F	F	F	F	F	F	F

Required date	Feature	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V2014-DEC	V2015-AUG	V2016-SEP
	decimalDegreeCoordinates on several elements	N	N	N	N	N	N	N	F	F	F	F	F	F	F	F
	Allow Documents starting with a Section	F	F	F	F	N	N	N	N	F	F	F	F	F	F	F
	Time with more than 3 decimal precision	N	N	N	N	N	N	N	N	F	F	F	F	F	F	F
	Classification on AudienceVariation and AlternateFormatType	N	N	N	N	N	N	N	N	F	F	F	F	F	F	F
	Use of IRM for most of IntelDocMetadata	N	N	N	N	N	N	N	N	N	F	F	F	F	F	F
	Use TDO as container for all PUBS components	N	N	N	N	N	N	N	N	N	N	F	F	F	F	F
	Version decoupling, allowing import of any version of ISM and other dependent specifications at or above ISM v9+, NTKv7+, ARHv1+, TDFv1+ and EDHv1+	N	N	N	N	N	N	N	N	N	N	F	F	F	F	F
	Recursive XHTML tables	N	N	N	N	N	N	N	N	N	N	N	F	F	F	F
	Updating PUBS to use SRC specification	N	N	N	N	N	N	N	N	N	N	N	N	N	F	F
	Reference to external CVE for IntelDiscipline	N	N	N	N	N	N	N	N	N	N	N	N	N	F	F
	Reference to external CVE for pubs:Agency edh:ResponsibleEntityType	N	N	N	N	N	N	N	N	N	N	N	N	N	F	F
	Reference to external CVE for MIME	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F

<sup>a</sup>This feature is now supported through the use of a RevRecall assertion.

## Appendix B Change History

The following table summarizes the version identifier history for this DES.

**Table 9 - DES Version Identifier History**

Version	Date	Purpose
1.0	August 2008	Initial Release
2	24 December 2009	Routine revision to technical specification. For details of changes, see <a href="#">Section B.14 - V2 Change Summary</a>
3	11 May 2010	Routine revision to technical specification. For details of changes, see <a href="#">Section B.13 - V3 Change Summary</a>
4	7 September 2010	Routine revision to technical specification. For details of changes, see <a href="#">Section B.12 - V4 Change Summary</a>
5	6 December 2010	Routine revision to technical specification. For details of changes, see <a href="#">Section B.11 - V5 Change Summary</a>
6	11 April 2011	Routine revision to technical specification. For details of changes, see <a href="#">Section B.10 - V6 Change Summary</a>
7	19 September 2011	Routine revision to technical specification. For details of changes, see <a href="#">Section B.9 - V7 Change Summary</a>
8	7 December 2011	Routine revision to technical specification. For details of changes, see <a href="#">Section B.8 - V8 Change Summary</a>
9	27 February 2012	Routine revision to technical specification. For details of changes, see <a href="#">Section B.7 - V9 Change Summary</a>
10	17 July 2012	Routine revision to technical specification. For details of changes, see <a href="#">Section B.6 - V10 Change Summary</a>
11	21 January 2013	Routine revision to technical specification. For details of changes, see <a href="#">Section B.5 - V11 Change Summary</a>
12	5 April 2013	Routine revision to technical specification. For details of changes, see <a href="#">Section B.4 - V12 Change Summary</a>
2014-DEC	4 December 2014	Routine revision to technical specification. For details of changes, see <a href="#">Section B.3 - V2014-DEC Change Summary</a>
2015-AUG	13 August 2015	Routine revision to technical specification. For details of changes, see <a href="#">Section B.2 - V2015-AUG Change Summary</a>
2016-SEP	9 September 2016	Routine revision to technical specification. For details of changes, see <a href="#">Section B.1 - V2016-SEP Change Summary</a>

### B.1 - V2016-SEP Change Summary

Significant drivers for Version 2016-SEP include:

- Consolidation of MIME types into MIME.CES and its use in other specs.

The following table summarizes the changes made to V2015-AUG in developing V2016-SEP.

**Table 10 - Data Encoding Specification V2016-SEP Change Summary**

Change	Artifacts changed	Compatibility Notes
Updated PUBS to use MIME CVE instead of PUBS CVE for MIME types. (CR-2015-048)	Schematron PUBS_XML.sch updated PUBS-ID-00075 deleted	Data generation and ingestion systems need to be updated to enforce the modified rule.
Added optional MIME and INTDIS CESVersion attributes to PUBS attribute group. (CR-2015-048)	Schema IC-PUBS.xsd updated. Schematron PUBS-ID-00118 added PUBS-ID-00119 added PUBS-ID-00120 added PUBS-ID-00121 added	Data generation and ingestion systems need to be updated to enforce the modified rule.
Removed PUBS mime type CVE. (CR-2015-048)	CVE CVEnumPubsMimeType.xml removed	Data generation and ingestion systems need to be updated to enforce the modified rule.
Update PUBS to use DDMS for language codes. (CR-2014-056, CR-2016-009)	Schema Schematron PUBS-ID-00001 updated PUBS-ID-00003 updated PUBS-ID-00024 deleted PUBS-ID-00025 deleted PUBS-ID-00122 added	Data generation and ingestion systems need to be updated to enforce the modified rules.

Change	Artifacts changed	Compatibility Notes
Updated schematron rules to enforce minimum versions defined in specification dependency table 1.7.	Schematron PUBS-ID-00114 updated. PUBS-ID-00123 added. PUBS-ID-00124 added. PUBS-ID-00125 added. PUBS-ID-00126 added. PUBS-ID-00127 added. PUBS-ID-00128 added. PUBS-ID-00129 added.	Systems need to be updated to accommodate this change.
The schema change logs will no longer be maintained as of the 2016-SEP release. The existing change logs will only serve as legacy information. For changes to schema as of and after 2016-SEP, reference the change history in the DES.	Schema	No impact to systems.
Restored schematron rule.	Schematron PUBS-ID-00086 restored.	Systems need to be updated to accommodate this change.
Update applicability section to reflect a requirement to comply with Law/Policy (CR-2016-063)	Documentation	Implementers must verify that they are complying with applicable laws and policies.

## B.2 - V2015-AUG Change Summary

Significant drivers for Version 2015-AUG include:

- Update of ICD 206<sup>[13]</sup>
- Alignment with standalone CVE specifications

The following table summarizes the changes made to V2014-DEC in developing V2015-AUG.

**Table 11 - Data Encoding Specification V2015-AUG Change Summary**

Change	Artifacts changed	Compatibility Notes
Updated PUBS.XML to leverage SRC.XML for source referencing of covered analytic products. Source referencing for related resources however does NOT leverage SRC.XML and uses the pubs:SourceReference element.	DES Schema Examples Schematron PUBS-ID-00117 added PUBS-ID-00104 changed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
Updated PUBS.XML to point to IntelDiscipline CVE	DES Schema Schematron PUBS-ID-00020 removed PUBS-ID-00021 removed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
Updated PUBS.XML example files to use UUID instead of meaningful suffixes.	DES Examples	Data generation and ingestion systems need to be aware of the changes.
Updated PUBS.XML to use pubs:Agency (edh:ResponsibleEntityType) in place of pubs:AgencyAcronym to better support international agencies.	Schema Schematron PUBS-ID-00076 removed	Data generation and ingestion systems need to be updated to support the latest version of the schema and Schematron rules.
Updated code descriptions to improve readability.	Schematron	No impact to data generation and ingestion systems.
Added notation "s" indicating Strike-through to EmphasizedText's emphasisType attribute.	Schema	Impacts data rendering systems.
Removed CVEnum-PubsAgencyAcronym CVE	CVEnum-PubsAgencyAcronym.xml removed	CVE no longer used in PUBS.

Change	Artifacts changed	Compatibility Notes
Update rule PUBS-ID-00081, PUBS-ID-00116 to simplify	Schematron  PUBS-ID-00081 changed  PUBS-ID-00116 changed	Updated rules should behave as before so no impact to systems.
Update to replace contexts of “[//” with “[descendant::” so that rules would not fire in TDC’s when they should not.	Schematron  PUBS-ID-00045 changed  PUBS-ID-00046 changed  PUBS-ID-00047 changed  PUBS-ID-00049 changed  PUBS-ID-00050 changed  PUBS-ID-00111 changed  PUBS-ID-00110 changed  PUBS-ID-00113 changed  PUBS-ID-00003 changed  PUBS-ID-00070 changed  PUBS-ID-00079 changed	Updated rules should behave as before for TDOs so no impact to TDO systems. Systems using TDCs should see fewer errors.

## B.3 - V2014-DEC Change Summary

Significant drivers for Version 2014-DEC include:

- Bring PUBS into alignment with modern versions of its dependencies.
- Maintenance revision.

The following table summarizes the changes made to V12 in developing V2014-DEC.

**Table 12 - Data Encoding Specification V2014-DEC Change Summary**

Change	Artifacts changed	Compatibility Notes
Corrected ISMCATCESVersion to replace 12 with 2.	CVEnum-PubsAgencyAcronym.xml	Minor correction to metadata in CVE should have minimal or no impact to implementing systems.
Removed the RevisionRecall element. This feature was deprecated with DDMS v4.0 and is now being removed entirely.	Schema	Data generation and ingestion systems need to be updated to support the latest version of the schema.
Changed DESVersion to represent the year and month of release. Also allowed for extension of specification by adding a '-' followed by a string to denote a custom implementation.	DES Schema Schematron PUBS-ID-00114 changed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
Restored rules PUBS-ID-00020 and PUBS-ID-00021 as they were in version 10 due to use of IntelDiscipline as a child of SourceReference.	Schematron PUBS-ID-00020 restored PUBS-ID-00021 restored	Data generation and ingestion systems need to be updated to enforce the rules.
Updated PUBS-ID-00116 to work with TDCs	PUBS-ID-00116 changed	Data generation and ingestion systems need to be updated to enforce the rules.

## B.4 - V12 Change Summary

Significant drivers for Version 12 include:

- Support for recursive XHTML tables

The following table summarizes the changes made to V11 in developing V12.

**Table 13 - Data Encoding Specification V12 Change Summary**

Change	Artifacts changed	Compatibility Notes
Removed several orphaned elements left over from the upgrade to DDMSv5 from the PUBS Schema.	Schema	Data generation and ingestion systems need to be updated to support the latest version of the schema.
Added XHTML tables to the PUBS Schema.	Schema	Data generation and ingestion systems need to be updated to support the new tables.



Change	Artifacts changed	Compatibility Notes
Corrected scopes of rules focused on DDMS attributes and elements to restrict DDMS assertions only.	Schematron PUBS-ID-00003 PUBS-ID-00045 PUBS-ID-00047 PUBS-ID-00049 PUBS-ID-00050 PUBS-ID-00070 PUBS-ID-00079 PUBS-ID-00110 PUBS-ID-00111	Data generation and ingestion systems need to be aware of the changes.

## B.5 - V11 Change Summary

Significant drivers for Version 11 include:

- See ISM V10 drivers
- See IRM V9 drivers

The following table summarizes the changes made to V10 in developing V11.

**Table 14 - Data Encoding Specification V11 Change Summary**

Change	Artifacts changed	Compatibility Notes
Added Schematron rules to ensure that the versions of the imported specs meet the minimum allowed versions.	Schematron PUBS-ID-00114	Data generation and ingestion systems need to be updated enforce the new rules.
Updated the @ddms:qualifiers values in the Examples files to be actual values.	Examples	Data generation and ingestion systems should not need to be updated.

Change	Artifacts changed	Compatibility Notes
Moved several rules to IRM as they should be run whenever DDMS is present, not just if the XML Instance is a PUBS document.	<p>Schematron</p> <p>PUBS-ID-00088 Removed (IRM-ID-00075)</p> <p>PUBS-ID-00090 Removed (IRM-ID-00078)</p> <p>PUBS-ID-00105 Removed (IRM-ID-00077)</p> <p>PUBS-ID-00107 Removed (IRM-ID-00076)</p> <p>PUBS-ID-00109 Removed (IRM-ID-00074)</p>	Data generation and ingestion systems need to be updated to no longer enforce the removed rules, and instead upgraded to enforce the IRM versions.
Removed several rules that are covered under rules in other specifications.	<p>Schematron</p> <p>PUBS-ID-00020 Removed</p> <p>PUBS-ID-00021 Removed</p> <p>PUBS-ID-00022 Removed</p> <p>PUBS-ID-00023 Removed</p> <p>PUBS-ID-00106 Removed</p>	Data generation and ingestion systems need to be updated to no longer enforce the removed rules.
Modified the schematron rule for ensuring that a PUBS document has either a date posted or a date published. This was done by consolidating the context and updating the assertion tests based on that consolidation.	<p>Schematron</p> <p>PUBS-ID-00111</p>	Data generation and ingestion systems need to be updated to enforce the modified rule.
Added a rule to ensure that if a TDO contains a PUBS assertion, it also contains an IRM assertion.	<p>Schematron</p> <p>PUBS-ID-00113</p>	Data generation and ingestion systems need to be updated to properly enforce the new rule.

Change	Artifacts changed	Compatibility Notes
Updated the GUIDE id in the example files to comply with the updated regex in IRM-ID-00062. The updated rule ensures there are no additional characters before or after the id.	Examples	Data generation and ingest systems complying with the GUIDE id rules do not need to be updated.  Systems that were allowing invalid GUIDE ids will need to be updated to comply with the constraint rule.
PUBS is now designed to live inside of a TrustedDataObject resulting in splitting the PublicationsMetadata part and the DocumentBody part into two independent root nodes named IntelDocMetadata and IntelDoc respectably.	Schema Schematron	Data generation and ingest systems will have to be updated to handle the new TDO formatted PUBS instances.
IRM removed from PublicationsMetadata and now resides in its own peer assertion in a TrustedDataObject.	Schema Schematron	Data generation and ingestion systems need to be updated to ensure they are properly using the new structures.
DDMS resides in its own assertion in a TrustedDataObject separate from IRM so Xpaths in Schematron rules had to be updated.	Schematron	Data generation and ingestion systems need to be aware of the changes.

Change	Artifacts changed	Compatibility Notes
Removed rules found to be duplicative of rules in or belonging to IRM.	PUBS-ID-00056 Removed  PUBS-ID-00057 Removed  PUBS-ID-00058 Removed  PUBS-ID-00059 Removed  PUBS-ID-00060 Removed  PUBS-ID-00061 Removed  PUBS-ID-00074 Removed  PUBS-ID-00086 Removed  PUBS-ID-00089 Removed	
Updated Mime Types to current IANA list + DNI types +application/x-autocad.	CVEnumPubsMimeType	Data generation and ingest systems will have to be updated to handle the new mime values.
Added @identifierType to both pubs:Identifier and pubs:InfoBearer.	Schema  CVEnumPubsIdentifier-Type	Data generation and ingest systems will have to be updated to handle the existence of new attributes.
Version decoupling, allowing import of any version of ISM and other dependent specifications at or above ISM v9+, NTK v7+, ARH v1+, and EDH v1+.	DES	Data ingestion systems need to be aware of this change and ensure they check appropriate dependent spec versions for validation.
Updated Schema to ISM v10.	Schema	Updated the Schema itself to use ism:DESVersion to 10 to mark the xsd schema instance with classification markings.

Change	Artifacts changed	Compatibility Notes
Removed support for CVEnum-PubsCountryFIPSDigraph.xml.	Schema Changed  PUBS-ID-00071 Removed  CVEnumPubsCountry-FIPSDigraph Removed	Data generation and ingest systems will have to be updated to support the current CVE values.
Removed ORCON POC related rules as ISM.XML.V10 removed ORCON POC.	Schematron  PUBS-ID-00102 Removed	Data generation and ingestion systems need to be updated to no longer use rule
Updated to use VIRT instead of IC Common for virtual coverage concepts.	Schematron  PUBS-ID-00037 Removed  PUBS-ID-00038 Removed  PUBS-ID-00039 Removed  Schema  updated to use VIRT instead of IC Common NetworkAttributesGroup and link attributes groups	Data generation and ingestion systems need to be updated to no longer use these rules, and to expect VIRT instead of IC Common for virtual coverage concepts including: NetworkAttributesGroup, SimpleOrResourceLinkAttributesGroup, SimpleOrExtendedLinkAttributesGroup, SimpleLinkAttributesGroup, RequiredSimpleLinkAttributesGroup, OptionalResourceLinkAttributesGroup.
Added Cabinet Offices to CVEnum-PubsAgencyAcronym.	CVE	Data generation and ingestion systems need to be updated to use the correct CVE definitions and values.

## B.6 - V10 Change Summary

Significant drivers for Version 10 include:

- See ISM V9 drivers
- CMSTT for IRM in PUBS
- See ADD V3 drivers

The following table summarizes the changes made to V9 in developing V10.

**Table 15 - Data Encoding Specification V10 Change Summary**

<b>Change</b>	<b>Artifacts changed</b>	<b>Compatibility Notes</b>
Updated ISM to V9, NTK to V7, IRM to V8.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.

Change	Artifacts changed	Compatibility Notes
Replace most of PUBS metadata with IRM.	Schema	Data generation and ingestion systems need to be updated to ensure they are properly using the new structures.
	PUBS-ID-00001 Changed	
	PUBS-ID-00003 Changed	
	PUBS-ID-00007 Removed	
	PUBS-ID-00015 Changed	
	PUBS-ID-00018 Removed	
	PUBS-ID-00019 Removed	
	PUBS-ID-00020 Changed	
	PUBS-ID-00021 Changed	
	PUBS-ID-00022 Changed	
	PUBS-ID-00023 Changed	
	PUBS-ID-00024 Changed	
	PUBS-ID-00026 Removed	
	PUBS-ID-00029 Changed	
	PUBS-ID-00039 Changed	
	PUBS-ID-00040 Changed	
	PUBS-ID-00041 Changed	

Change	Artifacts changed	Compatibility Notes
	PUBS-ID-00045 Changed	
	PUBS-ID-00046 Changed	
	PUBS-ID-00047 Changed	
	PUBS-ID-00048 Changed	
	PUBS-ID-00049 Changed	
	PUBS-ID-00050 Changed	
	PUBS-ID-00053 Changed	
	PUBS-ID-00054 Changed	
	PUBS-ID-00056 Changed	
	PUBS-ID-00057 Changed	
	PUBS-ID-00058 Changed	
	PUBS-ID-00059 Changed	
	PUBS-ID-00060 Changed	
	PUBS-ID-00061 Changed	
	PUBS-ID-00065 Changed	
	PUBS-ID-00066 Removed	
	PUBS-ID-00068 Removed	



Change	Artifacts changed	Compatibility Notes
	PUBS-ID-00070 Changed	
	PUBS-ID-00074 Changed	
	PUBS-ID-00079 Changed	
	PUBS-ID-00087 Changed	
	PUBS-ID-00088 Changed	
	PUBS-ID-00089 Changed	
	PUBS-ID-00090 Changed	
	PUBS-ID-00091 Removed	
	PUBS-ID-00094 Removed	
	PUBS-ID-00105 Added	
	PUBS-ID-00106 Added	
	PUBS-ID-00107 Added	
	PUBS-ID-00108 Added	
	PUBS-ID-00108 Removed	
	PUBS-ID-00109 Added	
	PUBS-ID-00110 Added	
	PUBS-ID-00111 Added	
	CVEnumPubsCoverage- FIPSDigraph Removed	
	CVEnumPubsCoverage- ISO3166Trigraph Removed	

Change	Artifacts changed	Compatibility Notes
	CVEnumPubsIntelSub-disciplines Removed  CVEnumPubsIntelSub-disciplineTechniques Removed	
Update mapping to ADD.	DES	Should not impact data.
Added support for alphanumeric <b>@DESVersion</b> identifiers [artf12167].	Schema	Should not impact data but ingestion systems may need to account for it.
Changed <b>Language/@encoding</b> to be a required attribute.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Updated PUBS-ID-00082 to allow <code>ism:noticeType</code> to be used on <code>AuthorInfo</code> , <code>CoauthorInfo</code> , <code>ContributingAuthorInfo</code> , and <code>POCinfo</code> in addition to the existing <code>IntelDoc</code> , <code>Note</code> , <code>NoteInline</code> . [artf12263]	Schematron	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Updated PUBS-ID-00102 to only fire when <code>ism:noticeType</code> is used on <code>AuthorInfo</code> , <code>CoauthorInfo</code> , <code>ContributingAuthorInfo</code> , and <code>POCinfo</code> . [artf12234]	Schematron  PUBS-ID-00102 Added	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Updated schema to no longer require <code>pubs:QuantityReference</code> on <code>pubs:Money</code> . [artf12264]	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Updated several rules to handle multiple occurrences of text objects such as phone numbers.	PUBS-ID-00065 Changed  PUBS-ID-00102 Changed  PUBS-ID-00105 Changed	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.

## B.7 - V9 Change Summary

Significant drivers for Version 9 include:

- See ISM V8 drivers
- CMSTT for AudienceVariation changes

- NIEM

The following table summarizes the changes made to V8 in developing V9.

**Table 16 - Data Encoding Specification V9 Change Summary**

Change	Artifacts changed	Compatibility Notes
Updated ISM to V8, NTK to V6, IRM to V7.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Added unique namespaces to generated CVE schema fragments. Moved schema fragment imports to the base schema.	Schema CVEs	Should not affect data.
Removed CVEGenerated schema import from and moved schema fragment imports directly to the base schema.	Schema	Impacts schema designers only. Instance documents do not change.
Added unique namespaces to generated CVE schema fragments. Moved schema fragment imports to the base schema.	Schema CVEs	Should not affect data.
Updated definitions for DateTimeReferenced and DateInformation [artf7487].	Schema	Data generation and ingestion systems need to be updated to ensure they are properly using DateTimeReferenced and DateInformation based on the clarified definitions.
Changed Note to not allow mixed content.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new structure.
Removed PUBS-ID-00043 so times are no longer constrained to 3 decimal places.	PUBS-ID-00043	Data generation and ingestion systems need to be updated to properly handle the greater precision now possible.
Added Classification to Audience Variation and AlternateFormatType.	Schema	Data generation and ingestion systems need to be updated to properly handle the security markings on the links.
Updated PUBS-ID-00008 to allow for documents starting with a Section to be valid.	PUBS-ID-00008	Data generation and ingestion systems need to be updated to properly handle the new structures now possible.

Change	Artifacts changed	Compatibility Notes
Added PUBS-ID-00104 to verify a source citation exists on USA documents with Foreign Government Information (FGI).	PUBS-ID-00104	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.

## B.8 - V8 Change Summary

Significant drivers for Version 8 include:

- DDMS and IRM Harmonization
- CMSTT for several new elements

The following table summarizes the changes made to V7 in developing V8.

**Table 17 - Data Encoding Specification V8 Change Summary**

Change	Artifacts changed	Compatibility Notes
Updated <b>ProductionMetricsList</b> , <b>ProcessingInfoList</b> , <b>Order-AttributeGroup</b> , <b>NonStateActor-CoverageList</b> , <b>RecordsManagementInfo</b> , <b>RecordKeeper</b> , and <b>subDivisionCode</b> to properly reference harmonized IRM/DDMS 4.0 elements and attributes.	Schema Constraint Rules	Data generation and ingestion systems need to be updated to comply with all constraint rules in these sub-specifications as well as schema changes.
Updated IRM to V6 and DDMS <sup>[4]</sup> to V4.0.1.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
Created <b>@decimalDegreeCoordinates</b> attribute in <b>coordinatesAttribute-Group</b> and added the group to <b>GeoRef</b> , <b>GeoFeature</b> , <b>CountryName</b> , <b>CityName</b> , <b>LocationOfInterest</b> , and <b>Facility</b> .	Schema	Data generation and ingestion systems need to be updated to handle the new optional attribute group.
Corrected the Equation element's definition to the V5 format. V6 had introduced an error.	Schema	Data generation and ingestion systems need to be updated to handle the corrected definition.

Change	Artifacts changed	Compatibility Notes
Modified rule PUBS-ID-00001: removed ddms:countryCode, added ddms:NonStateActor.	PUBS-ID-00001 Changed	Data generation and ingestion systems need to be updated to use the new values.  Note: Data generated under previous releases may not be valid under this release.

## B.9 - V7 Change Summary

Significant drivers for Version 7 include:

- See ISM V7 drivers
- ISO 3166-1<sup>[31]</sup>
- DNI ORCON Memo<sup>[38]</sup>
- CMSTT for several new elements
- XLink 1.1<sup>[45]</sup>
- Joint Chiefs of Staff Pub 2.0: Appendix B - Intelligence Disciplines<sup>[35]</sup>

The following table summarizes the changes made to V6 in developing V7.

**Table 18 - Data Encoding Specification V7 Change Summary**

Change	Artifacts changed	Compatibility Notes
Updated ISM to V7, IRM and NTK to V5.	Schema Constraint Rules	Data generation and ingestion systems need to be updated to comply with all constraint rules in these sub-specifications.
Updated the regular expression defining <b>dateTimePairsType</b> to ensure validation in a wider set of XML editors.	Schema	Should not impact data since intent of the new expressions are the same.
Replaced "\d" in regular expressions to the more specific "[0-9]."	Schema Constraint Rules	Should not impact data since intent of the new expressions is the same.
Moved ODNI specific XLink attribute groups from IC-XLink schema to IC-Common.	Schema	Should not impact data.

Change	Artifacts changed	Compatibility Notes
Replaced references to <b>irm:NoticeList</b> to new <b>NoteList</b> element to allow child element <b>Note</b> to represent security notices similar to the <b>ism:NoticeList</b> elements. <b>Note</b> was changed to have child elements in <b>BlockObjectsGroup</b> and attributes in <b>ISMNotice-AttributeGroup</b> and <b>POC-AttributeGroup</b> .	Schema PUBS-ID-00001 Changed	Data generation and ingestion systems need to be updated to use the new values.  Note: Data generated under previous releases may not be valid under this release.
Added <b>CityName</b> with attribute <b>@category</b> and <b>TransportationNetwork</b> elements to <b>RunningTextType</b> to add to the set of Geo-locational markup objects. The <b>@category</b> attribute has a controlled vocabulary.	Schema CVCEnum- PubsCityCategory Added	Data generation and ingestion systems need to be updated to use the new values.
Added <b>SecurityAttributes-OptionsGroup</b> to the <b>SourcedText</b> element.	Schema	Data generation and ingestion system need to be updated to use the new attributes.
Updated XLink <a href="#">[45]</a> to version 1.1, which further restricts the types of certain attributes and added xlink constraint rules.	PUBS-ID-00096 Added PUBS-ID-00097 Added PUBS-ID-00098 Added PUBS-ID-00099 Added PUBS-ID-00100 Added PUBS-ID-00101 Added	Data generation and ingestion system need to be updated to use the new rules.  Note: Data generated under previous releases may not be valid under this release.
Allowed ISM Notice Attributes on the <b>IntelDoc</b> element.	PUBS-ID-00082 Changed	Data generation and ingestion system need to be updated to use the new rules.
Added new <b>PersonalProfileType</b> to define elements in the <b>PersonalProfileGroup</b> , as well as the <b>CommonAttributesGroup</b> and <b>SecurityAttributesGroup</b> ; Affects <b>Addressee</b> and <b>RequestorInfo</b> .	Schema	Should not impact data as the elements and attributes defined in the new type are the same as those that were previously defined.

Change	Artifacts changed	Compatibility Notes
Added support for ORCON memos and points-of-contact by extending <b>PersonalProfileType</b> to include <b>ism:POCAttributesGroup</b> ; affects elements <b>Note</b> , <b>AuthorInfo</b> , <b>CoauthorInfo</b> , <b>POCinfo</b> and <b>ContributingAuthorInfo</b> .	Schema PUBS-ID-00102 Added	Data generation and ingestion systems need to be updated to use the new values and comply with the new constraint rules.  Note: Data generated under previous releases may not be valid under this release.
Restricted <b>CommData/@commDataType</b> with a controlled vocabulary enumeration.	Schema	Data generation and ingestion systems need to be updated to use the new values.  Note: Data generated under previous releases may not be valid under this release.
Fixed type errors generated when using a schema-aware processor.	Constraint Rules	Should not affect data.
Added <b>DateReceived</b> element to track when a product is received from an external source.	Schema PUBS-ID-00040 Changed  PUBS-ID-00043 Changed  PUBS-ID-00054 Changed	Data generation and ingestion systems need to be updated to use the new values and adhere to the new rules.
Referenced <b>irm:ProcessingInfoList</b> element from <b>AdministrativeMetadata</b> to track when a product is modified post-production.	Schema	Data generation and ingestion systems need to be updated to use the new values.
Changed references to attribute <b>@ism:notice</b> to reference the <b>ism:ISMNoticeAttributeGroup</b> instead to allow full conformance with ISM rules.	Schema	Data generation and ingestion systems may need to be updated to use the now available notice attributes.
Updated Intelligence Discipline and Subdiscipline CVE values in accordance with JP 2-0: Joint Intelligence <sup>[35]</sup> .	CVEnumPubsIntel Disciplines.xml, CVEnumPubsIntel SubDisciplines.xml	Data generation and ingestion systems need to be updated to use the updated CVE values.

Change	Artifacts changed	Compatibility Notes
Added rule that prevents <b>@noteType</b> from being applied to an element with <b>@ism:noticeType</b> or <b>@ism:unregisteredNoticeType</b> .	PUBS-ID-00193 Added	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.
Added country code for South Sudan to the ISO 3166-1 <sup>[31]</sup> CVEs.	CVEnumISMFGIOpen Changed  CVEnum-ISMFGIProtected Changed  CVEnum-ISMOwnerProducer Changed  CVEnumISMRelTo Changed	Data generation and Ingestion systems need to be updated to properly use the new values.

## B.10 - V6 Change Summary

Significant drivers for Version 6 include:

- See ISM V6 drivers
- ISO 3166-1<sup>[31]</sup>
- National HUMINT Director for several new markups

The following table summarizes the changes made to V5 in developing V6.

**Table 19 - Data Encoding Specification V6 Change Summary**

Change	Artifacts changed	Compatibility Notes
Change encoding of constraint rules from text to Schematron.	Documentation  Constraint Rules	Other than rules whose changes are noted below this should only result in more clarity of definition for the rules.
Use ISM.XML.V6 and IRM.XML.V4.	Schema	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.



Change	Artifacts changed	Compatibility Notes
Remove support for ISO 3166-1 <sup>[31]</sup> Numeric codes.	PUBS-ID-00069 Removed  PUBS-ID-00073 Removed  CVENumPubsCountry-ISO3166Numeric Removed  CVENumPubsCoverage-ISO3166Numeric Removed	Data generation and Ingestion systems need to be updated to not use these values anymore and to properly enforce only the remaining constraint rules.
Remove support for ISO 3166-1 <sup>[31]</sup> Digraph codes.	PUBS-ID-00067 Removed  CVENumPubsCountry-ISO3166Digraph Removed	Data generation and Ingestion systems need to be updated to not use these values anymore and to properly enforce only the remaining constraint rules.
Remove element <b>DateInformation</b> from PUBS-ID-00054.	PUBS-ID-00054 Changed	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.
Replaced PUBS-ID-00002 and PUBS-ID-00016 with PUBS-ID-00093.	Documentation  PUBS-ID-00002 Removed  PUBS-ID-00016 Removed  PUBS-ID-00093 Added	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Element <b>DateString</b> must have content.	PUBS-ID-00003 Changed	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.
Remove PUBS-ID-00011.	PUBS-ID-00011 Removed	Data generation and Ingestion systems need to be updated to properly enforce only the remaining constraint rules.

Change	Artifacts changed	Compatibility Notes
Update ISO 3166-1 <sup>[31]</sup> Trigraph CVEs.	CVEnumPubsCountry-ISO3166Trigraph Changed  CVEnumPubsCoverage-ISO3166Trigraph Changed	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Update ISO 3166-1 <sup>[31]</sup> Digraph CVEs.	CVEnumPubsCoverage-ISO3166Digraph Changed	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Update FIPS Digraph CVEs.	CVEnumPubsCountry-FIPSDigraph Changed  CVEnumPubsCoverage-FIPSDigraph Changed	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Added support for <b>irm:SubCountryCode</b> to further refine the <b>pubs:CountryCode</b> element.	Documentation  Schema  PUBS-ID-00001 Changed  PUBS-ID-00095 Added	Data generation and Ingestion systems need to be updated to use the values and properly enforce the new constraint rules.
Added <b>irm:CountryCode</b> , <b>irm:SubCountryCode</b> , and <b>irm:NonStateActor</b> to check for non-null values.	PUBS-ID-00001 Changed	Data generation and Ingestion systems need to be updated to properly enforce the revised constraint rules.
Added support for <b>irm:order</b> attribute to define a sequential ordering of <b>pubs:CountryCode</b> elements.	Documentation  Schema  PUBS-ID-00094 Added	Data generation and Ingestion systems need to be updated to use the values and properly enforce the new constraint rules.
Remove constraints related to <b>@compliesWith</b> ICD 710 <sup>[18]</sup> .	PUBS-ID-00085 Removed	Data generation and Ingestion systems need to be updated to no longer enforce this constraint.

## B.11 - V5 Change Summary

Significant drivers for Version 5 include:

- See ISM V5 drivers
- CMSTT for new markup
- National HUMINT Director for several new markups

The following table summarizes the changes made to V4 in developing V5.

**Table 20 - Data Encoding Specification V5 Change Summary**

Change	Artifacts changed	Compatibility Notes
Use ISM V5	Schema	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.
Create Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.  Note: Data valid under previous releases may not be valid under this release.
Create Attachments.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Create <b>DateAcquired</b> .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Update MIME Types.	CVE	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Update <b>DateInfoCutoff</b> to use Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Create support for <b>CollectionSource</b> .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.

Change	Artifacts changed	Compatibility Notes
<b>Coverage/Temporal</b> modified to use an approximable date.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Update <b>DateInformation</b> to use Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the values.  Note: Data valid under previous releases may not be valid under this release.
Remove Appendix H Reading the Schematics.	Documentation	Knowledge of how to interpret these schema images is common making this appendix unnecessary.
Add support for expressing coverage of NonState Actors.	Documentation Schema	Data generation and Ingestion systems need to be updated to properly support new elements.

## B.12 - V4 Change Summary

Significant drivers for Version 4 include:

- See ISM V4 drivers
- ASEC for Production Metrics
- CMSTT for new markup

The following table summarizes the changes made to V3 in developing V4.

**Table 21 - Data Encoding Specification V4 Change Summary**

Change	Artifacts changed	Compatibility Notes
Change to use ISM V4.	Documentation  PUBS-ID-00085	See ISM change notes for Impacts.  Note: Data valid under previous releases will not be valid under this release.
Included <b>irm:ProductionMetricsList</b> .	Documentation Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately.

Change	Artifacts changed	Compatibility Notes
Eliminate NIPF.	Documentation Schema PUBS-ID-00004	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.
Refactor to single root element <b>IntelDoc</b> .	Documentation Schema PUBS-ID-00008	Data generation and Ingestion systems need to be updated to use the new structures.
Use schema to enforce DES version number.	Schema PUBS-ID-00077 PUBS-ID-00078 PUBS-ID-00083 PUBS-ID-00084	Data Ingestion systems need to be updated to use the new schema instead of constraint rules.
Implemented <b>PublicationMetadataList</b> to allow for multiple metadata descriptions of the document body.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Implemented <b>DocumentBody</b> as a container for front and rear matter as well as the <b>ComplexObject</b> Group that contains the main document body.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Removed <b>Security</b> Element from <b>DescriptiveMetadata</b> .	Schema	Data generation and Ingestion systems need to be updated to the root node as the Resource security element.
Applied Resource Security to root node <b>IntelDoc</b> .	Schema	Data generation and Ingestion systems need to be updated to the root node as the Resource security element.
Remove references to NIPF.	PUBS-ID-00003 PUBS-ID-00004	Data Ingestion systems need to be updated to reflect the rule changes.
Require classification of each <b>PublicationMetatdata</b> when there are multiple.	Documentation PUBS-ID-00086	Data generation and Ingestion systems need to be updated to use the new structures.
Add <b>NoticeList</b> .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.

Change	Artifacts changed	Compatibility Notes
Replace <b>Narcotic</b> with <b>Drug</b> .	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
Added <b>irm:RecordKeeper</b> to <b>RecordsManagmentInfo</b> .	Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately. Note: this element is only required if its parent, RecordsManagementInfo, is used. Data generation and Ingestion systems need to be updated to use the new structures.

## B.13 - V3 Change Summary

Significant drivers for Version 3 include:

- See ISM V3 drivers
- Executive Order 13526<sup>[8]</sup>
- NTK needs from LNI
- ASEC for Production Metrics
- CAPCO Register and Manual <sup>[3]</sup>

The following table summarizes the changes made to V2 in developing V3.

**Table 22 - Data Encoding Specification V3 Change Summary**

Change	Artifacts changed	Compatibility Notes
Change to use ISM V3.	Documentation Constraint Rules	See ISM change notes for Impacts.  Note: Data could have been created that was valid under previous releases that may not be valid under this release.
Update references to E.O. 12958, as amended <sup>[7]</sup> to refer to E.O. 13526. <sup>[8]</sup>	Documentation	Should not impact data.

Change	Artifacts changed	Compatibility Notes
Added reference to NTK.XML.	Documentation PUBS-ID-00083	Existing data remain valid. Systems need to be modified to accept and process new data.
Included <b>irm:ProductionMetricsList</b> .	Documentation Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately.
Added constraint to ensure <b>ism:notice</b> is only used where allowed.	PUBS-ID-00082	Existing data remain valid. Systems need to be modified to accept and process new data.

## B.14 - V2 Change Summary

Significant drivers for Version 2 include:

- See ISM V2 drivers
- DNI Revision Recall Memo<sup>[5]</sup>
- ICD 206<sup>[13]</sup>
- DDMS Changes

The following table summarizes the changes made to V1 in developing V2.

**Table 23 - Data Encoding Specification V2 Change Summary**

Change	Artifacts changed	Compatibility Notes
Various changes to documentation.	Documentation Schema	Changes were to correct errors. Any system that relied on the incorrect information may need to be modified.
Removed version number from file names.	Schema	Data generation and ingestion systems need to be updated to use the new file names.
Added ability for instance documents to specify the DES version used for the document.	Schema Constraint Rules	Data generation systems need to be updated to use the new feature. Ingestion systems need to be updated to properly handle the new data.

Change	Artifacts changed	Compatibility Notes
Changed default namespace.	Schema	Data generation systems need to be updated to use the new namespace. Ingestion systems need to be updated to properly handle the new data.
Added support for Revision/Recall identification.	Schema Constraint Rules	Data generation systems should be updated to use the new structures if they need the feature. Ingestion systems need to use the new specification, including schema and constraints rules. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
Updated reference to DDMS <sup>[4]</sup> to use version 2.0.	Schema	Data generation systems should be updated to use the new structures if they need the feature. Ingestion systems need to use the new specification, including schema. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
Updated DES to support ICD 206 <sup>[13]</sup> source citations.	Schema Constraint Rules Controlled Value Enumerations	Data generation systems need to be updated to use the new feature. Ingestion systems need to be updated to properly handle the new data. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
Relaxed XML schema for <b>PersonalProfileGroup</b> and replaced with constraint rules.	Schema Constraint Rules	Any system relying solely on the XML schema for validation of PersonProfileGroup may need to be modified to ensure that data are processed appropriately.



Change	Artifacts changed	Compatibility Notes
Specified and/or update values for numerous elements and attribute to allow more specific validation of data.	Schema Constraint Rules Controlled Value Enumerations	All systems can now use the specified values to ensure data are correct. Note: Data could have been created that was valid under previous releases that may not be valid under this release.

## Appendix C List of Abbreviations

This appendix lists all the acronyms and abbreviations referenced in this encoding specification.

ADD	Abstract Data Definition
ARC	Appended Reference Citation
ARH	Access Rights and Handling
CAPCO	Controlled Access Program Coordination Office
CMSTT	Common Metadata Standards Tiger Team
CVE	Controlled Vocabulary Enumeration
DDMS	Department of Defense Discovery Metadata Specification
DES	Data Encoding Specification
DNI	Director of National Intelligence
EDH	Enterprise Data Header
ESB	Enterprise Standards Baseline
FGI	Foreign Government Information
FIPS	Federal Information Processing Standards
FOUO	For Official Use Only
GENC	Geopolitical Entities, Names, and Codes
GUIDE	Globally Unique Identifiers for Everything
HTML	HyperText Markup Language
HUMINT	Human Intelligence
IANA	Internet Assigned Numbers Authority
IC	Intelligence Community
IC CIO	Intelligence Community Chief Information Officer
IC EA	Intelligence Community Enterprise Architecture
IC ESB	Intelligence Community Enterprise Standards Baseline
IC ITE	Intelligence Community Information Technology Enterprise
IC-ID	IC Identifier

ICD	Intelligence Community Directive
ICPM	Intelligence Community Policy Memorandum
ICS	Intelligence Community Standard
IETF	Internet Engineering Task Force
INTDIS	Intelligence Discipline
IRM	Information Resource Metadata
ISM	Information Security Markings
ISMCAT	Information Security Marking Country Codes and Tetragraphs
ISO	International Organization for Standardization
IT	Information Technology
LIC	License
LNI	Library of National Intelligence
MIME	Multipurpose Internet Mail Extensions
MN	Mission Need Profile
NIPF	National Intelligence Priorities Framework
NIEM	National Information Exchange Model
NTK	Need-To-Know Metadata
OCIO	Office of the Intelligence Community Chief Information Officer
ODNI	Office of the Director of National Intelligence
PAYL	Payload
PM	Production Metrics
PUBS	Intelligence Publications
RFC	Request for Comments
SRC	Source Reference Citation
TDF	Trusted Data Format
TDO	Trusted Data Object
USAGENCY	Controlled Vocabulary Enumeration Encoding Specification for US Agencies

URL	Uniform Resource Locator
VIRT	Virtual Coverage
W3C	World Wide Web Consortium
XHTML	eXtensible Hyper-Text Markup Language
XLink	XML Linking
XML	Extensible Markup Language
XPath	XML Path Language
XSL	Extensible Stylesheet Language
XSLT	XSL Transformations

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## Appendix E Points of Contact

The Intelligence Community Chief Information Officer (IC CIO) facilitates one or more collaboration and coordination forums charged with the adoption, modification, development, and governance of IC technical specifications of common concern. This technical specification was produced by the IC CIO and coordinated with these forums, approved by the IC CIO or a designated representative, and made available at the following DNI-sponsored web sites.

Public Website: <https://w3id.org/ic/standards/public>

Intelshare: <https://w3id.org/ic/standards/data-specs>

Direct all inquiries about this IC technical specification, IC technical specification collaboration and coordination forums, or IC element representatives involved in those forums, to the IC CIO.

E-mail: [ic-standards-support@iarpa.gov](mailto:ic-standards-support@iarpa.gov).

## Appendix F IC CIO Approval Memo

An Office of the Intelligence Community Chief Information Officer (OCIO) Approval Memo should accompany this enterprise technical data specification bearing the signature of the Intelligence Community Chief Information Officer (IC CIO) or an IC CIO-designated official(s). If an OCIO Approval Memo is not accompanying this specification's version release package, then refer back to the authoritative web location(s) for this specification to see if a more complete package or a specification update is available.

Specification artifacts display a date representing the last time a version's artifacts as a whole were modified. This date most often represents the conclusion of the IC Element collaboration and coordination process. Once the IC Element coordination process is complete, the specification goes through an internal OCIO staffing and coordination process leading to signature of the OCIO Approval Memo. The signature date of the OCIO Approval Memo will be later than the last modified date shown on the specification artifacts by an indeterminable time period.

Upon signature of the OCIO Approval Memo, IC Elements may begin to use this specification version in order to address mission and business objectives. However, it is critical for IC Elements, prior to disseminating information encoded with this new specification version, to ensure that key enterprise services and consumers are prepared to accept this information. IC Elements should work with enterprise service providers and consumers to orchestrate an orderly implementation transition to this specification version in concert with mandatory and retirement usage decisions captured in the IC Enterprise Standards Baseline as defined in Intelligence Community Standard (ICS) 500-20.<sup>[21]</sup>