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TO: Director, Freedom of Information & Security Review, Rm. 2C757, Pentagon

1. DOCUMENT DESCRIPTION
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3. PRESENTATION/PUBLICATION DATA (Date, Place, Event)
The DoD M&S Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) defines Discovery Metadata elements for M&S resources posted to community and organizational shared spaces. The MSC-DMS is a concise, practical, and flexible specification for Discovery Metadata to be used across the Communities and Services for tagging M&S assets that will be made accessible via the Global Information Grid (GIG). All activities that publish the availability of M&S assets will need to use the MSC-DMS so that federated searches across the GIG will provide consistent discovery of resources.

Request for clearance for public release: Distribution A will allow DoD M&S COI to continue to refine the MSC-DMS with review and input from internal organizations, as well as industry and academia.

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6. REMARKS
   1. Associated Specifications were cleared by OSR (v1.3 - case No. 10-S-1409; v1.1 case No. 08-S-2636; v1.2 case No. 09-S-2293; and v1.4 case No. 11-S-2706).
   2. The M&S CO offers technical assistance to any party participating in the Security Review process. Technical assistance can be obtained by contacting Mr. Frank Mullen, Associate Director, DoD Modeling and Simulation Coordination Office, 571-372-6787, Email: mssc.secretariat@osd.mil.
   3. The USD(AT&L), by charter (paras 3 & 3.35 of DoDD 5034.01), is responsible for all matters relating to DoD modeling and simulation. The M&S CO is the OSD office responsible for supporting the USD(AT&L) in the execution of his M&S responsibilities. We believe the information is unclassified and that it is ready for public release. From M&S CO’s perspective, the brief doesn’t violate any security concerns.

NOTE: Request scanned .pdf copy of OSR-stamped DD Form 1910 be sent to mscocpo@osd.mil. If the OSR-stamped hard copy is returned, please mail to POC in blocks 4a & 4b above at M&SCO, 4800 Mark Center Drive, Suite 16E08-06, Mailbox 46, Alexandria, VA 22350-3600.

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      Modeling & Simulation Coordination Office (M&SCO)
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Modeling and Simulation (M&S) Community of Interest (COI)
Discovery Metadata Specification (MSC-DMS)

Version 1.5

July 12, 2012

Department of Defense (DoD)
Modeling and Simulation Coordination Office (M&S CO)

Keywords: Accessibility, Cataloging, Discovery, Interoperability, Metadata, Modeling and Simulation, Reuse, Understandability, Visibility
Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS)

Version 1.5

July 12, 2012

Department of Defense (DoD) Modeling and Simulation Coordination Office (M&S CO)

Keywords: Accessibility, Cataloging, Discovery, Interoperability, Metadata, Modeling and Simulation, Reuse, Understandability, Visibility

The DoD Office of Security Review has cleared this document for public release (Distribution A) (Case No. 13-S-0429).
Forward

The Department of Defense (DoD) M&S Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) defines discovery metadata components for documenting M&S assets posted to community and organizational shared spaces. “Discovery” is understood as the ability to locate data assets through a consistent and flexible search. The MSC-DMS specifies a set of information fields that are to be used to describe M&S data or service assets that are made known to the Enterprise, and it serves as a reference for developers, architects, and engineers by building upon the foundation for Discovery Services initially reflected within the DoD Discovery Metadata Specification (DDMS). The DDMS and other standards, practices, and discovery approaches have been cross integrated to formulate this concise, practical, and flexible specification, which enables Discovery Metadata to be used across the Communities and Services for tagging M&S assets that will be made accessible via the Global Information Grid (GIG). All activities that publish the availability of M&S assets should use the MSC-DMS so that federated searches across the GIG will provide consistent discovery of assets including M&S Resources, M&S Contacts, and M&S Taxonomies.

This document is divided into two main sections. The first section (Chapters 1 through 3) provides information about the scope, purpose, logical structure and organization of the MSC-DMS. The second section (Chapters 4 through 8) contains a comprehensive listing of each of the metadata components used to create MSC-DMS metacards. Additionally there are 4 appendices that include a references list, a definitions list, and a schema listing.

This document describes the MSC-DMS components and their logical groupings. It serves as an interchange specification for conveying discovery metadata. However, this document is not intended to offer substantive implementation guidance. An MSC-DMS Implementation Guide is provided as a companion to this specification document providing helpful examples and use cases for metadata practitioners. The MSC-DMS components as specified in this document provide a basis to assist M&S-focused organizations to begin planning, transitioning, and implementing metadata tagging initiatives that support the Department’s goal of increased data visibility and Enterprise Discovery.

The M&S CO is responsible for configuration management of the MSC-DMS, and continues to ensure consistency with the Department’s Net-Centric Data Strategy objectives. Through coordination with the M&S COI members in the form of a working group (WG), candidate additions and modifications will be identified for inclusion in subsequent versions of the M&S COI Discovery Metadata Specification.

Comments and suggestions pertaining specifically to the DoD M&S COI Discovery Metadata Specification should be sent to the following:

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Acknowledgments

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Change History

12 July 2012 - Version 1.5

This version updates the specification to conform more tightly to DDMS 4.0. As a result, the following changes are noted:

- MetacardInfo Element has been added to reflect the DDMS structure;
- The various Metadata Sets associated to the MSC-DMS have been reordered to match more closely with the DDMS order of components;
- The Associations component found in previous versions of the MSC-DMS has been replaced with the RelatedResources element inherited from DDMS;
- Additionally, the TaxonomiesCited element found in previous versions of the MSC-DMS has been renamed to RelatedTaxonomies to conform to DDMS;
- Additional Security Metadata Sets have been added to reflect the equivalent Security Metadata Sets used by DDMS 4.0;
- Media Metadata Set in MSC-DMS has been renamed to Source Metadata Set to maintain consistency with the DDMS. The Format Metadata Set, however, continues to be provided as a subcomponent to the Source Metadata Set, whereas it is a standalone component in the DDMS. Additionally, the location of a Source is provided though this metadata set;
- Configuration Management in MSC-DMS has been renamed to ResourceManagement to maintain consistency with the DDMS. It continues to be provided at the Supplemental Layer.

Version 1.5 also includes updates based on M&S community recommendations. These include the following improvements:

- The ability to capture User Ratings of a described asset;
- The “Source” field within the Taxonomy Metadata set was changed to “Reference” to avoid a name conflict with the Source field of the Resource Metadata set;
- The “TaxonomiesCited” element was renamed to “RelatedTaxonomies” to improve understanding and align more similarly with “RelatedResources” element leveraged from DDMS;
- POCs can now reference Contact Metacards as an option; and
- A new type of asset metacard (Workflow), which is a mechanism to identify the responsibilities, progression, states, and dates associated to the development of an asset.

24 December 2010 - Version 1.4

This version reorganizes the specification to include two new types of asset metacards (Contact and Taxonomy) and also Multicards, which captures multiple metacards. Significant feedback was received by the M&S community and resulting changes are marked with a star (★):

- Resource Metacards
  - consolidated into one section rather than across three sections.
the diagrams, which were previously presented in the Appendices, have been moved earlier into the corresponding Resource “metadata set” section to provide greater clarity of each metadata component set, and helps better organize the specification.

- **Contact Metacards ★**
  - added to specify how contact information can be defined that represents individuals such as subject matter experts (SMEs) and organizations. This is an extraction of the POC subcomponent of a Resource Metacard.

- **Taxonomy Metacards ★**
  - added to specify how taxonomy classifications may be defined that detail the glossary of terms pertaining to a domain or organization that may have been used to describe a Resource. Aids the Related Taxonomy subcomponent of a Resource Metacard.

- **Multicards**
  - added to provide a way to capture a collection of metacards (Resources, Contacts, and/or Taxonomies) as one file.

Additional changes to the MSC-DMS include the following:

- **Update of the Resource Metadata Set as follows:**
  - Modification of the enumerations for Resource Type, including renaming
    - “interface_specification” to “interface_model_specification” to more closely align with current M&S best practices.
    - “software_design_document” to “resource_document” to support the ability to use metacards for other resource related documents.

- **Update of the Association Metadata Set as follows:**
  - Reduction and extension of the enumerations for an Association Type to support broader relationships with other assets. The enumeration list now includes the following:
    - resource_asset
      - if an association is made to another resource, then that resource’s metacard, will specify the resource type (it no longer needs to be specified within the association type).
    - contact_asset
    - taxonomy_asset
    - support_asset

- **Update of the HLA Coverage Metadata Set as follows:**
  - eliminate “waiver” requirement, and
  - provide an additional HLA certification enumeration, which now includes, "yes," "no," or "waiver."

- **Glossary in Appendix B has been consolidated into one single table and additional terms have been included or updated to better reflect key terms used in the specification.**

- **Updates of the MSC-DMS have been made to more closely align with DDMS version 3.0**
  - The Person Metadata Set, which is used to support Contacts and Resource.POCs, now includes the following:
- Affiliation has been added as a subcomponent to match with DDMS. As a result, the Position subcomponent has been moved under Affiliation, and Org has been removed from Position since it is supported by Affiliation.
- The ID attribute changed to personID to stay consistent with the naming style (see Section 3.1), and more closely match with DDMS, which uses UserID. The intent is to include a prefix on all IDs as done for other Metadata Sets.
- Cardinality for Email, Phone number changed to optional to match with DDMS.
- Cardinality for Address, which is not supported by DDMS, changed from required to optional.
  - The Organization Metadata Set now includes the following:
    - Cardinality for Email, Phone number changed to optional to match with DDMS
    - Cardinality for Address, which is not supported by DDMS, changed from required to optional.
  - A Security subcomponent has been added to more of the Metadata Sets, which were not previously supported in prior versions of the DDMS but are now supported in Version 3.0 of the DDMS. Also, to be consistent with Metadata Sets within the MSC-DMS, Releasability and Description subcomponents were also included in this addition. The following Metadata Sets have been affected
    - Virtual Coverage
    - Temporal Coverage
    - Geospatial Coverage
    - HLA Coverage
    - VV&A Coverage
    - Configuration Management
  - Provision of a relaxed MSC-DMS schema components have been added to the specification package to assist those developing experimental and prototype metacards that may not be fully completed.

22 March 2010 - Version 1.3.1 (Community Release)

This version corrects pagination and formatting issues that existed in Version 1.3. In addition, a naming inconsistency pertaining to POC references has been resolved within the supporting XML schema representing this specification. No other technical impact resulted from these changes.

10 February 2010 - Version 1.3

This version includes updates to several enumerated data types, which can be assigned to some of the MSC-DMS attribute values. These changes include the following:
- Usage Application Domain Set (added “intelligence”)
- Date Type (Added “last_verified”)
- Association Qualifier (was open text field, added new pick-list which includes “URL”)

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Association Type (added new association types including “Subject Matter Expert”)  

In addition to these enumeration types, the following other adjustments have been made:  
• Formally added a capability to identify specific taxonomies for any MSC-DMS component  
• Modified and improved the VV&A Coverage Metadata Set extension/supplemental component  
• Guidance on how to mark a M&S Resource as “FOUO”  
• Several grammatical errors have also been corrected within the specification and schema, such as PostalCode, which was originally misspelled in the schema as PostcalCode.

9 September 2009 - Version 1.2.1 (Community Release)  

This version corrects a minor defect pertaining to the inclusion (import) of the DDMS XML schemas within only the MSC-DMS Core and Supplemental XML schemas that resulted in a namespace conflict for some XML parsers. The principal schema, MSC-DMS-v1.2, was not affected. Thus, any metacards developed using the original 1.2 version of the MSC-DMS XML schema need not be updated. However, the new MSC-DMS Core and Supplemental XML schemas files provided with the 1.2.1 version should be used to replace the prior 1.2 versions of these same XML schema files.

20 February 2009 - Version 1.2 (Community Release)  

This version incorporates the most recent update of the DDMS, version 2.0, and IC-IMS, version 2.1. The known impact is that the Source Format subcomponents (extent, and medium) are now optional as opposed to required. For additional changes pertaining to the DDMS, please examine the DDMS, Version 2.0 specification and its release notes. Updates to the IC-IMS include an additional attribute, identified as “derivativelyClassifiedBy”, which is used for further amplifying security characteristics pertaining to a Resource. This additional attribute is now available to users of the MSC-DMS.

Additionally, this version resolves several editorial issues including the following:  
a) spelling and grammatical mistakes,  
b) incorrect references to sections and example tables,  
c) incomplete examples, and  
d) style naming conventions that were inconsistent. (Specifically the enumeration list for associationTypeEnumerations was updated to match the style used by the typeValueEnumerations; in which underscores are used in place of spaces.)

Otherwise, functionally, this version of the MSC-DMS is equivalent to version 1.1.

27 August 2008 - Version 1.1 (Community Release)
This version integrates adjudicated and accepted comments submitted by an initial set of community of users. This community of users includes the DoD M&S Catalog Project team, which has indicated their desire to use the MSC-DMS to provide a common mechanism to reflect M&S Resources gathered and reflected from the various set of repositories available, such as the DoD Modeling and Simulation Resource Repository (MSRR), Navy MSRR, and Air Force MSRR. In addition several components of the MSC-DMS have migrated from standalone components to component sets represented with attribute values. This is to allow for easier extensibility of component nodes as changes may warrant in the future without compromising the integrity and validity of older XML instances, which were founded on version 1.1 or newer editions of this metadata specification. This version of the specification also maintains conformance with the DDMS, proving an extension of that work in support of M&S discovery.

The technical updates that have been made to support the DoD M&S Catalog project needs are identified in Table 1.

### Table 1 Summary of Changes to MSC-DMS for Version 1.1

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Component(s)</th>
<th>Belonging To</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rename</td>
<td>RelatedResources (from References)</td>
<td>Resource</td>
<td>Applicability is much broader than bibliographic references.</td>
</tr>
<tr>
<td>Add to pick-list</td>
<td>Role</td>
<td>Resource.POCs.POC</td>
<td>Allow ADS-Designator to support Authoritative Data Sources</td>
</tr>
<tr>
<td>Add</td>
<td>Type and Address</td>
<td>Resource.POCs.POC.Person.Email Resource.POCs.POC.Organization.Email</td>
<td>E.g., NIPR, SIPR, and JWICS addresses.</td>
</tr>
<tr>
<td>Add</td>
<td>Capabilities</td>
<td>Resource.Usages.Usage</td>
<td>E.g., AAW, ASW, SUW</td>
</tr>
<tr>
<td>Add</td>
<td>Configuration Management</td>
<td>Resource.Extensions</td>
<td>Include Type to identify, “User Group”, “CCB”, “Executive Steering Committee”, “None” and POC reference</td>
</tr>
<tr>
<td>Add</td>
<td>Accreditation (VV&amp;A) Type</td>
<td>Resource.Extensions</td>
<td>To support VV&amp;AVV&amp;C. Relates to work performed in conjunction with the DoD VV&amp;A Documentation Tool (DVDT).</td>
</tr>
<tr>
<td>Update</td>
<td>HLA Coverage</td>
<td>Resource.Extensions</td>
<td>Enhanced flexibility of HLA coverage and added Name component HLA FOM / SOM being used (if applicable)</td>
</tr>
</tbody>
</table>
21 January 2008 - Version 1.0.1 (Community Release)

Since the Version 0.8.1 draft release, several small yet significant items were identified, which are now rectified in this release. In addition to editorial updates, the following technical updates have been made:

- Extension of **Date.Type** for **Date Metadata Set**
- Extension of **History.Type** for History Metadata Set which is used by the Usage Metadata Set to now include greater information regarding History entry
- Addition of a **Relationship** field within the Reference Metadata Set
- Ability to tag **Security** attributes for a Resource Metadata Set

Specifically, it was found that a single date entry in the **Dates** component for Verification and Validation (V&V) and Accreditation are not sufficient. There may be many V&V activities with different dates and multiple accreditations since M&S Resources are validated and accredited in the context of a specific use.

Additionally, the Reference Metadata Set (now identified as the Association Metadata Set beginning in Version 1.1) of the metadata has been extended with a Relationship metadata component (now identified as an Association metadata component beginning in Version 1.1) to better represent hierarchy and organization. This metadata set allows for an M&S Resource to identify if an M&S Resource “is part of” a larger component set, and/or if the Resource “has a” set of one or more other subcomponents that should be identified as an assembly or project set. Also it provides a means to identify if an M&S Resource “is a type of” another component or Resource that maybe more common and understood.

Finally, there was a concern that Security should be addressed at the core level as opposed to the supplemental level. This issue has been addressed, and security, using the Intelligence Community Metadata Standard for Information Security Marking (IC-ISM) standard metadata components, is applied at the Resource level. This approach also follows closely with the DDMS style, with the exception that it is contained within its own Security Metadata Set rather than included with the attributes of various Metadata Sets. This allows Security to be clearly identified and parsed by tools and repositories.
13 September 2007 - Version 0.8.1 (Internal Draft Release)

Version 0.8, which had provided a lot of rationale for this specification, was split into two components: one representing a more concise specification, which is embodied by this version 0.8.1; and the other into a supplemental Study Report providing research details and rationale for the M&S COI (MSC) Discovery Metadata Specification that has been developed. Because much text was removed from the original 0.8 draft, key text has been inserted as necessary. This includes a new Terms of Reference section within the Introduction section, which was originally in the Rationale section, which Version 0.8 provided.

Additionally, the Date Metadata Set was extended with two more date types: Date V&V (verified and validated) and Date Accredited.

5 September 2007 - Version 0.8 (Preliminary Internal Review Version)

Version 0.8 draft represented the original preliminary review version of the MSC-DMS.
References

The list of documents referenced within this Specification is defined in Appendix D.

Definitions

Terms used in this Specification are defined in Appendix A.
## Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADS</td>
<td>Authoritative Data Source</td>
</tr>
<tr>
<td>ASD AT&amp;L</td>
<td>Assistant Secretary of Defense Acquisition, Technology, and Logistics</td>
</tr>
<tr>
<td>ASD NII</td>
<td>Assistant Secretary of Defense Networks &amp; Information Integration</td>
</tr>
<tr>
<td>BOM</td>
<td>Base Object Model</td>
</tr>
<tr>
<td>COI</td>
<td>Community of Interest</td>
</tr>
<tr>
<td>DAMSMP</td>
<td>DoD Acquisition Modeling and Simulation (M&amp;S) Master Plan</td>
</tr>
<tr>
<td>DCMI</td>
<td>Dublin Core Metadata Initiative</td>
</tr>
<tr>
<td>DDMS</td>
<td>DoD Discovery Metadata Specification</td>
</tr>
<tr>
<td>DIF</td>
<td>Data Interchange Format</td>
</tr>
<tr>
<td>DIS</td>
<td>Distributed Interactive Simulation</td>
</tr>
<tr>
<td>DISA</td>
<td>Defense Information Systems Agency</td>
</tr>
<tr>
<td>DISR</td>
<td>DoD Information Technology Standards Registry</td>
</tr>
<tr>
<td>DoD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DODD</td>
<td>Department of Defense Directive</td>
</tr>
<tr>
<td>DOT&amp;E</td>
<td>Director of Operational Test and Evaluation</td>
</tr>
<tr>
<td>DT&amp;E</td>
<td>Developmental Test and Evaluation</td>
</tr>
<tr>
<td>DTIC</td>
<td>Defense Technical Information Center</td>
</tr>
<tr>
<td>EXCIMS</td>
<td>Executive Council for Modeling and Simulation</td>
</tr>
<tr>
<td>FEDEP</td>
<td>Federation Development and Execution Process</td>
</tr>
<tr>
<td>FOM</td>
<td>Federation Object Model</td>
</tr>
<tr>
<td>GIG</td>
<td>Global Information Grid</td>
</tr>
<tr>
<td>HLA</td>
<td>High Level Architecture</td>
</tr>
<tr>
<td>IC-ISMS</td>
<td>Intelligence Community Metadata Standard for Information Security Marking</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers, Inc.</td>
</tr>
<tr>
<td>IP</td>
<td>Intellectual Property</td>
</tr>
<tr>
<td>IP (Internet Protocol)</td>
<td></td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
</tr>
<tr>
<td>JDS</td>
<td>Joint Data Support</td>
</tr>
<tr>
<td>M&amp;S</td>
<td>Modeling and Simulation</td>
</tr>
<tr>
<td>M&amp;S CO</td>
<td>Modeling and Simulation Coordination Office</td>
</tr>
<tr>
<td>MSC-DMS</td>
<td>Modeling and Simulation COI Discovery Metadata Specification</td>
</tr>
<tr>
<td>MSRR</td>
<td>Modeling and Simulation Resource Repository</td>
</tr>
<tr>
<td>MWG</td>
<td>Metadata Working Group</td>
</tr>
<tr>
<td>OMT</td>
<td>Object Model Template</td>
</tr>
<tr>
<td>OSD</td>
<td>Office for the Secretary of Defense</td>
</tr>
<tr>
<td>PDMS</td>
<td>Product Development Metadata Specification</td>
</tr>
<tr>
<td>PM</td>
<td>Program Manager</td>
</tr>
<tr>
<td>POCs</td>
<td>Points of Contact</td>
</tr>
<tr>
<td>SDEM</td>
<td>Simulation Data Exchange Model</td>
</tr>
<tr>
<td>SISO</td>
<td>Simulation Interoperability Standards Organization</td>
</tr>
<tr>
<td>SOA</td>
<td>Service Oriented Architecture</td>
</tr>
<tr>
<td>SOM</td>
<td>Simulation Object Model</td>
</tr>
<tr>
<td>TENA</td>
<td>Test and Evaluation Enabling Architecture</td>
</tr>
<tr>
<td>T&amp;E</td>
<td>Test and Evaluation</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
</tr>
<tr>
<td>URN</td>
<td>Uniform Resource Name</td>
</tr>
<tr>
<td>VV&amp;A</td>
<td>Verification, Validation, and Accreditation</td>
</tr>
<tr>
<td>WG</td>
<td>Working Group</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
<tr>
<td>XSD</td>
<td>XML Stylesheet Description</td>
</tr>
<tr>
<td>XSLT</td>
<td>Extensible Stylesheet Language Transformation</td>
</tr>
</tbody>
</table>
1 Introduction

The Modeling and Simulation Coordination Office (M&S CO), which is chartered by the Office of the Secretary Defense (OSD), is focused on facilitating simulation interoperability across government agencies and communities including testing and evaluation, analysis, and acquisition. There is great interest at the Department of Defense (DoD) level and with M&S CO, to support the discovery of M&S assets for these communities and services as directed by the DoD Net-Centric Data Strategy. Discovery is defined as “the ability to locate data assets through a consistent and flexible search.”

The DoD Net-Centric Data Strategy (dated May 9, 2003) defines goals and approaches for users and systems to discover and access a wide range of data assets throughout the DoD Enterprise. This document reports on the necessary discovery metadata to support the net-centric goals of data visibility of M&S assets across the DoD.

1.1 Purpose

The purpose of this specification is to standardize on the set of metadata used to describe assets in Modeling and Simulation Resource Repository (MSRR) nodes and similar applications, and to ensure that the product metadata template will align with the DoD Discovery Metadata Specification (DDMS) as part of the Global Information Grid (GIG) /Net-Centric Data Strategy.

Given ubiquitous Internet Protocol capable communications, the Department’s approach to net-centricity has been set forth in a document called the DoD Net-Centric Data Strategy. It was signed by Assistant Secretary of Defense Networks & Information Integration (ASD NII) on 9 May 2003. This strategy lays out the six clear-cut actionable goals shown in Figure 1-1. The questions beside each goal clarify their intent. Progress toward these goals can be monitored and measured by observation of what capabilities are actually appearing online, who is using them, and what the users feed back to developers and operators.

<table>
<thead>
<tr>
<th>Visible</th>
<th>Is an information resource discoverable by most users?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessible</td>
<td>Is it available on the network, and are tools readily available to use it?</td>
</tr>
<tr>
<td>Understandable</td>
<td>Can it be intelligibly used? Are the semantics well documented?</td>
</tr>
<tr>
<td>Trusted</td>
<td>Is the source, accuracy and currency of the data available to users?</td>
</tr>
<tr>
<td>Interoperable</td>
<td>Can it be combined or compared with other information? Can it be mediated?</td>
</tr>
<tr>
<td>Responsive</td>
<td>Is the data what users need? Are robust user feedback mechanisms in place to improve it?</td>
</tr>
</tbody>
</table>

Figure 1-1 DoD Net-Centric Data Strategy Goals

---

Visibility, accessibility, and understandability are the high priority goals of the DoD Net-Centric Data Strategy. Of these goals, visibility and discovery are intimately linked as identified by DoD Directive 8320.2.

1.2 Terms of Reference

Appendix B provides a complete list of key terms used in this document, however the following terms are central to the purpose and scope of this specification.

1.2.1 M&S Community of Interest (COI)

A COI is defined as “a collaborative group of people that must exchange information in pursuit of its shared goals, interests, missions, or business processes and therefore must have a shared vocabulary for the information it exchanges.” DoD Directive 8320.2 identifies that COIs are responsible for making data Visible, Accessible, and Understandable, and that each COI should extend DDMS to support data sharing needs.

The information that is represented by this specification is a result of the M&S COI’s responsibility to identify what is required for visibility, accessibility, and understanding of M&S assets, which include Resources, Contacts (such as an SME), and Taxonomies. Additionally, careful attention has been made to extend the DDMS to support M&S Resource sharing needs.

1.2.2 Discovery Metadata

This specification is focused on the concept of metadata with respect to the visibility, accessibility, and understanding of M&S assets. Metadata is defined as “structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities.” To state it more simply, metadata is data about data.

There are two types of metadata that can be identified: Structural Metadata and Discovery Metadata.

- **Structural Metadata** is focused on describing the structure of information assets so that a qualified asset can be understood and used.
- **Discovery Metadata**, is focused on that tagging of information assets so that an asset can be found and discovered.

Both these metadata types are further illustrated in Figure 1-2.

---


This specification is focused on defining the necessary attributes for representing Discovery Metadata as it pertains to M&S Resources, Contacts, Taxonomy Classifications, and Workflows. Discovery is defined as the ability to locate information assets. Discovery Metadata provides a consistent means to mark information assets so that they can be stored, organized and located through mechanisms such as searches and queries.

1.3 Scope

The scope of this document is to identify the necessary discovery metadata components needed to support the visibility, accessibility, and understandability of Resources, Contacts, Taxonomy Classifications, and Workflows within the DoD community. This document specifies how such metadata components should be captured to provide a common and consistent mechanism that can be used across the communities influenced by Modeling and Simulation (M&S).

1.3.1 Resources

Resource Metacards are useful in supporting Discovery by providing a means to identify the assets that have been developed and used to support M&S initiatives. M&S Resources include, but are not limited to the following items identified in Table 1-1.

<table>
<thead>
<tr>
<th>Types</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Software</td>
<td>Implements a model or simulation. Sometimes referred to as a Federate or a Member Application.</td>
</tr>
<tr>
<td>2</td>
<td>Adjunct Tool</td>
<td>Software and/or hardware that is either used to provide part of a simulation environment or to transform and manage data used by or produced by a simulation environment. Adjunct tools are differentiated from simulation software in that they do not provide a virtual or constructive model to the simulation environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>Federation</td>
<td>A named set of interacting federate applications, a common object model, and software infrastructure through which they communicate that are used as a whole to achieve some specific objective. <em>(was previously Federations of Simulations)</em></td>
</tr>
<tr>
<td>4</td>
<td>Software Component</td>
<td>A software component used as part of modeling and simulation software. May be source code, binary or byte code, or remote procedures; can be used to construct models and/or provide functionality for simulation systems. Components serve as reusable building blocks with a known set of inputs and provide expected output behavior, but the implementation details may be hidden.</td>
</tr>
<tr>
<td>5</td>
<td>Services</td>
<td>Implements a well-defined interface that delivers data or interactions in support of M&amp;S. The service itself may or may not be a model or simulation as its implementation is abstracted away by its interface. Typically used to support / represent a Service Oriented Architecture (SOA) based environment.</td>
</tr>
<tr>
<td>6</td>
<td>Data</td>
<td>Data in M&amp;S-usable format and data produced by M&amp;S. M&amp;S data may be operational data, data specifically derived from operational data that has been formatted or augmented for M&amp;S use, or synthetic data created for M&amp;S use. M&amp;S data is also any data produced by a model or simulation that provides a synthetic view of reality.</td>
</tr>
<tr>
<td>7</td>
<td>Data Model</td>
<td>Structural meta-model for describing M&amp;S data. A representation of entities (distinguishable persons, places, things, events, or concepts about which information is kept), their properties, and relationships among the entities and/or properties. Data models may be constructed to describe high-level or detailed concepts (known as conceptual and logical data models) or instantiations of data structures such as XML documents or relational databases (known as physical data models).</td>
</tr>
<tr>
<td>8</td>
<td>Interface Model Specification</td>
<td>A well-defined agreement or capability, which, if implemented properly, will yield anticipatable results allowing applications (M&amp;S software and adjunct tools), federations, components and/or services to connect and communicate. Interfaces specifications include structures and/or classes including properties, methods, and/or events which serve to provide the well-defined agreement. Model Specifications might include a well documented conceptual model. An Interface Model Specification might be an HLA Federation Object Model (FOM), TENA LROM, Base Object Model (BOM), or other Data Exchange Model (DEM) used to classify capability. <em>(was previously Interface Specification)</em></td>
</tr>
<tr>
<td>9</td>
<td>M&amp;S Resource Document</td>
<td>A resource dependent document such as a requirements or design specification that specifies information related to an M&amp;S resource. Such document is limited by the use / application of M&amp;S. A plan, design, or specification identifying the characteristics that affects and controls function or development of an application (M&amp;S software and adjunct tool), federation, component, and/or service. <em>(was previously M&amp;S Software Design Document)</em></td>
</tr>
</tbody>
</table>
The mechanism for documenting M&S Resources as independent metacard is described in Section 4. Additionally, each of these M&S Resource types is further defined in Appendix B.

1.3.2 Contacts

Contact Metacards are useful in supporting Discovery by providing a means to identify the persons, organizations or services that can support the use or development an M&S asset.

A Contact representing a person or an organization can be a valuable asset to help others achieve related goals such as reusing and/or integrating M&S Resources. For instance, when simulation developers wish to pose detailed questions to those who were responsible for the development and distribution of a model, point-of-contact (POC) information can be vital.

Until version 1.4 of the MSC-DMS, the mechanism to capture metadata about Persons and Organizations was to explicitly embed that information with a Resource Metacard using the POC component (see Section 4.10). Contact Metacards could not be easily documented independently. However, beginning with version 1.4, Contact Metacards representing Persons or Organizations can be documented independently from an M&S Resource. There is also a capability to associate M&S Contacts (Persons and Organizations) to one or more M&S Resources. The mechanism for documenting an M&S Contact as an independent metacard is described in Section 5.

1.3.3 Taxonomy Classifications

Taxonomy Classification Metacards are useful in supporting discovery by providing a means to identify the terminology used in the development or use of an M&S asset.

Many M&S assets correspond to a specific taxonomy of terms and definitions. The MSC-DMS provided a means to capture M&S Taxonomies in a way that allows the discovery metadata relevant to a resource to be understood more richly.

An M&S Taxonomy metacard identifies a glossary of terms used by an organization, program or focus group that can be attributed to one or more M&S assets. Such Taxonomies provide a greater context for understanding the underlying metadata descriptions provided within an M&S Resource. An M&S Resource may include citations to relevant taxonomies that have been defined. (See Section 4.17). The mechanism for documenting an M&S Taxonomy as an independent metacard is described in Section 6.

1.3.4 Workflow

Workflow Metacards are useful in supporting discovery by providing a means to identify and manage assets that are under development, and to help encourage development of the supporting Resource Metacard(s), ensuring that the discovery metadata Resource Metacard is not an afterthought.
Until version 1.5 of the MSC-DMS, the mechanism to help facilitate the integration of metadata for an asset was often postmortem; after-the-fact. However, the MSC-DMS now provides a means to capture Workflows in a way that allows the discovery metadata relevant to a resource to be captured in the flow of development.

The Workflow Metacards is used to help specify the states, responsibilities and due dates pertaining to the development and delivery of such asset. The following items are captured:

- what aspects of the M&S asset are to be developed,
- who is responsible,
- what responsibilities do they have (both in developing the asset and supporting resource metacard components), and
- when are these aspects due

Managers are encouraged to consider leveraging the Workflow Metacard capability early in the development or update of M&S Assets. Workflow Metacards help drive the development of not just the Asset, but also the related Resource Metacard so that it is no longer an after thought.

The mechanism for documenting an M&S Workflow as an independent metacard is described in Section 7.

### 1.3.5 M&S Support Assets

In addition to Resources, Contacts, Taxonomy Classifications, and Workflows, several M&S Support Assets have been identified for which M&S Resources, Contacts, Taxonomies, and Workflows may apply. These M&S Support Assets included, but are not limited to the following items identified in Table 1-2.

<table>
<thead>
<tr>
<th>Types</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M&amp;S Infrastructure</td>
<td>A set of interconnected M&amp;S support elements that facilitates the use of a set of M&amp;S Resources in a simulation environment.</td>
</tr>
<tr>
<td>2</td>
<td>M&amp;S Activity</td>
<td>An M&amp;S procedure or function, involving tasks that consume time and resources, necessary for events or for moving from event to event.</td>
</tr>
</tbody>
</table>

Table 1-2 - M&S Support Assets
<table>
<thead>
<tr>
<th></th>
<th>M&amp;S Event</th>
<th>M&amp;S Events include tests, analysis, research and design, training, experiments, M&amp;S infrastructure interactions, and internal model interactions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>An interaction between M&amp;S infrastructure components that is associated with a particular point in time that results in something happening or changing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(was previously M&amp;S Support Event)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>M&amp;S Environment</td>
<td>M&amp;S Environment includes Policies, Procedures, People, Infrastructure, Federations</td>
</tr>
<tr>
<td></td>
<td>A set of interconnected M&amp;S resource assets and support assets needed to conduct an event.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Support Document</td>
<td>A supported document is not constrained by the use / application of M&amp;S. For example, it may be a reference document describing real-world operation phenomena, but useful in the context of an M&amp;S environment.</td>
</tr>
<tr>
<td></td>
<td>A document not specific to M&amp;S but describes supporting information such as environmental, event, operational or technical content, or a future capability, which maybe useful in the context of M&amp;S.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Future Capabilities Requirements was previously a standalone support asset type, which has been absorbed into this type under version 1.4.</td>
<td></td>
</tr>
</tbody>
</table>

An M&S Resource may include associations to relevant artifacts representative of either other Resources or M&S Support Assets. Section 4.10 provides further details on how to identify supporting assets associated with an M&S Resource using the Association Metadata Set.

### 1.4 Objective

The objective of this document is to provide a Discovery Metadata specification suitable for use within the M&S Community of Interest (COI) that supports the intent of the DoD Net-Centric Data Strategy as it relates to M&S. The key attributes of the DoD Net-Centric Data Strategy is

1. to ensure data assets are visible, available and usable,
2. tagging such assets with metadata to enable discovery,
3. posting assets to shared spaces with access for validated users,
4. enabling the interoperability and exchange required of a net-centric data environment.

An M&S net-centric data focus centers upon the sharing and reuse of M&S assets, specifically Resources, Contacts, Taxonomies, and Workflows. This document specifies the mechanisms to tag such M&S assets with *metacards*, and also the mechanism to tag multiple metacards, which is identified as a *multicard*.

### 1.5 Intended Audience

This document is intended for individuals and organizations in the DoD M&S community including government, industry, and academia who are interested in supporting the reuse and discovery of metadata assets (resources, contacts and taxonomies) used for purposes related to M&S.
1.6 MSC-DMS and DDMS Relationship

The DoD Net-Centric Data Strategy (NCDS) describes the data visibility goals of the enterprise. The DDMS is specifically mentioned as a generalized discovery metadata specification to support the interoperable exchange of information about any asset, not just those associated with M&S. The NCDS document also establishes “Communities of Interest” (COIs) and COI-specific metadata structures to permit richer description of the assets of a specific community. The M&S COI first implemented its discovery metadata specification (MSC-DMS) in 2008 and has added new capabilities each year since.

DDMS provides the core foundation for the MSC-DMS. To support extensibility, the DDMS is leveraged not as a whole, but by its individual components. Every DDMS Component is correlated semantically with an MSC-DMS Metadata Set. Within the MSC-DMS, additional information pertinent to the M&S community has been included which augments the DDMS Components. The MSC-DMS is also ordered based on the DDMS. The result is a metadata standard that meets the unique needs of the M&S Community, and that is also in congruence with the DoD Enterprise.

In some areas, there are syntactic differences between the DDMS and MSC-DMS metadata to more readily support the M&S community, reduce areas of redundancy and provide for greater extensibility. These syntactic differences, which include the use of common case conventions for XML Elements and Attributes, variances in naming, optimization of common records such as Dates and POCs, and greater exploitation of subtypes such as Security to allow data to be more easily collapsed or expanded, have been made to support these M&S needs. The result is a distinctive specification customized for M&S stakeholders to best expose metadata pertaining to M&S resources that remains semantically equivalent with the DDMS.

Semantic parity is essential to allow MSC-DMS metacards to be ported to equivalent DDMS compliant metacards. In the case where additional M&S information within an MSC-DMS metacard is not structurally represented in the DDMS, the content of that information can still be ported to the DDMS card via an extensible element provided in the root resource node of the DDMS (supported in an XML schema via the #other Element). Similarly, this technique also allows a DDMS metacard to be ported to a MSC-DMS metacard.

Additionally all Metadata Sets defined in the MSC-DMS allow further expansion, not just the root node. If there is a need for an additional subelement or attribute, then it can be easily accommodated simply by importing additional external schemas that support the specific needs of an M&S stakeholder. This mashup support is more fully described in the supporting MSC-DMS Implementation Guide.

1.7 Relaxed MSC-DMS Support

The MSC-DMS also provides a relaxed MSC-DMS schema to assist those developing initial prototype and experimental metacards. The relaxed schema does not provide a means to validate a metacard and insure its compliance with the specification, whereas the default schema as specification document does. Therefore the relaxed schema should NOT be used for representing production ready assets. However, it is recommended that asset developers, producers and
distributers consider using the relaxed schema for creating partial metacards, which they may develop more fully later.

The parallel MSC-DMS Implementation Guide provides examples of how to begin with the relaxed schema set, and also how to transition to the default stringent schema that is more stringent. Tools are also intended to provide to help support such transistion as well.
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2 MSC-DMS Logical Model

2.1 Approach

Based on the needs of the DoD M&S community, this document identifies the core and supplemental set of metadata for the discovery of M&S assets, which includes Resources, Contacts, Taxonomies, and Workflows.

Figure 2-1 depicts the organization of the MSC-DMS metadata. It includes the following:

- The set of Resource metadata components needed for representing M&S assets and supporting resource specific extensions such as verification, validation, and accreditation (VV&A).
- The set of Contact metadata components needed to represent a person and organization such as a Subject Matter Expert (SME).
- The set of Taxonomy metadata components needed to represent a community’s taxonomy, which represents the lexicon of terms, related terms and synonyms used within their domain.
- The set of Workflow metadata components needed to represent M&S assets under development including tasks, assigned responsibilities, and development states related to an asset including its Resource Metacard.

Figure 2-1 Organization Structure for the M&S COI Discovery Metadata Specification
2.2 Organization

The “Light Blue” shaded boxes across the top of Figure 2-1 represent existing standards and specifications that are leveraged in helping define the MSC-DMS. These include the DoD Metadata Specification (DDMS), the Intelligence Community (IC) metadata standards, and the XML-Based Thesaurus Approach considered for the Federal Government (Glossary).

The “Gray” shaded box, identified as the “MSC-DMS-Types” contains all the type components pulled from these standards and additional type defined which are needed to create MSC-DMS based Resources, Contacts and Taxonomies.

The “Green” shaded box identified as “MSC-DMS-Resource-Core” represents the Core Layer of a Resource Metacard, which is intended to be used by all DoD Agencies, the Intelligence Community, and other Organizations or Activities, independent of the specific M&S assets being described. This metadata is the initial driver for interoperability across all activities and establishes, at this level, a minimum set of mandatory and recommended core M&S metadata components.

The “Yellow” shaded box identified as “MSC-DMS-Resource-Supplemental” represents the Supplemental Layer of a Resource Metacard which extends upon the Core Layer. It is useful for supporting specific M&S communities and/or which may be required in some security, data quality, or geospatial contexts. M&S communities that are recognized by this level of metadata include Acquisition, T&E, VV&A, and Analysis.

The “Teal” shaded box identified as “MSC-DMS-Contact” represents the Contact Metacard structure needed to document a Person or Organization.

The “Blue” shaded box identified as “MSC-DMS-Taxonomy” represents the Taxonomy Metacard structure needed to classify terms and definitions relevant to a community or domain.

The “Purple” shaded box identified as “MSC-DMS-Workflow” represents the Workflow Metacard structure used to help support the development of M&S assets including the resource metacard.
Data Element Guide

This section provides notes to assist the reader in understanding the various conventions used to present the MSC-DMS components, herein referred to as metadata components, which are organized within this document. The metadata components that compose the MSC-DMS are explicitly defined in sections 4, 5, 6, 7 and 8 of this document. Each of these sections reflects the components for building Resource Metacards, Contact Metacards, Taxonomy Metacards, Workflow Metacards and Multicards. Each major metadata component documented within these sections is formally identified as a Metadata Set.

The Metadata Sets defined in this document are organized similarly to the recent DDMS structure with the exception that metadata components are specified using a set of tables with descriptive fields closely associated to the style used in many of the IEEE standards. Specifically, the table style has been augmented to include data types (or enumerated values) and comments related to metadata components. In addition a graphical notation has been included to provide a visual understanding of the metadata component structure.

3.1 Graphical Diagrams

A graphic related diagram is used for each Metadata Set to assist the reader in understanding the underlying component structure. An example of a graphic diagram is provided in Figure 3-1.

Figure 3-1 Contact Metadata Set

---

4 Institute of Electrical and Electronics Engineers (IEEE) 1516.3 High Level Architecture (HLA) Object Model Template (OMT) – Section 4: HLA OMT Components
In this example, the organization of the Contact Metadata Set is represented, which is used to document a Contact Metacard. The Contact component is shown to contain either a Person or Organization. It also contains Description, Role, Releasability, Security and Image. The dashed lines in the diagram indicate that the subcomponent is optional. The value range label placed underneath a subcomponent (i.e., 0..infinity) indicates if multiple items pertaining to the subcomponent can exist. The plus symbol in the node indicates that there is further underlying structure to support the subcomponent. The #other attribute and element is provided to allow additional information to be captured and associated with Metadata Set.

These diagrams that are used were generated from the supporting MSC-DMS XML Schemas using the Altova® XMLSpy® tool. The symbols and nomenclature found within these graphic diagrams are further described in Appendix D.

3.2 Dot Notation

Dot Notation is a text convention used for each Metadata Set for describing the affiliation of metadata components and their subcomponents, which is achieved by placing the set of related metadata component within a hierarchical scheme that is representative of a tree structure. Dot Notation reads left to right or from the root of the tree out to branches and leaves. Periods separate the levels or branches.

For example, the convention POC.Person is used to identify that the metadata component of interest is a Person, which is attributed to the POC Metadata Set illustrated previously in section 3.1. The convention Resource.POCs.POC.Person further expands the hierarchy tree as it pertains to the MSC-DMS. A Dot Notation is used to ensure that the reference pertaining to a metadata component is unambiguous. The metadata sets for which Person stems from (POC and Resource) are easily referenced by the class hierarchy tree defined in the text.

3.3 Table Format

Each Metadata Set is defined by a table, which lists the underlying metadata components. Table 3-1 lists and defines the fields used in for specifying the Metadata Sets.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the categories of metadata recognized as components or sub-components that are provided in this table. Sub-components, if applicable, are always indented, and may be reflected using dot notation. These components are defined in XML as either XML Elements or XML Attributes.</td>
<td>A plain text definition of the metadata component.</td>
<td>Specifies whether use of the component is mandatory, optional</td>
<td>Italic is used to denote the type of values that is supported (e.g., text). Normal font is used to denote potential literal values (i.e., enumerations).</td>
<td>Specifies what the component encompasses, or any useful notes</td>
</tr>
</tbody>
</table>

Additionally, a second table is provided to illustrate implementation examples and aid in understanding. Table 3-2 lists and defines the formats of the example tables. Each of these tables,
when applied, will result in one or more rows representing the metadata components associated to the Metadata Set.

<table>
<thead>
<tr>
<th>Table 3-2 Metadata Set Example Table - Columns and Explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table Format</strong></td>
</tr>
<tr>
<td>Metadata Component</td>
</tr>
<tr>
<td>Specifies the categories of metadata that are provided in this table (e.g., component or sub-components). Sub-components, if applicable, are always indented, and may be reflected using dot notation.</td>
</tr>
</tbody>
</table>

### 3.4 Naming Conventions

This specification defines an XML Schema for representing M&S Resources, Contacts, Taxonomy Classifications, Workflows and the collection of metacards identified as an M&S Multicard. Specific Metadata Component names, which are represented in a schema as either XML Elements or XML Attributes adhere to XML naming conventions. MSC-DMS Metadata components defined using **UpperCamel** case reflects a metadata component supported via an XML Element. Whereas, Metadata components defined using **lowerCamel** case reflect a metadata component supported via an XML Attribute. XML conventions require that names be constructed from a combination of letters, digits, hyphens, colons, full stops (periods), and underscores with no spaces or other breaking characters (e.g., tabs, carriage returns, etc.). The MSC-DMS metadata components used within the diagrams, tables and text are presented in accordance with these XML naming conventions.

### 3.5 Common Attributes

There are several common attributes repeated for many of the MSC-DMS elements used to support the documentation of Resources, Contacts Taxonomies, and Workflows. These include the following:

- id
- taxonomy
- other

The *id* attribute may take several forms. It is usually prefixed by the element it is describing. *Id* values are used to to support cross referencing by other other elements and other metacards and can be used for the benefit of organizing data by tools and repositories that manage the data.

The *taxonomy* attribute is used to identify what taxonomy applies to the specific element. A taxThis allows any specific words used within the element to be evaluated and understood based on the marked taxonomy. That marked *taxonomy*, however, must be cited in the RelatedTaxonomy element found within the metacard. This allows tools and users to decipher and examine the related taxonomy applied.
The *other* attribute provides a means to extend an element with additional attributes that may not be characterized in the primary schemas. The use of *other* provides a means to use the MSC-DMS as a framework that be used to build larger more detailed metacards.

### 3.6 Common Elements

In addition to the common attributes mentioned previously, there are some common subelements repeated for many of the MSC-DMS elements used to support the documentation of Resources, Contacts Taxonomies, and Workflows. These include the following:

- Relasability
- Security
- Other

The *Relasability* element provides a means to document the relasability pertaining to the element. Relasability of information can vary at any one element. It is very similar to security.

The *Security* element provides a means to document the security of information pertaining to the element it is hinged with. For example, the security subelement for a resource is intended to describe the security broadly associated to the resource. Whereas the security subelement of a node like a POC is intended to describe the security associated solely to that POC.

The *Other* element provides a means to extend an element with additional subelements that may not be characterized in the primary schemas. The use of *Other* provides a means to use the MSC-DMS as a framework that be used to build larger more detailed metacards.
4 Resource Metacards

An M&S Resource represents assets that contribute to the composition or operation of an M&S event, environment or infrastructure. M&S Resources include such things as services, software, components, federations, adjunct tools, data, data models, interface model specifications, and resource specific documents. The supporting Discovery Metadata for an M&S Resource enables inferences to be drawn regarding its application and reuse potential.

For reuse to be effective, it is important to include a minimum but sufficient degree of descriptive information for a Resource Metacard. For instance, when integrators wish to pose detailed questions to those who were responsible for the development and distribution of a data model, point of contact (POC) information within an M&S Resource is important.

Figure 4-1 provides an illustration of the MSC-DMS Resource Structure, which integrates Core and Supplemental Layer component views pertaining to Discovery Metadata. The boxes with a solid outline represent required metadata components, whereas the boxes with a dashed outline represent optional metadata components.

This section describes both the Core Layer of metadata components commonly needed across communities, and also the Supplemental Layer of metadata components needed to support the various communities and domain needs. This includes the following metadata sets:

Core Layer
- Resource (root)
- MetacardInfo
- Title
- Version
- Description
- Usages
- Dates
- Rights
- Source
- Type
- POCs
- Keywords
- Image
- Extensions
- RelatedResources
- RelatedTaxonomies
- Releasability
- Security

Supplemental Layer (via Extensions)
- Temporal Coverage
- Virtual Coverage
- Geospatial Coverage
- HLA Coverage
- VV&A Coverage
- Resource Management

Figure 4-1 Resource Metacard Structure
4.1 Resource Metadata Set

The purpose of the Resource Metadata Set is to document certain key metadata information about an M&S Resource. The Resource Metadata Set identifies the foundational metadata components of an M&S Resource at the Core Layer. This is illustrated in Figure 4-1a. Additionally, the extensions for supporting the Supplemental Layer of an M&S Resource metacard is illustrated in Figure 4-1b.

Figure 4-1a Resource Metadata Set (Core Layer)

Figure 4-1b Resource Extensions (Supplemental Layer)
4.1.1 Scope

**Metacard Type:** Resource Metacard  
**Use Path(s):** none (*this is the root component for a Resource metacard*)  
Multicard.Metacards.Resources (*see Multicard Metadata Set*)  
**Required:** yes (*if you are building a Resource metacard, but not required for a Multicard*)  
**Schema:** MSC-DMS-Resource

4.1.2 Table Format

Table 4-1a provides a description of the metadata components pertaining to the Resource Metadata Set information. Many of the metadata components used for the Resource Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were extended, altered or added to better support the M&S COI. Italics are used in the Values column of Table 4-1a to denote the type of data to be provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>resourceID</td>
<td>Unique identifier associated to the related Resource being described</td>
<td>1</td>
<td>URI</td>
<td>A Resource record can be marked by a unique identifier to support cross referencing by other Resources and for the benefit of organizing data by one or more repositories. This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing a Resource component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22)</td>
</tr>
<tr>
<td>Metacard Info</td>
<td>Specifies info related to metacard (as opposed to the asset)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>metacardID</td>
<td>Unique identifier associated to the metacard of the Resource being described, which is captured in an XML document conforming to this specification.</td>
<td>1</td>
<td>URI</td>
<td>It may be possible for the Resource_ID and metacard_ID to have corresponding IDs. For those creating Resources and/or generating metacards, please check with the practices of your organization or the repository/catalog for which you are posting your Resource and Resource metacard.</td>
</tr>
<tr>
<td>Title</td>
<td>Title information assigned to the Resource.</td>
<td>1..many</td>
<td></td>
<td>-- see Title Metadata Set</td>
</tr>
<tr>
<td>Version</td>
<td>This field specifies the version identification assigned to the Resource.</td>
<td>1</td>
<td></td>
<td>-- see Version Metadata Set</td>
</tr>
<tr>
<td>Description</td>
<td>This field provides an account of the content of the Resource.</td>
<td>1</td>
<td></td>
<td>-- see Description Metadata Set</td>
</tr>
<tr>
<td>Usages</td>
<td>Specifies information about usages pertaining to the M&amp;S Resource.</td>
<td>0..1</td>
<td></td>
<td>Container Class for Usage elements</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Usage</th>
<th>Identifies information for each usage.</th>
<th>1..many</th>
<th>-- see Usage Metadata Set</th>
<th>Section 4.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage Experience</td>
<td>Identifies information for each usage.</td>
<td>0..1</td>
<td>-- see Experience Metadata Set</td>
<td>Section 4.7</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other POC information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Dates</td>
<td>A calendar date associated with an event in the life cycle of the Resource.</td>
<td>1</td>
<td>Container Class for Date elements</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Identifies information for each date.</td>
<td>1..many</td>
<td>-- see Date Metadata Set</td>
<td>Section 4.8</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other date information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Rights</td>
<td>Information about rights held in and over the Resource.</td>
<td>0..1</td>
<td>-- see Rights Metadata Set</td>
<td>Section 4.9</td>
</tr>
<tr>
<td>Source</td>
<td>Specifies information about the source media pertaining to the M&amp;S Resource.</td>
<td>0..1</td>
<td>-- see Source Metadata Set</td>
<td>Section 4.10</td>
</tr>
<tr>
<td>Type</td>
<td>This field specifies the type that the Resource represents. Also described as the nature, genre, or discipline of the content of the Resource.</td>
<td>1..many</td>
<td>-- see Type Metadata Set</td>
<td>Section 4.11</td>
</tr>
<tr>
<td>POCs</td>
<td>Specifies organizations and/or persons and/or service who have a particular role with respect to the M&amp;S Resource.</td>
<td>0..1</td>
<td>Container Class for POC elements</td>
<td></td>
</tr>
<tr>
<td>POC</td>
<td>Specifies an organization or a person that has a significant level of responsibility or ownership pertaining to M&amp;S Resource.</td>
<td>1..many</td>
<td>-- see POC Metadata Set</td>
<td>Section 4.12</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other POC information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Keywords</td>
<td>Specifies keywords attributed to the M&amp;S Resource.</td>
<td>1</td>
<td>Container Class for Keyword elements</td>
<td></td>
</tr>
<tr>
<td>Keyword</td>
<td>Identifies information for each keyword.</td>
<td>1..many</td>
<td>-- see Keyword Metadata Set</td>
<td>Section 4.13</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other POC information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Image</td>
<td>Specifies an image that can be used to visually represent a Resource.</td>
<td>0..many</td>
<td>-- see Image Metadata Set</td>
<td>Section 4.14</td>
</tr>
<tr>
<td>Supplemental Extensions</td>
<td>Specifies the various extensions that can be added to the core M&amp;S Resource metadata.</td>
<td>0..1</td>
<td>Container Class for any type of supplemental+ element</td>
<td></td>
</tr>
<tr>
<td>Virtual Coverage</td>
<td>Specifies virtual coverage extension that can be added to core metadata.</td>
<td>0..many</td>
<td>-- see Virtual Coverage Metadata Set</td>
<td>Section 4.15</td>
</tr>
<tr>
<td>Temporal Coverage</td>
<td>Specifies temporal coverage extension that can be added to core metadata.</td>
<td>0..many</td>
<td>-- see Temporal Coverage Metadata Set</td>
<td>Section 4.16</td>
</tr>
</tbody>
</table>
4.1.3 Inclusion Criteria

The metadata components specified in Table 4-1a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.1.4 Example

Table 4-1b provides an example of the Resource Metadata Set component that can be reflected within the metacard for an M&S Resource.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>resourceID</td>
<td>4</td>
</tr>
<tr>
<td>taxonomy</td>
<td>missile_defense</td>
</tr>
<tr>
<td>MetacardInfo.metacardID</td>
<td>23433</td>
</tr>
<tr>
<td>Title</td>
<td>BallisticModelAlgorithm</td>
</tr>
<tr>
<td>.Value</td>
<td>ShortRangeTrajectory</td>
</tr>
<tr>
<td>.Subtitle</td>
<td></td>
</tr>
</tbody>
</table>

Table 4-1b Resource Metadata Set Example
<table>
<thead>
<tr>
<th>.Title Acronym</th>
<th>BMA-SRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document Number</td>
<td>ALGO_1523.13</td>
</tr>
<tr>
<td>Version.Value</td>
<td>1.0</td>
</tr>
<tr>
<td>Description</td>
<td>algorithm used for high fidelity short range attack models</td>
</tr>
<tr>
<td>Usages.Usage</td>
<td>— see Usage Metadata Set for example</td>
</tr>
<tr>
<td>Usages.Usage.Experience</td>
<td>— see Experience Metadata Set for example</td>
</tr>
<tr>
<td>Dates.Date</td>
<td>— see Date Metadata Set for example</td>
</tr>
<tr>
<td>Rights</td>
<td>— see Rights Metadata Set for example</td>
</tr>
<tr>
<td>Source</td>
<td>— see Source Metadata Set for example (was once Source)</td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>.Qualifier</td>
<td>DCMITYPE</td>
</tr>
<tr>
<td>.Value</td>
<td>Software</td>
</tr>
<tr>
<td>.Subtype</td>
<td>Java</td>
</tr>
<tr>
<td>ADS-Designation</td>
<td>—</td>
</tr>
<tr>
<td>POCs.POC</td>
<td>— see POC Metadata Set for example</td>
</tr>
<tr>
<td>Keywords.Keyword</td>
<td>— see Keyword Metadata Set for example</td>
</tr>
<tr>
<td>Image</td>
<td>— see Image Metadata Set for example</td>
</tr>
<tr>
<td>Extensions</td>
<td></td>
</tr>
<tr>
<td>.Virtual Coverage</td>
<td>— see Virtual Coverage Metadata Set for example</td>
</tr>
<tr>
<td>.Temporal Coverage</td>
<td>— see Temporal Coverage Metadata Set for example</td>
</tr>
<tr>
<td>.Geospatial Coverage</td>
<td>— see Geospatial Coverage Metadata Set for example</td>
</tr>
<tr>
<td>.HLA Coverage</td>
<td>— see HLA Coverage Metadata Set for example</td>
</tr>
<tr>
<td>.V&amp;V Coverage</td>
<td>— see V&amp;V Metadata Set for example</td>
</tr>
<tr>
<td>.Resource Management</td>
<td>— see Resource Management Metadata Set for example</td>
</tr>
<tr>
<td>RelatedResources.Resource</td>
<td>— see RelatedResources Metadata Set for example</td>
</tr>
<tr>
<td>RelatedTaxonomy.Taxonomy</td>
<td>— see Related Taxonomy Metadata Set for example</td>
</tr>
<tr>
<td>Releasability</td>
<td>— see Releasability Metadata Set for example</td>
</tr>
<tr>
<td>Security</td>
<td>— see Security Metadata Set for example</td>
</tr>
</tbody>
</table>
4.2 Metacard Info Metadata Set

It is important to identify the Metacard Information pertaining to the metacard attributed to an M&S Resource. This section describes the MetacardInfo Metadata Set for documenting the metacard as illustrated in Figure 4-2. It is based on the component of the same name found within the DDMS.

![Figure 4-2 Metacard Info Metadata Set](image)

4.2.1 Scope

- **Metacard Type:** Resource Metacard (Core Layer)
- **Use Path(s):** Resource.Metacardinfo *(see Resource Metadata Set)*
- **Required:** yes
- **Schema:** MSC-DMS-Resource

4.2.2 Table Format

Table 4-2a provides a description of the metadata components pertaining to the Metacard Info Metadata Set. The majority of the metadata components used for the Metacard Info Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-2a to
denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

Table 4-2a Metacard Info Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>metacardID</td>
<td>Unique identifier associated to the Metacard of the Resource being described.</td>
<td>1</td>
<td>URI</td>
<td>It may be possible for the ResourceID (See Table 4-1) and MetacardID to have corresponding IDs. For those creating Resources and/or generating metacards, please check with the practices of your organization or the repository/catalog for which you are posting your Resource and Resource metacard.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Title component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22)</td>
</tr>
<tr>
<td>Dates</td>
<td>A calendar date associated with an event in the life cycle of the metacard.</td>
<td>1..many</td>
<td></td>
<td>Section 4.8</td>
</tr>
<tr>
<td>Date</td>
<td>Identifies information for each date.</td>
<td>1..many</td>
<td>-- see Date Metadata Set</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other date information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td>Section 4.8</td>
</tr>
<tr>
<td>POCs</td>
<td>Specifies organizations and/or persons who have a particular role with respect to the M&amp;S metacard.</td>
<td>1..1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POC</td>
<td>Specifies an organization or a person that has a significant level or responsibility or ownership pertaining to M&amp;S metacard.</td>
<td>1..many</td>
<td>-- see POC Metadata Set</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other POC information deemed relevant by the author of the metacard.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Description of the metacard.</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the metacard.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the metacard.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other title information deemed relevant by the author of the metacard.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

### 4.2.3 Inclusion Criteria

The metadata components specified in Table 4-2a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 4.2.4 Example

Table 4-2b provides an example of a **Title** component that can be reflected within the metacard for an M&S Resource.
### Table 4-2b MetacardInfo Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Values</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>metacardid</td>
<td>Ballistic Model Algorithm</td>
<td><code>&lt;ms:MetacardInfo ms:metacardID=&quot;2342342&quot; ms:taxonomy=&quot;missiles&quot;/&gt;</code></td>
</tr>
<tr>
<td>taxonomy</td>
<td>Short Range Trajectory</td>
<td><code>&lt;ms:Dates/&gt;</code></td>
</tr>
<tr>
<td>Dates</td>
<td>— see Table 4.8b for example</td>
<td><code>&lt;ms:POC/&gt;</code></td>
</tr>
<tr>
<td>POC</td>
<td>— see Table 4.12b for example</td>
<td><code>&lt;ms:Releasability/&gt;</code></td>
</tr>
<tr>
<td>Releasability</td>
<td>— see Table 4.23b for example</td>
<td><code>&lt;ms:Security/&gt;</code></td>
</tr>
<tr>
<td>Security</td>
<td>— see Table 4.24b for example</td>
<td><code>&lt;/ms:MetacardInfo&gt;</code></td>
</tr>
<tr>
<td>other</td>
<td>na</td>
<td></td>
</tr>
</tbody>
</table>
4.3 Title Metadata Set

It is important to identify the Title attributed to an M&S Resource. This section describes Title Metadata Set for documenting the Resource Title as illustrated in Figure 4-3.

**Figure 4-3 Title Metadata Set**

4.3.1 Scope

- **Metacard Type:** Resource Metacard (Core Layer)
- **Use Path(s):** Resource.Title (see Resource Metadata Set)
- **Required:** yes
- **Schema:** MSC-DMS-Resource

4.3.2 Table Format

Table 4-3a provides a description of the metadata components pertaining to the Title Metadata Set. Many of the metadata components used for the Title Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-3a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.
Table 4-3a Title Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>title</td>
<td>A name, or names, assigned to the Resource.</td>
<td>1</td>
<td>text</td>
<td>Typically, a title will be a name by which the Resource is formally known. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>subtitle</td>
<td>A subtitle may be any form of the title used as a substitute, or it may be an alternative to the formal title of the Resource.</td>
<td>0..1</td>
<td>text</td>
<td>Typically, a subtitle will be a name by which the Resource may also be known or provides amplifying information about the Resource. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>acronym</td>
<td>An acronym used to also identify the Resource</td>
<td>0..1</td>
<td>text</td>
<td>Typically, an acronym will be an identifier by which the Resource may also be known.</td>
</tr>
<tr>
<td>documentNumber</td>
<td>An alphanumeric identifier for an information Resource that is assigned by the configuration manager for this type of Resource.</td>
<td>0..1</td>
<td>text</td>
<td>Often an asset may be identified by a specific unique number, which may contain alphanumeric characters. Note: if a documentNumber is not assigned, then the Source.Location identifier (found in Table 4-10a) should be present.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Title component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16).</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the title information.</td>
<td>1</td>
<td>-- see Security Metadata Set (Sublevel – Required)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other title information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.3.3 Inclusion Criteria

The metadata components specified in Table 4-3a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.3.4 Example

Table 4-3b provides an example of a Title component that can be reflected within the metacard for an M&S Resource.

Table 4-3b Title Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Values</td>
</tr>
<tr>
<td>title</td>
<td>Ballistic Model Algorithm</td>
</tr>
<tr>
<td>subtitle</td>
<td>Short Range Trajectory</td>
</tr>
</tbody>
</table>

<ms:Title
ms:title="Ballistic Model Algorithm"
ms:subtitle="Short Range Trajectory"
<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>acronym</td>
<td>BMA-SRT</td>
</tr>
<tr>
<td>document Number</td>
<td>ALGO_1523.13</td>
</tr>
<tr>
<td>taxonomy</td>
<td>ballistic-flight</td>
</tr>
<tr>
<td>Releasability</td>
<td>——see Table 4.23b for example</td>
</tr>
<tr>
<td>Security</td>
<td>——see Table 4.24b for example</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>

```xml
<ms:Title>
  ms:acronym="BMA-SRT"
  ms:documentNumber="ALGO_1523.13"
  ms:taxonomy="ballistic-flight">
  <ms:Releasability/>
  <ms:Security/>
</ms:Title>
```
4.4 Version Metadata Set

It is important to identify the Version pertaining to an M&S Resource. This section describes the Version Metadata Set for documenting the Resource Version as illustrated in Figure 4-4.

![Figure 4-4 Version Metadata Set]

4.4.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Core Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Version (see Resource Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>yes</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>

4.4.2 Table Format

Table 4-4a provides a description of the metadata components pertaining to the Version Metadata Set. Many of the metadata components used for the Version Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-4a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>A version identifier value assigned to the Resource.</td>
<td>1</td>
<td>text</td>
<td>A version may be an internal, external, and/or universal identification label for representing an M&amp;S Resource by means of a string or number conforming to a formal identification system. An example of an identifier would be an International Standard Serial Number (ISSN).</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>
4.4.3 Inclusion Criteria

The metadata components specified in Table 4-4a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.4.4 Example

Table 4-4b provides an example of a Version component that can be reflected within the metacard for an M&S Resource.

Table 4-4b Version Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Values</td>
</tr>
<tr>
<td>value</td>
<td>1.0</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td>&lt;ms:Version ms:value=&quot;1.0&quot;/&gt;</td>
</tr>
</tbody>
</table>
4.5 Description Metadata Set

It is important to provide a Description pertaining to an M&S Resource. This section describes the Description Metadata Set for documenting the Resource Description as illustrated in Figure 4-5.

![Figure 4-5 Description Metadata Set]

4.5.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Core Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Description (see Resource Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>yes</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>

4.5.2 Table Format

Table 4-5a provides a description of the metadata components pertaining to the Description Metadata Set. Many of the metadata components used for the Description Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-5a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.
**Table 4-5a Description Metadata Set**

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Description component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16). If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Text</td>
<td>Reflects the narrative associated to the description.</td>
<td>1</td>
<td>text</td>
<td>Typically, a description will provide the context and scope of the M&amp;S Resource. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the title information.</td>
<td>1</td>
<td>-- see Security Metadata Set (Sublevel – Required)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

**4.5.3 Inclusion Criteria**

The metadata components specified in Table 4-5a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

**4.5.4 Example**

Table 4-5b provides an example of a Description component that can be reflected within the metacard for an M&S Resource.

**Table 4-5b Description Metadata Example**

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Values</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>ballistic-flight</td>
<td>`&lt;ms:Description ms:taxonomy=&quot;ballistic-flight&quot;&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="">ms:Text</a>&quot;algorithm used for high fidelity short range attack #mortars&quot;&lt;/ms:Text&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="">ms:Releasability/</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="">ms:Security/</a></td>
</tr>
<tr>
<td>Releasability</td>
<td>—see Table 4.23b for example</td>
<td><code>&lt;/ms:Description&gt;</code></td>
</tr>
<tr>
<td>Security</td>
<td>—see Table 4.23b for example</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>na</td>
<td></td>
</tr>
</tbody>
</table>

Version 1.5 July 12, 2012
4.6 Usage Metadata Set

It is often important to recognize and understand the intended and actual usage of an M&S Resource. The Usage component provides a means to reflect this information. This section describes the table format identified for documenting Usage. The Usage component also includes the ability to describe Experience metadata; since Resources are intended to be used, it is important to reflect the stories and experiences of how a Resource may have been used.

The Usage component also includes the ability to identify the primary Language of the intellectual content of the M&S Resource for which it was intended. Such Usage helps understand the natural language used for human communication for which the resources was proposed. Language does not necessarily restrict a resource’s ability to be leveraged by the M&S COI, but the identification of its language origin helps further understanding the intended usage. This section, therefore, also describes the table format identified for documenting Language. This is illustrated in Figure 4-6.

In the case that the desire is to capture the language used for computer communication, such as a source code language, the Source element described in section 4.10 contains a CodeLanguage element that should be used.

![Figure 4-6 Usage Metadata Set](image)
The Usage Metadata Set described in this section is a component of the Usages Metadata Set, which is considered a container class. There may be 1..many occurrences of Usage elements for the Usage container as specified in Table 4-1a.

4.6.1 Scope

Metacard Type: Resource Metacard (Core Layer)
Use Path(s): Resource.Usages.Usage (see Resource Metadata Set)
Required: no
Schema: MSC-DMS-Resource

4.6.2 Table Format

Table 4-6a provides a description of the metadata components pertaining to the Usage Metadata Set information, which is leveraged by the Resource.Usages.Usage component within the Resource Metadata Set. Many of the metadata components used for the Usage Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. This includes the Experience metadata component, which borrows from the commercial retail community such as Amazon.com, which provides a means for readers to comment on books that others may be considering buying. Italics are used in the Values column of Table 4-6a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Usage component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 5.17) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Purpose</td>
<td>This field specifies the purpose for which the Resource was developed or used.</td>
<td>1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form '#word' can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>ApplicationDomain.value</td>
<td>Specifies the type or class of application to which the Resource pertains.</td>
<td>0..1</td>
<td>analysis, training, t&amp;e, engineering, acquisition, planning, assessment doctrine, logistics, support to ops, intelligence, other text</td>
<td></td>
</tr>
<tr>
<td>Limitations</td>
<td>This field specifies any known applications for which this Resource has been found not to be appropriate.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form <code>#word</code> can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Experience</td>
<td>Specifies a description of where the Resource has been used in the construction of other object models. A date and POC can be provided with each History log.</td>
<td>0..1</td>
<td>-- see Experience Metadata Set</td>
<td>Section 4.7 // previously called History</td>
</tr>
<tr>
<td>Language</td>
<td>The primary language of the intellectual content of the Resource.</td>
<td>0..1</td>
<td>Based on DDMS</td>
<td></td>
</tr>
<tr>
<td>qualifier</td>
<td>The value that specifies the originating agency or discipline of the language vocabulary.</td>
<td>0..1</td>
<td>text</td>
<td>Specifies the domain vocabulary of which the Language Value is a member. ISO 639-1 and ISO 639-2, Codes for the representation of names of languages, reference 2 and 3 digit language codes. (Follows DDMS convention)</td>
</tr>
<tr>
<td>value</td>
<td>The identification of the content language.</td>
<td>0..1</td>
<td>text</td>
<td>The identification of the content language. Must be a valid code from the vocabulary specified in the Language Qualifier. (Follows DDMS convention)</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other language information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Capability</td>
<td>Specifies the capabilities ascribed to the usage of the Resource</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form <code>#word</code> can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>ProductionMetric</td>
<td>A categorization scheme whose values and use are defined by DDNI-A.</td>
<td>0..1</td>
<td>The productionMetric element must be marked according to CAPCO guidelines, the IC ISM Data Dictionary and the IC ISM Schema Guide.</td>
<td></td>
</tr>
<tr>
<td>subject</td>
<td>An attribute of productionMetric that holds a method of categorizing the subject of a document in a fashion understandable by DDNI-A.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>coverage</td>
<td>An attribute of productionMetric that holds a method of categorizing the coverage of a document in a fashion understandable by DDNI-A.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other usage information deemed relevant by the author of the Resource.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>NonStateActor</td>
<td>Non-state actors that are within the scope of coverage for the described item.</td>
<td>0..1</td>
<td>text</td>
<td>The nonStateActor element must be marked according to CAPCO guidelines, the IC ISM Data Dictionary and the IC ISM Schema Guide.</td>
</tr>
<tr>
<td>order</td>
<td>An attribute of nonStateActor that specifies a user-defined order of an element within the given document. All elements in the document which specify the order attribute should be interpreted as entries in a single, ordered list even though they may appear on different elements. Values must be sequential, starting at 1, and may not contain duplicates.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other usage information deemed relevant by the author of the Resource.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form <code>#word</code> can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other usage information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>
4.6.3 Inclusion Criteria

The metadata components specified in Table 4-6a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.6.4 Example

Table 4-6b provides an example of a Usage component that can be reflected within the metacard for an M&S Resource.

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>Purpose</td>
<td>To model short range projectile accuracy</td>
</tr>
<tr>
<td>ApplicationDomain</td>
<td>Test and Evaluation</td>
</tr>
<tr>
<td>Limitations</td>
<td>Not intended for elevations above 3K ft</td>
</tr>
<tr>
<td>Experience</td>
<td>-- see Experience Metadata Set for Example</td>
</tr>
<tr>
<td>Language qualifier</td>
<td>ISO 639-1</td>
</tr>
<tr>
<td>Language value</td>
<td>fr</td>
</tr>
<tr>
<td>Capability</td>
<td>capable for use in seaboard experiments</td>
</tr>
<tr>
<td>NonStateActor order</td>
<td>Launcher</td>
</tr>
<tr>
<td>Releasability</td>
<td>-- see Releasability Metadata Set for example</td>
</tr>
<tr>
<td>Security</td>
<td>-- see Security Metadata Set for example</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Missile_Defense</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>
4.7 Experience Metadata Set

Since Resources are intended to be used, it is important to reflect the stories and experiences of how a Resource may have been used and by whom. The Experience component provides a means to reflect this information within the Usage Metadata Set. The Experience Metadata Set is illustrated in Figure 4-7.

![Figure 4-7 Experience Metadata Set]

4.7.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type</th>
<th>Resource Metacard (Core Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schema</td>
<td>MSC-DMS-Resource</td>
</tr>
<tr>
<td>Use Path(s)</td>
<td>Resource.Usages.Usage.Experience (see Usage Metadata Set)</td>
</tr>
<tr>
<td>Required</td>
<td>no</td>
</tr>
</tbody>
</table>

4.7.2 Table Format

The Experience metadata component borrows from the commercial retail community such as Amazon.com, which provides a means for readers to comment on books that others may be considering buying. Table 4-7a provides a description of the metadata components pertaining to the Experience Metadata Set information, which is leveraged by the Resource.Usages.Usage.Experience component within the Resource Metadata Set. Italics are used in the Values column of Table 4-7a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.
### Table 4-7a Experience Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>rating</td>
<td>Identifies a set of values from 1 to 5 to show value of asset by experienced user</td>
<td>0..1</td>
<td>Poor, Fair, Average, Good, Excellent</td>
<td>Typically Poor = 1 star, Fair = 2 stars, Average = 3 stars, Good = 4 stars, Excellent = 5 stars</td>
</tr>
<tr>
<td>reviewTitle</td>
<td>Identifies a title for the users review</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Experience component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 5.17) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Date</td>
<td>Identifies the historical date the Resource was used.</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>value</td>
<td>The type of date being represented for a specific state of the Resource.</td>
<td>1</td>
<td>created, posted, accepted, modified, validTil, infoCutOff, used, VV, accreditation, retired, last verified, other text</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>This field identifies the specific date being disclosed.</td>
<td>1</td>
<td>YYYY-MM-DD</td>
<td></td>
</tr>
<tr>
<td>Review</td>
<td>Used to describe the experience pertaining to the historical use of a Resource.</td>
<td>1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>POCref</td>
<td>Identifies the specific POC reporting the use history experience.</td>
<td>0..1</td>
<td>-- see how it is specified in Rights Metadata Set</td>
<td>Identifies a POC reference including id and name</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other history information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

### 4.7.3 Inclusion Criteria

The metadata components specified in Table 4-7a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 4.7.4 Example

Table 4-7b provides an example of a Usage component that can be reflected within the metacard for an M&S Resource.
### Table Format

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>rating</td>
<td>used</td>
</tr>
<tr>
<td>reviewTitle</td>
<td>Good fit for supporting littoral warfare</td>
</tr>
<tr>
<td>Date</td>
<td>2007-10-01</td>
</tr>
<tr>
<td>type</td>
<td>used</td>
</tr>
<tr>
<td>Review</td>
<td>Successful in supporting joint and coalition littoral warfare exercises October 2007</td>
</tr>
<tr>
<td>POCref</td>
<td></td>
</tr>
<tr>
<td>Person.personID</td>
<td>345</td>
</tr>
<tr>
<td>Person.Name</td>
<td>Samuel, Albert, Drake</td>
</tr>
<tr>
<td>other</td>
<td>---</td>
</tr>
</tbody>
</table>

### XML Format

```xml
<ms:Experience ms:rating="High"
  ms:reviewTitle="Good fit for supporting littoral warfare">
  <ms:Date
    ms:value="2007-10-01"
    ms:type="used"/>
  <ms:Review>
    Successful in supporting joint and coalition littoral warfare exercises October 2007
  </ms:Review>
  <ms:POCref>
    <ms:Person
      ms:personID="345">
      <ms:Name
        ms:first="Samuel"
        ms:middle="Albert"
        ms:last="Drake"/>
    </ms:Person>
  </ms:POCref>
</ms:Experience>
```
4.8 Date Metadata Set

It is important to capture the essential Dates pertaining to an M&S Resource such as when it was created, accepted, or modified. This section describes the Date Metadata Set for documenting a Resource Date as illustrated in Figure 4-8.

![Figure 4-8 Date Metadata Set](image)

The Date Metadata Set described in this section is a component of the Dates Metadata Set, which is considered a container class. There may be 1..many occurrences of Date elements for the Dates container as specified in Table 4-1a.

4.8.1 Scope

**Metacard Type:** Resource Metacard (Core Layer)

**Use Path(s):** Resource.Dates (see Resource Metadata Set)

**Required:** yes

**Schema:** MSC-DMS-Resource

4.8.2 Table Format

Table 4-8a provides a description of the metadata components pertaining to the Date Metadata Set, which is leveraged by several components within the Resource Metadata Set. Many of the metadata components used for the Date Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-8a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>This field identifies the specific date being disclosed for the Resource.</td>
<td>1</td>
<td>YYYY-MM-DD</td>
<td>YYYY 0000 through current year, MM 01 through 12 (month), DD 01 through 31 (day)</td>
</tr>
</tbody>
</table>
4.8.3 Inclusion Criteria

The metadata components specified in Table 4-8a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.8.4 Example

Table 4-8b provides an example of a Date component that can be reflected within the metacard for an M&S Resource.

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Value</td>
</tr>
<tr>
<td>value</td>
<td>2007-08-13</td>
</tr>
<tr>
<td>type</td>
<td></td>
</tr>
</tbody>
</table>
4.9 Rights Metadata Set

It is important to identify the rights pertaining to an M&S Resource. This section describes the Rights Metadata Set for documenting a Resource Rights as illustrated in Figure 4-9.

Figure 4-9 Rights Metadata Set

4.9.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Core Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Rights  <em>(see Resource Metadata Set)</em></td>
</tr>
<tr>
<td>Required:</td>
<td>no</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>
4.9.2 Table Format

Table 4-9a provides a description of the metadata components pertaining to the Rights Metadata Set. Many of the metadata components used for the Rights Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-9a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>privacy act</td>
<td>An indicator that this Resource is categorized as containing personal information subject to protection by the Privacy Act.</td>
<td>0..1</td>
<td>boolean</td>
<td>A yes/no value used to specify applicability of the rights. The default is “false.”</td>
</tr>
<tr>
<td>intellectual property</td>
<td>An indicator identifying Resources under protection against reproduction and distribution without the express written permission of the intellectual property rights owner.</td>
<td>0..1</td>
<td>boolean</td>
<td>A yes/no value used to specify applicability of the rights. The default is “false.”</td>
</tr>
<tr>
<td>copyright</td>
<td>An indicator identifying Resources under protection against reproduction and distribution without the express written permission of the copyright owner.</td>
<td>0..1</td>
<td>boolean</td>
<td>A yes/no value used to specify applicability of the rights. The default is “false.”</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Rights component.</td>
<td>0..1</td>
<td>text</td>
<td>The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>POCref</td>
<td>Specifies a reference to an organization or a person who holds Intellectual Property (IP) or copyright pertaining to M&amp;S Resource.</td>
<td>0..many</td>
<td></td>
<td>Person or Org (only one selected per POC identified).</td>
</tr>
<tr>
<td>Person</td>
<td>Identifies a Person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.personID</td>
<td>Unique identifier associated to a Person</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name</td>
<td>Name of the person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>First Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.middle</td>
<td>Middle Name of the person.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.last</td>
<td>Last Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Org</td>
<td>Identifies an Organization.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.organizationID</td>
<td>References the organization ID.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name.value</td>
<td>Identifies the name of the organization.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Text</td>
<td>Provides a description of the POC that may be helpful</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other rights information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.9.3 Inclusion Criteria

The metadata components specified in Table 4-9a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.9.4 Example

Table 4-9b provides an example of a Rights component that can be reflected within the metacard for an M&S Resource.
### Table 4-9b Rights Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metadata Component</strong></td>
<td><strong>Values</strong></td>
</tr>
<tr>
<td>privacy act</td>
<td>false</td>
</tr>
<tr>
<td>intellectual property</td>
<td>false</td>
</tr>
<tr>
<td>copyright</td>
<td>false</td>
</tr>
<tr>
<td>POCref Person</td>
<td></td>
</tr>
<tr>
<td>.personID</td>
<td>345</td>
</tr>
<tr>
<td>.Name</td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>Samuel</td>
</tr>
<tr>
<td>.last</td>
<td>Drake</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>POCref Person</td>
<td></td>
</tr>
<tr>
<td>.personID</td>
<td>346</td>
</tr>
<tr>
<td>.Name</td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>William</td>
</tr>
<tr>
<td>.middle</td>
<td>Austin</td>
</tr>
<tr>
<td>.last</td>
<td>Gilbert</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>POCref Org</td>
<td></td>
</tr>
<tr>
<td>.organizationID</td>
<td>321</td>
</tr>
<tr>
<td>.Name</td>
<td>SprocketSim</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Text</td>
<td>Org w SBIR data rights</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.10 Source Metadata Set

Often media properties may be associated to an M&S Resource. This section describes the table format identified for capturing details for documenting the Source of the asset described by the metacard. This component was previously identified as Media. Information includes a source’s location and media format. The Source properties include Format, Code Language, and Location. It is often important to recognize and understand the physical or digital manifestation of an M&S Resource. The Source.Format component provides a means to reflect this information. The Source.Location, on the other hand, provides a means to identify the location of the media. Source.CodeLanguage is used to denote any computer languages used by the resource. The Source Metadata Set is illustrated in Figure 4-10.

![Figure 4-10 Source Metadata Set](image)

**Figure 4-10 Source Metadata Set**
4.10.1 Scope

Metacard Type: Resource Metacard (Core Layer)
Use Path(s): Resource.Source (see Resource Metadata Set)
Required: no
Schema: MSC-DMS-Resource

4.10.2 Table Format

Table 4-10a provides a description of the metadata components pertaining to the Source Metadata Set. Many of the metadata components used for the Source Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-10a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Rights component.</td>
<td>0..1</td>
<td>text</td>
<td>The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Format</td>
<td>The physical or digital manifestation of the Resource.</td>
<td>0..1</td>
<td></td>
<td>Derived from DDMS</td>
</tr>
<tr>
<td>mime type</td>
<td>The MIME type for the product object to which this metadata applies.</td>
<td>1</td>
<td>text</td>
<td>The Internet Source Type [MIME] of the Resource. The MIME type is expressed as: category/specific-type, such as &quot;image/gif&quot;. A comprehensive list of existing MIME types is available on the Internet at <a href="http://www.iana.org/assignments/media-types/">http://www.iana.org/assignments/media-types/</a>.</td>
</tr>
<tr>
<td>extent</td>
<td>A related data size, compression rate, or pixel size (etc.) of the Resource.</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| qualifier          | A vocabulary that specifies the type of format extent that will be supplied. | 0..1 | text | The qualifier attribute indicates the type of extent value listed.
  - In the case of data bytes, it may indicate 'byte size'.
  - In the case of a document length, it may indicate 'page count'.
  - In the case of streaming content, it may indicate 'bits per second' or 'frames per second'. |
<p>| value              | A related data size, compression rate, or pixel size (etc.) of the Resource. | 0..1 | text | |
| medium             | The physical medium or instantiation of the Resource. | 0..1 | text | Type used to model the medium attribute of the ddms:medium component |</p>
<table>
<thead>
<tr>
<th>CodeLanguage</th>
<th>The code language used to create the source asset</th>
<th>0..many</th>
<th>Ada</th>
<th>C/C++</th>
<th>C#</th>
<th>Fortran</th>
<th>HTML</th>
<th>Java</th>
<th>JavaScript</th>
<th>Objective-C</th>
<th>Pascal</th>
<th>PHP</th>
<th>SQL</th>
<th>XML</th>
<th>other</th>
<th>A pick list of enumerated values is provided to the create of the metacard, but other values can be entered.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>The location identifier address which may be used to access the information Resource content, e.g., a URI or file system location.</td>
<td>0..many</td>
<td>URI</td>
<td>Note: if a Location is not assigned, then the Title.documentIdentifier (found in Table 4-3a) should be present</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>This field provides an account of the media.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel -- Optional)</td>
<td>Section 4.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Source component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other media information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.10.3 Inclusion Criteria

The metadata components specified in Table 4-10a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 4.10.4 Example

Table 4-10b provides an example of a **Source** component that can be reflected within the metacard for an M&S Resource.
### Table 4-10b Source Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Values</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>mime type</td>
<td>Text/XML</td>
</tr>
<tr>
<td></td>
<td>extent</td>
<td>byte size</td>
</tr>
<tr>
<td></td>
<td>value</td>
<td>75000</td>
</tr>
<tr>
<td></td>
<td>medium</td>
<td>Digital</td>
</tr>
<tr>
<td></td>
<td>CodeLanguage</td>
<td>Java</td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td><a href="http://simmodelsrus.com/software">http://simmodelsrus.com/software</a></td>
</tr>
<tr>
<td>Description</td>
<td>Location</td>
<td><a href="http://www.simdeleverance.com">http://www.simdeleverance.com</a></td>
</tr>
<tr>
<td>Releasability</td>
<td>——see Table 4.23b for example</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>——see Table 4.24b for example</td>
<td></td>
</tr>
<tr>
<td>taxonomy</td>
<td>logistics_support</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Na</td>
<td></td>
</tr>
</tbody>
</table>

```xml
<ms:Source ms:taxonomy="logistics_support">
  <ms:Format>
    <ddms:mimeType>Text/XML/HTML</ddms:mimeType>
    <ddms:extent>
      <ddms:qualifier="byte size"/>
      <ddms:value="75000"/>
    </ddms:extent>
    <ddms:medium>digital</ddms:medium>
  </ms:Format>
  <ms:Format>
    <ddms:mimeType>String</ddms:mimeType>
    <ddms:extent>
      <ddms:qualifier="http://www.dms.gov/id=2348923498732"/>
    </ddms:extent>
    <ddms:medium>digital</ddms:medium>
  </ms:Format>
  <ms:CodeLanguage>Java</ms:CodeLanguage>
  <ms:Location>
    http://simmodelsrus.com/software/
  </ms:Location>
  <ms:Location>
    http://www.simdeleverance.com/
  </ms:Location>
  <ms:Description>Used with any Java VM</ms:Description>
  <ms:Releasability/>
  <ms:Security/>
</ms:Source>
```
4.11 Type Metadata Set

It is important to identify the Type of M&S Resource being cataloged. This section describes the Type Metadata Set for documenting the Resource Type as illustrated in Figure 4-11.

![Figure 4-11 Type Metadata Set](image)

4.11.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Core Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Type <em>(see Resource Metadata Set)</em></td>
</tr>
<tr>
<td>Required:</td>
<td>yes</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>

4.11.2 Table Format

Table 4-11a provides a description of the metadata components pertaining to the Type Metadata Set. Many of the metadata components used for the Type Metadata Set are leveraged from the DDMS; however, there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-11a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.
### Table 4-11a Type Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Type includes terms describing general categories, functions, genres, or aggregation levels for content.</td>
<td>1</td>
<td>software, tool, federation, software_component, service, data, data_model, interface_model_specification, resource_document, other_text</td>
<td>Recommended best practice is to select a value from a controlled vocabulary.</td>
</tr>
<tr>
<td>subtype</td>
<td>Identifies subtype of Resource.</td>
<td>0..1</td>
<td>text</td>
<td>Depends on Type value.</td>
</tr>
<tr>
<td>ads-designation</td>
<td>Identifies Authoritative Data Source Designation.</td>
<td>0..1</td>
<td>Category I, Category II, Category III, Authoritative - T, Approved - T, Other - T, other_text</td>
<td>A data source whose products have undergone producer data verification, validation, and certification activities.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Type component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22).</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other type information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

#### 4.11.3 Inclusion Criteria

The metadata components specified in Table 4-11a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

#### 4.11.4 Example

Table 4-11b provides an example of a **Type** component that can be reflected within the metacard for an M&S Resource.

### Table 4-11b Type Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Values</td>
</tr>
<tr>
<td>type</td>
<td>software_component,</td>
</tr>
<tr>
<td>subtype</td>
<td>C++</td>
</tr>
<tr>
<td>ads-designation</td>
<td>Category I</td>
</tr>
<tr>
<td>Releasability</td>
<td>—see Table 4.23b for example</td>
</tr>
<tr>
<td>Security</td>
<td>—see Table 4.24b for example</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>
4.12 POC Metadata Set

No matter what type of M&S Resource may be cataloged, invariably there are individuals or organizations that may be responsible for its development, management, or use. Therefore it is important to capture the essential components pertaining to such individuals and organizations that are responsible for an M&S Resource. This section describes the table formats identified for capturing details about a POC, or referencing a Contact metacard containing the POC information. There are other subcomponents used by the POC Metadata Set, which are also presented in Section 5. The POC Metadata Set is illustrated in Figure 4-12.
The POC Metadata Set described in this section is a component of the POCs Metadata Set, which is considered a container class. There may be 1..many occurrences of POC elements for the POCs container as specified in Table 4-1a.

### 4.12.1 Scope

**Metacard Type:** Resource Metacard (Core Layer)

**Use Path(s):** Resource.POCs (see Resource Metadata Set)

**Required:** yes (only if Resource.POCs has been declared)

**Schema:** MSC-DMS-Resource

### 4.12.2 Table Format

Table 4-12a provides a description of the metadata components pertaining to the POC Metadata Set information, which is an extension of the Contact Metadata Set. The difference between Contact Metadata Set and POC Metadata Set is that the POC Metadata Set allows a role to be identified, whereas Contact Metadata Set does not. Many of the metadata components used for the POC Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-12a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Metadata Component Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>role</td>
<td>This field specifies the role that the POC has with respect to the Resource Metacard.</td>
<td>0..1</td>
<td>primary author, contributor, publisher, proponent, sponsor, release authority, IP holder, copyright holder, technical POC, unspecified, other text</td>
<td>Prior to version 1.4 this originally was represented as an XML Element within a POC. Role is not supported by the Contact Metadata Set.</td>
</tr>
<tr>
<td>choice=Person</td>
<td>Specifies person.</td>
<td>0..1</td>
<td>-- see Person Metadata Set</td>
<td>Section 5.2</td>
</tr>
<tr>
<td>choice=PersonRef</td>
<td>Specifies reference to a person</td>
<td>0..1</td>
<td>-- see Person Metadata Set</td>
<td>Section 5.2</td>
</tr>
<tr>
<td>choice=Organization</td>
<td>Specifies organization.</td>
<td>0..1</td>
<td>-- see Organization Metadata Set</td>
<td>Section 5.3</td>
</tr>
<tr>
<td>choice=OrgRef</td>
<td>Specifies references to an organization</td>
<td>0..1</td>
<td>-- see Organization Metadata Set</td>
<td>Section 5.3</td>
</tr>
<tr>
<td>choice=Service</td>
<td>Specifies service</td>
<td>0..1</td>
<td>-- see Organization Metadata Set</td>
<td>Section 5.3</td>
</tr>
<tr>
<td>Description</td>
<td>This field provides an account of the POC.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the POC information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the POC information.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>Image</td>
<td>Allows an image to be identified with the POC.</td>
<td>0..1</td>
<td>-- see Image Metadata Set</td>
<td>Section 4.14</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource Metacard.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>
4.12.3 Inclusion Criteria

The metadata components specified in Table 4-12a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.12.4 Example

A POC is reflective of either a Person or an Organization. It must be one or the other for each POC. Table 4-12b provides an example of a POC.Person component that can be reflected within the metacard for an M&S Resource. The Person Metadata Set used to fill out a Resource POC is provided by the Contact Metadata Set and is described in section 5.2

Table 4-12b POC.Person Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>role Person</td>
<td>technical POC</td>
</tr>
<tr>
<td>personID</td>
<td>231</td>
</tr>
<tr>
<td>supervisorID</td>
<td>230</td>
</tr>
<tr>
<td>sponsorID</td>
<td>332</td>
</tr>
<tr>
<td>Name</td>
<td>Mr.</td>
</tr>
<tr>
<td>first</td>
<td>John</td>
</tr>
<tr>
<td>middle</td>
<td>Michael</td>
</tr>
<tr>
<td>last</td>
<td>Davidson</td>
</tr>
<tr>
<td>Organization</td>
<td>Sprocket Sim</td>
</tr>
<tr>
<td>position</td>
<td>Developer</td>
</tr>
<tr>
<td>JobTitle</td>
<td>System Engineer</td>
</tr>
<tr>
<td>Address Info</td>
<td>123 Jetway Drive</td>
</tr>
<tr>
<td>Address Line 2</td>
<td>Suite</td>
</tr>
<tr>
<td>Address Line 3</td>
<td>ATTN: John Davidson</td>
</tr>
<tr>
<td>City</td>
<td>Alexandria</td>
</tr>
<tr>
<td>State</td>
<td>Virginia</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td>Postal Code</td>
<td>22308</td>
</tr>
<tr>
<td>Phone</td>
<td>Work</td>
</tr>
<tr>
<td>number</td>
<td>703-360-3767</td>
</tr>
<tr>
<td>extension</td>
<td>351</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:jdavidson@sprocketsim.com">jdavidson@sprocketsim.com</a></td>
</tr>
<tr>
<td>WebAddress</td>
<td><a href="http://www.sprocketsim.com">http://www.sprocketsim.com</a></td>
</tr>
<tr>
<td>ContactInstruction</td>
<td>Leave message at help desk if no answer</td>
</tr>
<tr>
<td>Description</td>
<td>The chief architect of the model</td>
</tr>
<tr>
<td>Role</td>
<td>technical POC</td>
</tr>
<tr>
<td>Releasability</td>
<td>-- see Releasability Metadata Set for example</td>
</tr>
<tr>
<td>Security</td>
<td>-- see Security Metadata Set for example</td>
</tr>
<tr>
<td>Image</td>
<td>-- see Image Metadata Set for example</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>

-- see Releasability Metadata Set for example
-- see Security Metadata Set for example
-- see Image Metadata Set for example
Table 4-12c provides an example of a **POC.Organization** component that can be reflected within the metacard for an M&S Resource. The Organization Metadata used to fill out a Resource POC is provided by the Contact Metadata Set and is described in section 5.2

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td><strong>role</strong></td>
<td>contributor</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td></td>
</tr>
<tr>
<td><strong>organizationID</strong></td>
<td>256</td>
</tr>
<tr>
<td><strong>parentID</strong></td>
<td>255</td>
</tr>
<tr>
<td><strong>Name</strong></td>
<td>SprocketSim, Inc</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Industry</td>
</tr>
<tr>
<td><strong>Address Info</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Address Line 1</strong></td>
<td>123 Jetway Drive</td>
</tr>
<tr>
<td><strong>Address Line 2</strong></td>
<td>Suite 5</td>
</tr>
<tr>
<td><strong>Address Line 3</strong></td>
<td>ATTN: John Davidson</td>
</tr>
<tr>
<td><strong>City</strong></td>
<td>Alexandria</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>Virginia</td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td>USA</td>
</tr>
<tr>
<td><strong>Postal Code</strong></td>
<td>22308</td>
</tr>
<tr>
<td><strong>Phone</strong></td>
<td></td>
</tr>
<tr>
<td><strong>type</strong></td>
<td>work</td>
</tr>
<tr>
<td><strong>number</strong></td>
<td>703-360-3767</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td></td>
</tr>
<tr>
<td><strong>type</strong></td>
<td>Work</td>
</tr>
<tr>
<td><strong>address</strong></td>
<td><a href="mailto:jdavidson@sprocketsim.com">jdavidson@sprocketsim.com</a></td>
</tr>
<tr>
<td><strong>WebAddress</strong></td>
<td><a href="http://www.sprocketsim.com">http://www.sprocketsim.com</a></td>
</tr>
<tr>
<td><strong>ContactInstruction</strong></td>
<td>contact John Davidson</td>
</tr>
<tr>
<td><strong>ContactInstruction</strong></td>
<td>For general assistance, dial 0 for an operator.</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The chief architect of the model</td>
</tr>
<tr>
<td><strong>Releasability</strong></td>
<td>-- see Releasability Metadata Set for example</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>-- see Security Metadata Set for example</td>
</tr>
<tr>
<td><strong>Image</strong></td>
<td>-- see Image Metadata Set for example</td>
</tr>
<tr>
<td><strong>other</strong></td>
<td>na</td>
</tr>
</tbody>
</table>

---

Table 4-12c POC.Organization Metadata Example
4.13 Keyword Metadata Set

Typically, a Resource can be tagged by a set of keywords or key phrases or classification codes that describe a topic of an M&S Resource. The Keywords component provides a means to reflect a keyword that applies to the resource, or a particular subject category, which will aid the user in understanding the genre of the content. This section describes the table format identified for documenting a Keyword. This is illustrated in Figure 4-13.

The Keyword Metadata Set described in this section is a component of the Keywords Metadata Set, which is considered a container class. There may be 1..many occurrences of Keyword elements for the Keywords container as specified in Table 4-1a.

4.13.1 Scope

Metacard Type: Resource Metacard (Core Layer)
Use Path(s): Resource.Keywords.Keyword (see Resource Metadata Set)
Required: yes (if only Resource.Keywords has been declared)
Schema: MSC-DMS-Resource

4.13.2 Table Format

Table 4-13a provides a description of the metadata components pertaining to the Keyword Metadata Set, which is leveraged by the Resource.Keywords.Keyword component within the Resource Metadata Set. Many of the metadata components used for the Keyword Metadata Set are leveraged from the Source component of the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-
13a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

### Table 4-13a Keyword Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>This field specifies the word or concept that is addressed by the Resource.</td>
<td>1</td>
<td>text</td>
<td>The value for a keyword must be supplied. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Keyword component.</td>
<td>0..1</td>
<td>text</td>
<td>The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16). If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>--</td>
<td>-- see Releasability Metadata Set Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the title information.</td>
<td>0..1</td>
<td>--</td>
<td>-- see Security Metadata Set (Sublevel – Optional) Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme. The Keyword Metadata Set provides a means to identify both the keywords or phrase values, and a taxonomy identifying the controlled vocabulary or formal classification scheme.

#### 4.13.3 Inclusion Criteria

The metadata components specified in Table 4-13a are necessary for all components of this metadata set unless “0..1” is identified in the Occurs column.

#### 4.13.4 Example

Table 4-13b provides an example of a Keyword component that can be reflected within the metacard for an M&S Resource.

### Table 4-13b Keyword Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>taxonomy</td>
<td>missile_defense</td>
</tr>
<tr>
<td>value</td>
<td>simulation</td>
</tr>
</tbody>
</table>

The location for taxonomy can be looked up via the Related Taxonomies table, which is described by the Related Taxonomies Metadata Set.
4.14 Image Metadata Set

It is often helpful to visually tag Resources so that they can be more easily identified. The Image component provides a means to associate a visual image with an M&S Resource. This section describes the table format identified for documenting an image. The Image Metadata Set is illustrated in Figure 4-14.

![Figure 4-14 Image Metadata Set](image)

4.14.1 Scope

**Metacard Type:** Resource Metacard (Core Layer)

**Use Path(s):**
- Resource.Image (see Resource Metadata Set)
- Resource.POCs.POC.Person.Image (see POC Metadata Set)
- Contact.Person.Image (see Contact Metadata Set)

**Required:** no

**Schema:** MSC-DMS-Resource

4.14.2 Table Format

Table 4-14a provides a description of the metadata components pertaining to the Image Metadata Set, which is leveraged by the Image component within the Resource Metadata Set. The metadata components used for the Image Metadata Set are leveraged from the HLA Object Model Template (OMT) and Base Object Model (BOM) Specification. Italics are used in the Values column of Table 4-14a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.
Table 4-14a Image Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>src</td>
<td>Specifies the location for the image</td>
<td>1</td>
<td>anyURI</td>
<td>Location described using a URI.</td>
</tr>
<tr>
<td>type</td>
<td>This field holds the image type being represented.</td>
<td>1</td>
<td>BMP, GIF, JPG, PNG, TIFF, other text</td>
<td></td>
</tr>
<tr>
<td>height</td>
<td>This field specifies the pixel height of the image represented in the Image field.</td>
<td>0..1</td>
<td>short</td>
<td></td>
</tr>
<tr>
<td>width</td>
<td>This field specifies the pixel width of the image represented in the Image field.</td>
<td>0..1</td>
<td>short</td>
<td></td>
</tr>
<tr>
<td>alt</td>
<td>This field specifies an alternative text in case the image represented in the Image field cannot be displayed.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set Section 4.23</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the title information.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel--Optional) Section 4.24</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other Image information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.14.3 Inclusion Criteria

The metadata components specified in Table 4-14a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.14.4 Example

Table 4-14b provides an example of an Image component that can be reflected within the metacard for an M&S Resource.

Table 4-14b Image Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>src</td>
<td>&quot;<a href="http://www.simrus.com/missile.jpg">http://www.simrus.com/missile.jpg</a>&quot;</td>
</tr>
<tr>
<td>type</td>
<td>JPG</td>
</tr>
<tr>
<td>alt</td>
<td>Ballistic Algo</td>
</tr>
<tr>
<td>height</td>
<td>32</td>
</tr>
<tr>
<td>width</td>
<td>32</td>
</tr>
<tr>
<td>Releasability</td>
<td>-- see Releasability Metadata Set for example</td>
</tr>
<tr>
<td>Security</td>
<td>-- see Security Metadata Set for example</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>

<ms:Image
  ms:src="http://www.simrus.com/missile.jpg"
  ms:type="JPG"
  ms:alt="Ballistic Algo"
  ms:height="32"
  ms:width="32"/>
4.15 Virtual Coverage Metadata Set

Virtual Coverage identifies subject-matter coverage of an M&S Resource in terms of one or more virtual addresses. For this purpose, a “virtual” address is a computer network address, expressed as a set of Internet Protocol (IP) octets, a uniform Resource locator (URL), or some other network-addressing scheme, such as a network name or locale. The Virtual Coverage Metadata Set is illustrated in Figure 4-15.

Figure 4-15 Virtual Coverage Metadata Set

The Virtual Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..many occurrences of VirtualCoverage elements for the Supplemental Extensions container as specified in Table 4-1a.

4.15.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Supplemental Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Extensions.VirtualCoverage (see Resource Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>no</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>

4.15.2 Table Format

Table 4-15a provides a description of the metadata components pertaining to the Virtual Coverage Metadata Set, which is leveraged by the VirtualCoverage component within the Resource Metadata Set. Many of the metadata components used for the Virtual Coverage Metadata Set are leveraged
from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-15a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

Table 4-15a Virtual Coverage Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>protocol</td>
<td>The type of rules for data transfer that apply to the Virtual Address.</td>
<td>0..1</td>
<td>text</td>
<td>TCP, UDP, http, etc. For clarity within the text, a ‘hashtag value in the form #word’ can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>address</td>
<td>A computer or telecommunications network address, or a network name or locale.</td>
<td>0..1</td>
<td>text</td>
<td>The form of this will depend on the network protocol in use; whether a specific node or an entire subnet is being addressed, etc. Examples of virtual addresses are Internet protocol (IP) octets and uniform Resource locators (URLs), or a network name or locale.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Virtual Coverage component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Description</td>
<td>Information further describing this virtual coverage</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a ‘hashtag value in the form #word’ can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set Section 4.23</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional) Section 4.24</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.15.3 Inclusion Criteria

The metadata components specified in Table 4-15a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.15.4 Example

Table 4-15b provides an example of a VirtualCoverage component that can be reflected within the metacard for an M&S Resource.

Table 4-15b Virtual Coverage Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Address</td>
<td>123.456.789.101</td>
<td><a href="">ms:VirtualCoverage</a></td>
</tr>
<tr>
<td>Network Protocol</td>
<td>TCP/IP</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="">ddms:address</a>123.456.789.101&lt;/ddms:address&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="">ddms:protocol</a>TCP/IP&lt;/ddms:protocol&gt;</td>
<td></td>
</tr>
</tbody>
</table>
4.16 Temporal Coverage Metadata Set

Temporal Coverage identifies periods of time associated to a Resource. For example, a data set such as weather, which may be used in a simulation, pertaining to a certain period of time and therefore it must be properly marked. The Temporal Coverage Metadata Set is illustrated in Figure 4-16.

![Figure 4-16 Temporal Coverage Metadata Set](image)

The Temporal Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..many occurrences of TemporalCoverage elements for the Supplemental Extensions container as specified in Table 4-1a.

4.16.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Supplemental Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Extensions.TemporalCoverage (see Resource Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>no</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>

4.16.2 Table Format

Table 4-16a provides a description of the metadata components pertaining to the Temporal Coverage Metadata Set, which is leveraged by the TemporalCoverage component within the
Resource Extensions Metadata Set. Many of the metadata components used for the Temporal Coverage Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-16a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

Table 4-16a Temporal Coverage Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Temporal Coverage component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>name</td>
<td>A name to identify time period / era.</td>
<td>0..1</td>
<td>text</td>
<td>The default value for Time Period is &quot;unknown.&quot;</td>
</tr>
<tr>
<td>start</td>
<td>The start date of a period of time.</td>
<td>1</td>
<td>text</td>
<td>The default value for Date Start is &quot;unknown.&quot;</td>
</tr>
<tr>
<td>end</td>
<td>The end date of a period of time.</td>
<td>1</td>
<td>text</td>
<td>The default value for Date End is &quot;unknown.&quot;</td>
</tr>
<tr>
<td>Description</td>
<td>Information about the temporal coverage</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.16.3 Inclusion Criteria

The metadata components specified in Table 4-16a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.16.4 Example

Table 4-16b provides an example of a TemporalCoverage component that can be reflected within the metacard for an M&S Resource.

Table 4-16b Temporal Coverage Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>GMT Start</td>
<td><code>&lt;ms:name&gt;GMT Start&lt;/ms:name&gt;</code></td>
</tr>
<tr>
<td>Start</td>
<td>2001-12-17T08:30:46.0Z</td>
<td><code>&lt;ms:start&gt;2001-12-17T08:30:46.0Z&lt;/ms:start&gt;</code></td>
</tr>
<tr>
<td>End</td>
<td>2004-09-17T08:36:56.0Z</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Start time for Exercise A1</td>
<td></td>
</tr>
</tbody>
</table>

<ms:Description>Start time for Exercise A1</Description>
</ms:TemporalCoverage>
4.17 Geospatial Coverage Metadata Set

M&S Resources may also need to be tagged with a geographical location that relate to the Resource, such as a jurisdiction, point, area, or volume on land, in space, or at sea. An example of this is a weather dataset, or a terrain database used for the purposes of M&S exercises. The Geospatial Coverage Metadata Set is illustrated in Figure 4-17.

![Geospatial Coverage Metadata Set Diagram](image)

Figure 4-17 Geospatial Coverage Metadata Set

The Geospatial Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..many occurrences of GeospatialCoverage elements for the Supplemental Extensions container as specified in Table 4-1a.

4.17.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Resource Metacard (Supplemental Layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Resource.Extensions.GeospatialCoverage (see Resource Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>no</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Resource</td>
</tr>
</tbody>
</table>
4.17.2 Table Format

Table 4-17a provides a description of the metadata components pertaining to the Geospatial Coverage Metadata Set, which is leveraged by the GeospatialCoverage component within the Resource Extensions Metadata Set. Many of the metadata components used for the Geospatial Coverage Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 4-17a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Identifier</td>
<td>Identifier associated with Geospatial content if applicable.</td>
<td>0..1</td>
<td></td>
<td>This component must contain one or more name, region, country code or facility identifier components.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of a place of interest, other than a country, region, or facility.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Region</td>
<td>The name of a sub-national or transnational geographic or geopolitical region that is a subject of the Resource.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Country Code</td>
<td>A standards-based abbreviation of a country name.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>qualifier</td>
<td>A vocabulary that specifies the type of that will be supplied.</td>
<td>0..1</td>
<td>text</td>
<td>The qualifier attribute indicates the type of extent value listed. In the case of data bytes, it may indicate ‘byte size’. In the case of a document length, it may indicate ‘page count’. In the case of streaming content, it may indicate ‘bits per second’ or ‘frames per second’.</td>
</tr>
<tr>
<td>value</td>
<td>A standards-based abbreviation of a country name.</td>
<td>0..1</td>
<td>text</td>
<td>A permissible value according to the vocabulary specified in Country Code qualifier.</td>
</tr>
<tr>
<td>Subdivision Code</td>
<td>An element under geographicIdentifier that is a qualified abbreviation of a region that is not expressed in country code.</td>
<td>1</td>
<td></td>
<td>This element can be used to describe such areas that are smaller areas within countries, such as states or provinces. Acceptable values should indicate code vocabularies from acceptable controlled vocabulary codes defining sub divisions, such as the ISO 3166-2 that defines sub division codes.</td>
</tr>
<tr>
<td>qualifier</td>
<td>An attribute of subdivisionCode that is a vocabulary notation specifying the source of the country abbreviations.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>value</td>
<td>An attribute of subdivisionCode that is a standards-based abbreviation of a country name.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Facility Identifier</td>
<td>A specific identification number or point location of a facility or installation.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beNumber</td>
<td>A DIA-specific identification number of a facility or installation according to a grid location system.</td>
<td>0..1</td>
<td>text</td>
<td>See DDMS</td>
</tr>
<tr>
<td>osuffix</td>
<td>A specific identification number for a facility located at the installation associated by the Facility BE Number.</td>
<td>0..1</td>
<td>text</td>
<td>See DDMS</td>
</tr>
</tbody>
</table>
### Bounding Box
A wrapper for components containing the bounding longitudes and latitudes for describing a geographic extent. See also ISO 19115.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WestBL</td>
<td>The westernmost longitude of the area of interest.</td>
<td>double</td>
<td>1</td>
<td>This component is mandatory if the Geographic Bounding Box is being used to specify a geospatial area of interest. It is recommended that the latitudes and longitudes be expressed in decimal degrees in order to provide a standard representation. This component must use the WGS-84 Coordinate Reference System.</td>
</tr>
<tr>
<td>EastBL</td>
<td>The easternmost longitude of the area of interest</td>
<td>double</td>
<td>1</td>
<td>This component is mandatory if the Geographic Bounding Box is being used to specify a geospatial area of interest. It is recommended that the latitudes and longitudes be expressed in decimal degrees in order to provide a standard representation. This component must use the WGS-84 Coordinate Reference System.</td>
</tr>
<tr>
<td>SouthBL</td>
<td>The southernmost latitude of the area of interest.</td>
<td>double</td>
<td>1</td>
<td>This component is mandatory if the Geographic Bounding Box is being used to specify a geospatial area of interest. It is recommended that the latitudes and longitudes be expressed in decimal degrees in order to provide a standard representation. This component must use the WGS-84 Coordinate Reference System.</td>
</tr>
<tr>
<td>NorthBL</td>
<td>The northernmost latitude of the area of interest.</td>
<td>double</td>
<td>1</td>
<td>This component is mandatory if the Geographic Bounding Box is being used to specify a geospatial area of interest. It is recommended that the latitudes and longitudes be expressed in decimal degrees in order to provide a standard representation. This component must use the WGS-84 Coordinate Reference System.</td>
</tr>
<tr>
<td>Geographic Bounding Geometry</td>
<td>One or more Polygons and Points.</td>
<td>0..1</td>
<td></td>
<td>This component must contain either a gml:Point or gml:Polygon component. This component must also be used in instances where a bounding polygon is to be specified using a Coordinate Reference System other than WGS-84.</td>
</tr>
</tbody>
</table>

### Polygon
Specifies a position using a list of coordinates that define the boundary for the geographic extent. See also ISO 19136.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygon</td>
<td>The gml:Polygon component is used to describe a closed, geographic area using a list of coordinates (the exterior ring). Exterior rings are specified within LinearRing subcomponents that contain 4 or more gml:pos components used to mark the control points of the polygon. To close the polygon it is necessary that the last coordinate be the same as the first. The gml:Polygon component uses the gml:SRSReferenceGroupSRSNameRequired to provide a set of common attributes to indicate the spatial reference system for the coordinates.</td>
<td>PolygonType</td>
<td>1..many</td>
<td></td>
</tr>
</tbody>
</table>

### Point
Specifies a position using a single coordinate tuple. See also ISO 19136.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>The gml:Point component is used to specify a position using coordinates. The gml:Point component uses the gml:SRSReferenceGroupSRSNameRequired to provide a set of common attributes to indicate the spatial reference system for the coordinates.</td>
<td>PointType</td>
<td>1..many</td>
<td></td>
</tr>
</tbody>
</table>

### Postal Address
A wrapper for postal address components including street, city, state or province, postal code, and country code.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postal Address</td>
<td>See Street, City, State, Province, Postal Code, and Country Code components.</td>
<td></td>
<td>0..1</td>
<td></td>
</tr>
</tbody>
</table>

### Street
A line of a postal address.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street</td>
<td>Use for street number and name, or PO box number, or attention line, or department name. Do not use for city, state, or province name, or for the postal code.</td>
<td>text</td>
<td>0..8</td>
<td></td>
</tr>
</tbody>
</table>

### City
A city name.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Type</th>
<th>Cardinality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td></td>
<td>text</td>
<td>0..1</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
<td>Occurs</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>State/Province</td>
<td>An abbreviation of a state/province.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Postal Code</td>
<td>A mailing code designation, such as a ZIP code in the U.S. or a postcode in Britain.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Country Code</td>
<td>A standards-based abbreviation of a country name.</td>
<td>0..1</td>
<td>&lt;enumerated list&gt;</td>
<td></td>
</tr>
<tr>
<td>Vertical Extent</td>
<td>A wrapper for child components used to describe the vertical extent applicable to the Resource.</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit Of Measure</td>
<td>A wrapper component used to describe the extent applicable to the Resource.</td>
<td>1</td>
<td>LengthMeasureType</td>
<td></td>
</tr>
<tr>
<td>datum</td>
<td>A wrapper component used to describe the extent applicable to the Resource.</td>
<td>1</td>
<td>VerticalDatumType</td>
<td></td>
</tr>
<tr>
<td>Minimum Vertical Extent</td>
<td>The lowest vertical point within the coverage.</td>
<td>1</td>
<td>VerticalDistanceType</td>
<td></td>
</tr>
<tr>
<td>Maximum Vertical Extent</td>
<td>The highest vertical point within the coverage.</td>
<td>1</td>
<td>VerticalDistanceType</td>
<td></td>
</tr>
<tr>
<td>precedence</td>
<td>Priority claimed or received as a result of preeminence. When used on the element CountryCode, this attribute is used to distinguish the primary focus when an intelligence product covers two or more countries. Permissible values are Primary, Secondary.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>order</td>
<td>Specifies a user-defined order of an element within the given document. All elements in the document which specify the order attribute should be interpreted as entries in a single, ordered list even though they may appear on different elements. Values must be sequential, starting at 1, and may not contain duplicates.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Geospatial Coverage component.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Information about the geospatial coverage.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set Section 4.23</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional), Section 4.24</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

### 4.17.3 Inclusion Criteria

The metadata components specified in Table 4-38 are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.
4.17.4 Example

Table 4-17b provides an example of a **GeospatialCoverage** component that can be reflected within the metacard for an M&S Resource.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Identifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>The White House</td>
<td><code>&lt;ms:GeospatialCoverage&gt;</code></td>
</tr>
<tr>
<td>Region</td>
<td>Mid-Atlantic</td>
<td><code>&lt;ddms:GeospatialExtent&gt;</code></td>
</tr>
<tr>
<td>Geographic Bounding Box</td>
<td></td>
<td><code>&lt;ddms:geographicIdentifier&gt;</code></td>
</tr>
<tr>
<td>WestBL</td>
<td>39</td>
<td><code>&lt;ddms:name&gt;The White House&lt;/ddms:name&gt;</code></td>
</tr>
<tr>
<td>EastBL</td>
<td>48</td>
<td><code>&lt;ddms:name&gt;Mid-Atlantic&lt;/ddms:name&gt;</code></td>
</tr>
<tr>
<td>SouthBL</td>
<td>29</td>
<td><code>&lt;ddms:boundingBox&gt;</code></td>
</tr>
<tr>
<td>NorthBL</td>
<td>38</td>
<td><code>&lt;ddms:WestBL&gt;39&lt;/ddms:WestBL&gt;</code></td>
</tr>
<tr>
<td>Geographic Bounding Geometry</td>
<td></td>
<td><code>&lt;ddms:EastBL&gt;48&lt;/ddms:EastBL&gt;</code></td>
</tr>
<tr>
<td>Polygon</td>
<td></td>
<td><code>&lt;ddms:SouthBL&gt;29&lt;/ddms:SouthBL&gt;</code></td>
</tr>
<tr>
<td>Name</td>
<td><a href="http://metadata.dod.mil/mdr/ns/GSIP/crs/WGS84_2D">http://metadata.dod.mil/mdr/ns/GSIP/crs/WGS84_2D</a></td>
<td><code>&lt;ddms:NorthBL&gt;38&lt;/ddms:NorthBL&gt;</code></td>
</tr>
<tr>
<td>Postal Address</td>
<td>1600 Pennsylvania Avenue NW</td>
<td><code>&lt;ddms:boundingBox&gt;</code></td>
</tr>
<tr>
<td>City</td>
<td>Washington</td>
<td><code>&lt;ddms:WestBL&gt;39&lt;/ddms:WestBL&gt;</code></td>
</tr>
<tr>
<td>State</td>
<td>D.C.</td>
<td><code>&lt;ddms:EastBL&gt;48&lt;/ddms:EastBL&gt;</code></td>
</tr>
<tr>
<td>Postal Code</td>
<td>20500</td>
<td><code>&lt;ddms:SouthBL&gt;29&lt;/ddms:SouthBL&gt;</code></td>
</tr>
<tr>
<td>Country Code</td>
<td>USA</td>
<td><code>&lt;ddms:NorthBL&gt;38&lt;/ddms:NorthBL&gt;</code></td>
</tr>
<tr>
<td>Vertical Extent</td>
<td></td>
<td><code>&lt;ddms:boundingBox&gt;</code></td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>Meter</td>
<td><code>&lt;ddms:VerticalExtent&gt;</code></td>
</tr>
<tr>
<td>Datum</td>
<td>AGL</td>
<td><code>&lt;ddms:MinimumVerticalExtent&gt;0&lt;/ddms:MinimumVerticalExtent&gt;</code></td>
</tr>
<tr>
<td>Vertical Extent</td>
<td></td>
<td><code>&lt;ddms:MaximumVerticalExtent&gt;100&lt;/ddms:MaximumVerticalExtent&gt;</code></td>
</tr>
</tbody>
</table>

Table 4-17b Geospatial Coverage Example
4.18 HLA Coverage Metadata Set

Many M&S Resources that are developed and intended for reuse include simulations. For such Resources that are HLA compliant, it is important to understand what HLA capabilities a resource may possess. The HLA Coverage Metadata Set is illustrated in Figure 4-18.

The HLA Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..1 occurrences of HLACoverage elements for the Supplemental Extensions container as specified in Table 4-1a.
### 4.18.1 Scope

**Metacard Type:** Resource Metacard (Supplemental Layer)  
**Use Path(s):** Resource.Extensions.HLACoverage (see Resource Metadata Set)  
**Required:** no  
**Schema:** MSC-DMS-Resource

### 4.18.2 Table Format

Table 4-18a provides a description of the metadata components pertaining to the HLA Coverage Metadata Set, which is leveraged by the HLACoverage component within the Resource Metadata Set. Many of the metadata components used for the HLA Coverage Metadata Set are leveraged from the various service MSRRs. Italics are used in the Values column of Table 4-18a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

#### Table 4-18a HLA Coverage Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>Identifiers certification level in respect to HLA.</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>certifed</td>
<td>Identifies if the resource has been HLA Certified</td>
<td>1</td>
<td>yes, no, waived</td>
<td>Identifies whether or not Resource was waived from HLA compliance.</td>
</tr>
<tr>
<td>level</td>
<td>Identifies level of certification</td>
<td>0..1</td>
<td>text</td>
<td>Only filled in if “certified” is yes for clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Date</td>
<td>Specifies date of HLA compliance</td>
<td>1</td>
<td>date</td>
<td></td>
</tr>
<tr>
<td>Fom Som Used</td>
<td>Specifies what FOM or SOMs are used.</td>
<td>0..*</td>
<td>FOM = Federation Object Model, SOM = Simulation Object Model</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Specifies the FOM or SOM name</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Fom Som URL</td>
<td>Specifies location of FOM or SOM used.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the HLA Coverage component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.16) If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>
4.18.3 Inclusion Criteria

The metadata components specified in Table 4-18a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.18.4 Example

Table 4-18b provides an example of a HLA Coverage component that can be reflected within the metacard for an M&S Resource.

**Table 4-18b HLA Coverage Metadata Example**

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>Certification</td>
<td>yes</td>
</tr>
<tr>
<td>level</td>
<td>Certified with IEEE 1516</td>
</tr>
<tr>
<td>Date</td>
<td>2005-10-23</td>
</tr>
<tr>
<td>Fom Som Used</td>
<td>RPR FOM</td>
</tr>
<tr>
<td>Fom Som URL</td>
<td><a href="http://www.sisostds.org">www.sisostds.org</a></td>
</tr>
</tbody>
</table>
4.19 VV&A Coverage Metadata Set

Resources often go through a process of verification, validation, and accreditation (VV&A) to provide evidence and confidence in the use of that resource for some intended purpose. Therefore, it is important to reflect the VV&A information pertaining to an M&S Resource.

A particular M&S Resource may undergo a variety of VV&A activities related to various intended uses. These activities can result in numerous VV&A documents, including such items as an Accreditation Plan, Verification and Validation (V&V) Plan, V&V Report, and Accreditation Report. The VV&A Coverage Metadata Set supports description of a VV&A documentation project as well as individual VV&A documents that are produced by a project. The VV&A Metadata Set illustrated in Figure 4-19.

![Figure 4-19 VV&A Metadata Set](image-url)
The VV&A Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..1 occurrences of VVACoverage elements for the Supplemental Extensions container as specified in Table 4-1a.

### 4.19.1 Scope

**Metacard Type:** Resource Metacard (Supplemental Layer)

**Use Path(s):** Resource.Extensions.VVACoverage *(see Resource Metadata Set)*

**Required:** no

**Schema:** MSC-DMS-Resource

### 4.19.2 Table Format

Table 4-19a provides a description of the metadata components pertaining to the VV&A Coverage Metadata Set, which is leveraged by the VVACoverage component within the Resource Metadata Set. Italics are used in the Values column of Table 4-19a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

**Table 4-19a VV&A Coverage Metadata Set**

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Type of VV&amp;A Coverage. Here, it denotes that the Resource information describes a VV&amp;A documentation project.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>value</td>
<td>Value associated to type</td>
<td>0..1</td>
<td>text</td>
<td>VV&amp;A Documentation (Project Level Metadata Supplement)</td>
</tr>
<tr>
<td>subtype</td>
<td>Type of VV&amp;A document described by this metadata.</td>
<td>0..1</td>
<td>Accreditation Plan, V&amp;V Plan, V&amp;V Report, Accreditation Report, Accreditation Decision Letter</td>
<td>(Document Level Metadata Supplement)</td>
</tr>
<tr>
<td>ADS Designation</td>
<td>Identifies Authoritative Data Source Designation.</td>
<td>0..1</td>
<td>Category I, Category II, Category III, Authoritative - T, Approved - T, Other – T, other text</td>
<td>A data source whose products have undergone producer data verification, validation, and certification activities.</td>
</tr>
<tr>
<td>IntendedUse.value</td>
<td>Description of the intended use of the M&amp;S system. Helps define the context and scope of the VV&amp;A documentation effort.</td>
<td>1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>MSSystem.value</td>
<td>Name of the M&amp;S System that is being addressed by the VV&amp;A document described as an M&amp;S Resource.</td>
<td>1</td>
<td>text</td>
<td>VV&amp;A documents describe planning and execution of VV&amp;A processes in the context of a particular M&amp;S system. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>ExecutiveSummary.value</td>
<td>Executive Summary from the VV&amp;A document providing an</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word</td>
</tr>
</tbody>
</table>

---

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overview of the document, including synopsis of the major components from all sections of the document, with emphasis on the scope of the respective VV&A activity, M&S requirements, acceptability criteria, methodology of the respective VV&A activity, and issues of the respective VV&A activity.

can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.

<table>
<thead>
<tr>
<th>POCRef</th>
<th>Contact information on other individuals who can provide information about the VV&amp;A document or can provide access to the VV&amp;A document.</th>
<th>1..many -- see how it is specified in Rights Metadata Set</th>
<th>Identifies a POC reference including id and name</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the VV&amp;A Coverage component.</td>
<td>0..1 text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 5.17). If a taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1 -- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1 -- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many any</td>
<td></td>
</tr>
</tbody>
</table>

4.19.3 Inclusion Criteria

The metadata components specified in Table 4-19a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.19.4 Example

Table 4-19b provides an example of a VVACoverage component that can be reflected within the metacard for an M&S Resource.

Table 4-19b VV&A Coverage Metadata Example (Document-Level Metadata)

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>Type.value</td>
<td>VV&amp;A Documentation</td>
</tr>
<tr>
<td>Type.subtype</td>
<td>Accreditation Report</td>
</tr>
<tr>
<td>Type.ads-designation</td>
<td>Category I</td>
</tr>
<tr>
<td>IntendedUse</td>
<td>Training Army brigade command staff future planning cell personnel in the rapid decision-making process.</td>
</tr>
<tr>
<td>MSSystem</td>
<td>RDMP Trainer</td>
</tr>
<tr>
<td>ExecutiveSummary</td>
<td>text excerpt from the Executive Summary section of the Accreditation Report providing an overview of the document (omitted here to conserve space in the table)</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>POCref</td>
<td></td>
</tr>
<tr>
<td>.personID</td>
<td>345</td>
</tr>
<tr>
<td>.Name</td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>Samuel</td>
</tr>
<tr>
<td>.middle</td>
<td>Albert</td>
</tr>
<tr>
<td>.last</td>
<td>Drake</td>
</tr>
</tbody>
</table>

```xml
<ms:MSysName ms:value="RDMP Trainer"/>
<ms:ExecSumm ms:value="text excerpt from the Executive Summary section of the Accreditation Report providing an overview of the document (omitted here to conserve space in the table)">
  <ms:POCref>
    <ms:Person ms:personID="345">
      <ms:Name ms:firstName="Samuel"
               ms:middleName="Albert"
               ms:lastName="Drake"/>
    </ms:Person>
  </ms:POCref>
</ms:ExecSumm>
```
4.20 Resource Management Metadata Set

Resources often go through a process of configuration management as updates and revisions are made. It is often important to track and maintain an account of such updates. The Resource Management Metadata Set supports description of the Resource Management documentation project as well as individual VV&A documents that are produced by a project. The Resource Management Metadata Set, which in previous versions was called Configuration Management, is illustrated in Figure 4-20.

The Resource Management Coverage Metadata Set described in this section is a component of the Supplemental Extensions Metadata Set, which is considered a container class. There may be 0..1 occurrences of ResourceManagement elements for the Supplemental Extensions container as specified in Table 4-1a.
4.20.1 Scope

Metacard Type: Resource Metacard (Supplemental Layer)
Use Path(s): Resource.Extensions.ResourceManagement (see Resource Metadata Set)
Required: no
Schema: MSC-DMS-Resource

4.20.2 Table Format

Table 4-20a provides a description of the metadata components pertaining to the Configuration Management Metadata Set, which is leveraged by the ResourceManagement component within the Resource Metadata Set. Italics are used in the Values column of Table 4-20a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Type of infrastructure / body responsible for configuration management.</td>
<td>1</td>
<td>User Group CCB Executive Steering Committee None text</td>
<td></td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Configuration Management component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22). If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the title information.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td>Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Resource.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td>Section 4.24</td>
</tr>
<tr>
<td>Description</td>
<td>Open narrative used to increase comprehension pertaining to the metadata component.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>POCref</td>
<td>Contact information on other individuals who can provide information about the configuration management.</td>
<td>1..many</td>
<td>-- see how it is specified in Rights Metadata Set</td>
<td>Identifies a POC reference including id and name</td>
</tr>
<tr>
<td>RecordsManagement</td>
<td>See DDMS 4.0.1 specification for more information.</td>
<td>0..1</td>
<td>-- see DDMS 4.0.1 specification for more information.</td>
<td></td>
</tr>
<tr>
<td>RevisionRecall</td>
<td>See DDMS 4.0.1 specification for more information.</td>
<td>0..1</td>
<td>-- see DDMS 4.0.1 specification for more information.</td>
<td></td>
</tr>
<tr>
<td>TaskingInfo</td>
<td>See DDMS 4.0.1 specification for more information.</td>
<td>0..1</td>
<td>-- see DDMS 4.0.1 specification for more information.</td>
<td></td>
</tr>
<tr>
<td>ProcessingInfo</td>
<td>See DDMS 4.0.1 specification for more information.</td>
<td>0..1</td>
<td>-- see DDMS 4.0.1 specification for more information.</td>
<td></td>
</tr>
</tbody>
</table>
4.20.3 Inclusion Criteria

The metadata components specified in Table 4-20a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.20.4 Example

Table 4-20b provides an example of a Resource Management component that can be reflected within the metacard for an M&S Resource.

Table 4-20b Resource Management Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>CCB</td>
<td><code>&lt;ms:ResourceManagement ms:type=&quot;Configuration Control Board (CCB)&quot;&gt;</code></td>
</tr>
<tr>
<td>Description</td>
<td>Included 35 approved bug fixes based on requirement changes</td>
<td><code>&lt;ms:Description&gt;</code> <a href="">ms:Text</a>Included 35 approved bug fixes based on requirement changes&lt;/ms:Text&gt; &lt;/ms:Description&gt;`</td>
</tr>
<tr>
<td>POCref</td>
<td>Person.personID = 345</td>
<td><code>&lt;ms:POCref&gt;</code> <code>&lt;ms:Person ms:personID=&quot;345&quot;&gt;</code> <code>&lt;ms:Name ms:first=&quot;John&quot; ms:last=&quot;Dillon&quot;/&gt;</code> &lt;/ms:Person&gt;`</td>
</tr>
<tr>
<td></td>
<td>Person.Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.first</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.last</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>na</td>
<td><code>&lt;ms:POCref&gt;</code> <code>&lt;ms:ConfigurationManagement&gt;</code> &lt;/ms:Usage&gt;`</td>
</tr>
</tbody>
</table>
4.21 Related Resource Metadata Set

No matter what type of M&S Resource may be cataloged, invariably there are many other assets that may be associated with the Resource. Therefore it is important to capture the essential associations pertaining to such related materials. This set was formerly called Associations. This section describes the table format identified for documenting an Association. This is illustrated in Figure 4-21.

![Figure 4-21 RelatedResource Metadata Set](image)

The Related Resource Metadata Set described in this section is a component of the Related Resources Metadata Set, which is considered a container class. There may be 1..many occurrences of RelatedResource elements for the RelatedResources container as specified in Table 4-1a.

4.21.1 Scope

Metacard Type: Resource Metacard (Core Layer)
Use Paths: Resource.RelatedResource (see Resource Metadata Set)
Required: yes (only if Resource.RelatedResources has been declared)
**Schema:** MSC-DMS-Resource

**4.21.2 Table Format**

Table 4-21a provides a description of the metadata components pertaining to the Related Resource Metadata Set information, which is leveraged by the RelatedResources component within the Resource Metadata Set. Many of the metadata components used for the RelatedResource Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to specifically support the M&S COI. Italics are used in the Values column of Table 4-21a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>resourceID</td>
<td>Unique identifier associated to the related Resource described elsewhere</td>
<td>0..1</td>
<td>URI</td>
<td>A Resource record can be marked by a unique identifier to support cross referencing by other Resources and for the benefit of organizing data by one or more repositories. This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>title</td>
<td>A name, or names, assigned to the Resource.</td>
<td>1</td>
<td>text</td>
<td>Typically, a title will be a name by which the related Resource is formally known. For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>type</td>
<td>Specifies the type of related resource.</td>
<td>1</td>
<td>software, tool, federation, software_component, service, data, data_model, interface_model_ specification, resource_document, other text</td>
<td>Recommended best practice is to select a value from a controlled vocabulary.</td>
</tr>
<tr>
<td>relationship</td>
<td>Identifies the relationship of the association with the Resource.</td>
<td>0..1</td>
<td>has-a, is-part-of, is-type-of, is-described-by, other text</td>
<td>“Has-a” is used to identify an asset that belongs to (is a part or a member of) the described Resource. In DDMs, this would be marked with a direction of “inbound” where the relationship direction is from the associated resource to the resource being described. “Is-Part-Of” is used to identify that the described Resource belongs to another asset (i.e. the Resource is a child to the associated item). In DDMs, this would be marked with a direction of “outbound” or “bidirectional” where the relationship direction is from the resource being described to the associated resource identified. “Is-Type-Of” is used to identify that the described Resource is an implementation of the associated item. In DDMs, this would be marked with either a direction of “outbound” or “bidirectional” where the relationship is bidirectional between the resource being described and the related resource identified. “Is-Described-By” is used to identify that the described Resource is documented or characterized in some way by the associated item. In DDMs, this would be marked with a direction of “outbound”.</td>
</tr>
<tr>
<td>direction</td>
<td>Identified the direction of the relationship</td>
<td>0..1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

This document is part of the DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS). For more information, please refer to the full specification document.
### 4.21.3 Inclusion Criteria

The metadata components specified in Table 4-21a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 4.21.4 Example

Table 4-21b provides an example of an Related Resource component that can be reflected within the metacard for an M&S Resource.
### Table 4-21b RelatedResource Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
</table>
| Metadata Component | Values |<ms:RelatedResource>
| resourceID | 978-0345341464 | ms:resourceID="978-0345341464" ms:title="Short Range Algorithms" ms:relationship="is-described-by" ms:type="support_asset"/>
| type | support_asset |<ms:Releasability/>
| relationship | is-described-by |<ms:Security/>
| direction | outbound |</ms:RelatedResource>
| Link | Type |<xref> locator</xref> | href | http://www.shortrangealgos.com/BMA1003.xml |<ms:Releasability/>
| Releasability | — see Table 4.23b for example | |<ms:Security/>
| Security | — see Table 4.24b for example | |</ms:RelatedResource>
4.22 Related Taxonomy Metadata Set

To increase comprehension and understanding of the metadata describing an M&S Resource, the taxonomy pertaining to a domain vocabulary source can be cited using this metadata set. This section describes the table format identified for documenting a RelatedTaxonomy. Any Related Taxonomy can be referenced by other components within an MSC-DMS based metacard. The RelatedTaxonomy.Location, contained within this metadata set, provides a means to identify the location of the taxonomy source. This is illustrated in Figure 4-22.

![Related Taxonomy Metadata Set](image)

Figure 4-22 Related Taxonomy Metadata Set

The Related Taxonomy Metadata Set described in this section is a component of the Related Taxonomy Metadata Set, which is considered a container class. There may be 1..many occurrences of RelatedTaxonomy elements for the RelatedTaxonomies container as specified in Table 4-1a.

Any taxonomy cited within the RelatedMetadata Set, which is referenced within a Metadata Set component (such as Title, Description, Usage) is intended to be used to ascertain the meaning and context of any specified word or phrase. Such word or phrases can be marked using a hashtag in the form #word, and then used to locate the word or phrase within a marked taxonomy. If a word or phrase is not found within the marked taxonomy at the element level, and not found within the parent taxonomy at the root node, then it can be presumed that the word is a common word used in the context of the Language defined within the Usage component. Typically this would be English.

4.22.1 Scope
4.22.2 Table Format

Table 4-22a provides a description of the metadata components pertaining to the Related Taxonomy Metadata Set information, which is leveraged by the RelatedTaxonomies component within the Resource Metadata Set. Italics are used in the Values column of Table 4-22a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomyID</td>
<td>The value identifier of the cited taxonomy source.</td>
<td>0..1</td>
<td>text</td>
<td>A unique id should be used to identify the taxonomy source.</td>
</tr>
<tr>
<td>value</td>
<td>A named identifier of the cited taxonomy source.</td>
<td>1</td>
<td>text</td>
<td>A name should be used to identify the taxonomy source.</td>
</tr>
<tr>
<td>version</td>
<td>A version of the taxonomy source, if known.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Location.value</td>
<td>The location address which may be used to access the information Resource content, e.g., a URI or file system location.</td>
<td>0..many</td>
<td>anyURI</td>
<td>Used in the same manner as Location pertaining to Source Metadata Set</td>
</tr>
<tr>
<td>Description</td>
<td>Open narrative used to increase comprehension pertaining to the metadata component.</td>
<td>0..1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable in the value cited in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

4.22.3 Inclusion Criteria

The metadata components specified in Table 4-22a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.22.4 Example

Table 4-22b provides an example of two RelatedTaxonomy components that can be reflected within the metacard for an M&S Resource.
## Table 4-22b Related Taxonomy Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Values</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomyID</td>
<td>tax0001_1_3</td>
<td><a href="">ms:RelatedTaxonomies</a></td>
</tr>
<tr>
<td>value</td>
<td>logistics_support</td>
<td></td>
</tr>
<tr>
<td>version</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Location.value</td>
<td>http://www.logistics_r_us.com</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Taxonomy identifies all the key terms for support logistics on the battlefield</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>taxonomyID</td>
<td>MD_tax_1_1</td>
<td><a href="">ms:RelatedTaxonomy</a></td>
</tr>
<tr>
<td>value</td>
<td>Missile_Defense</td>
<td></td>
</tr>
<tr>
<td>version</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Location.value</td>
<td><a href="http://www.star-wars.com">http://www.star-wars.com</a></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Taxonomy identifies all the key terms for missile defense</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;/ms:RelatedTaxonomy&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;/ms:RelatedTaxonomies&gt;</td>
</tr>
</tbody>
</table>
4.23 Releasability Metadata Set

The releasability of a Resource is often restricted in some way, therefore it is important to reflect the releasability information pertaining to an M&S Resource. This section describes the Resource Metadata Set for documenting a resource’s Releasability coverage as illustrated in Figure 4-23.

![Figure 4-23 Releasability Metadata Set](image)

4.23.1 Scope

**Metacard Type:** Resource Metacard (Core Layer)

**Use Path(s):**
- Resource.Releasability *(see Resource Metadata Set)*
- Resource.MetacardInfo.Releasability *(see Metacard Info Metadata Set)*
- Resource.Title.Releasability *(see Title Metadata Set)*
- Resource.Description.Releasability *(see Description Metadata Set)*
- Resource.POCs.POC.Releasability *(see POC Metadata Set)*
- Resource.Usages.Usage.Releasability *(see Usage Metadata Set)*
- Resource.Source.Releasability *(see Source Metadata Set)*
- Resource.Extensions.VirtualCoverage.Releasability *(see Virtual Coverage Metadata Set)*
- Resource.Extensions.GeoSpatialCoverage.Releasability *(see Geospatial Coverage Metadata Set)*
- Resource.Extensions.HLACoverage.Releasability *(see HLA Coverage Metadata Set)*
- Resource.Extensions.VVACoverage.Releasability *(see VVA Coverage Metadata Set)*

**Required:** yes *(only for Resource, optional for all others)*

**Schema:** MSC-DMS-Resource

4.23.2 Table Format

Table 4-23a provides a description of the metadata components pertaining to Releasability, which is leveraged by a Resource’s root node, Title, Description, RelatedResources.Association, POCs.POC,
Usages, Usage, and Source components within the Resource Metadata Set. Italics are used in the Values column of Table 4-23a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values (i.e., enumerations).

### Table 4-23a Releasability Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
</table>
| value              | A value assigned to the releasability of the Resource. | 1      | A: Unlimited distribution  
B: U.S. Govt. agencies only  
C: U.S. Govt. agencies and contractors only  
D: DoD and DoD contractors only  
E: DoD components only  
F: As directed by DoD originator  
X: Those eligible to obtain export-controlled technical data  
other text |         |
| other              | Specifies other information deemed relevant by the author of the Resource. | 0..many | any |         |

### 4.23.3 Inclusion Criteria

The metadata components specified in Table 4-15 are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 4.23.4 Example

Table 4-23b provides an example of a Releasability component that can be reflected within the metacard for an M&S Resource.

### Table 4-23b Releasability Coverage Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>value</td>
<td>A: Unlimited distribution</td>
</tr>
<tr>
<td>other</td>
<td>na</td>
</tr>
</tbody>
</table>
4.24 Security Metadata Set

Resources often are restricted in some way; therefore it is important to reflect the security information pertaining to an M&S Resource. This section describes the Security Metadata Set for documenting Security as illustrated in Figure 4-24.

Figure 4-24 reflects three different security types. They vary based on what information is being marked. Security is marked different at the top level compared to the sub levels. And at the sub levels, some elements require security information to be present, whereas other elements make the security information optional. Section 4.24.1 identifies where which of the three Security Metadata Set should be applied.
4.24.1 Scope

**Metacard Type:** Resource Metacard (Core Layer)

**Top Level**

**Use Path(s):** Resource.Security (see Resource Metadata Set)

**Sub Level – Required**

**Use Path(s):**
- Resource.MetacardInfo.Security (see Metacard Info Metadata Set)
- Resource.Title.Security (see Title Metadata Set)
- Resource.Description.Security (see Description Metadata Set)

**Sub Level – Optional**

**Use Path(s):**
- Resource.POCs.POC.Security (see POC Metadata Set)
- Resource.Source.Security (see Source Metadata Set)
- Resource.Extensions.HLACoverage.Security (see HLA Coverage Metadata Set)
- Resource.Extensions.VVACoverage.Security (see VVA Coverage Metadata Set)

**Required:** varies depending on the element of focus

**Schema:** MSC-DMS-Resource

4.24.2 Table Format

Table 4-24a provides a description of the metadata components pertaining to Security coverage. The metadata components used for the Security Metadata Set are leveraged from the IC-IMS’s Security Attribute Group. Italics are used in the Values column of Table 4-24a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values (i.e., enumerations).
Table 4-24a Security Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>excludeFromRollup</td>
<td>An attribute of security that specifies whether the security markings are</td>
<td>1</td>
<td>Must be set to &quot;true&quot;.</td>
<td>ONLY APPLICABLE FOR TOPELEVEL ROOT</td>
</tr>
<tr>
<td></td>
<td>excluded from rollup procedures for security markings on parent nodes.</td>
<td></td>
<td></td>
<td>This is an attribute from the IC ISM markings. Since the security</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>markings are the markings on the data asset described by the DDMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>metadata card, they have no bearing on the security releasability of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>the DDMS record itself and therefore, by definition, are</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>excluded from rollup procedural requirements on the Resource Heading</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>security markings.</td>
</tr>
<tr>
<td>classification</td>
<td>A simple type in which a name token is restricted to the US, non-US, and joint</td>
<td>1 *</td>
<td>U.C, S, TS, R,</td>
<td>* REQUIRED only for the following elements:</td>
</tr>
<tr>
<td></td>
<td>classification portion mark abbreviations from the CAPCO Register.</td>
<td></td>
<td>CTS, CTS-B, CTS-BALK,</td>
<td>• toplevel root,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NU, NR, NC, NS, NS-S, NS-A,</td>
<td>• Title, &amp;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CTSA, NSAT, NCA</td>
<td>• Description</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If an asset is &quot;FOUO&quot; the 'classification' must be &quot;U&quot;. See also</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>'disseminationControls'.</td>
</tr>
<tr>
<td>ownerProducer</td>
<td>ISO 3166-1 trigraph(s) of the owner or producer country(ies) and/or CAPCO-</td>
<td>1 *</td>
<td>text</td>
<td>* REQUIRED only for describing</td>
</tr>
<tr>
<td></td>
<td>specified tetragraphs of international organizations. Either (a) a single</td>
<td></td>
<td></td>
<td>security for the following elements:</td>
</tr>
<tr>
<td></td>
<td>trigraph or tetragraph or (b) a space-delimited list of trigraphs followed</td>
<td></td>
<td></td>
<td>• toplevel root,</td>
</tr>
<tr>
<td></td>
<td>by tetragraphs. Trigraphs must be in alphabetical order and tetragraphs</td>
<td></td>
<td></td>
<td>• Title, &amp;</td>
</tr>
<tr>
<td></td>
<td>must be in alphabetical order.</td>
<td></td>
<td></td>
<td>• Description</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCI Controls</td>
<td>Authorized abbreviation(s) of SCI control system(s). Either (a) a single</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td></td>
<td>abbreviation or (b) a space-delimited list of abbreviations in the order</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>prescribed in the CAPCO Register.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARIdentifier</td>
<td>Authorized Special Access Required program digraph(s) or trigraph(s)</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td></td>
<td>preceded by &quot;SAR-&quot;. Either (a) a single digraph or trigraph or (b) a space-</td>
<td></td>
<td>Example: “SAR-ABC SAR-DEF ...”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>delimited list of digraphs or trigraphs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>atomicEnergyMarkings</td>
<td>This attribute is used at both the resource and the portion levels. One or</td>
<td>0..1</td>
<td>text</td>
<td>The permissible values for this simple type are defined in the</td>
</tr>
<tr>
<td></td>
<td>more indicators identifying DoE markings. It is manifested in portion marks</td>
<td></td>
<td></td>
<td>Controlled Value Enumeration:</td>
</tr>
<tr>
<td></td>
<td>and security banners.</td>
<td></td>
<td></td>
<td>CVEnumISMAAtomicEnergyMarkings.xml</td>
</tr>
<tr>
<td>disseminationControls</td>
<td>Authorized dissemination control portion mark abbreviation(s). Either (a) a</td>
<td>0..1</td>
<td>text</td>
<td>To add FOUO to the DDMS or MSC-DMS, mark the</td>
</tr>
<tr>
<td></td>
<td>single abbreviation or (b) a space-delimited list of abbreviations in the</td>
<td></td>
<td></td>
<td>&quot;disseminationControls&quot; attribute with the value &quot;FOUO&quot;, whereas the</td>
</tr>
<tr>
<td></td>
<td>order shown in the CAPCO Register. Exception: For the &quot;REL&quot; abbreviation,</td>
<td></td>
<td></td>
<td>'classification' must be &quot;U&quot; for unclassified.</td>
</tr>
<tr>
<td></td>
<td>omit the country code trigraph(s) and instead place the trigraph(s) in the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;releasableTo&quot; attribute value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>displayOnlyTo</td>
<td>This attribute is used at both the resource and the portion levels. One or</td>
<td>0..1</td>
<td>text</td>
<td>The permissible values for this attribute are defined in the Controlled</td>
</tr>
<tr>
<td></td>
<td>more indicators identifying the country or countries and/or international</td>
<td></td>
<td></td>
<td>Value Enumeration: CVEnumISMDisplayOnlyTo.xml</td>
</tr>
<tr>
<td></td>
<td>organization(s) to which classified information may be displayed but NOT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>released based on the determination of an originator in accordance with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>established foreign disclosure procedures. This element is used in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>conjunction with the DisplayOnly Dissemination Controls value. It is</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>manifested in portion marks and security banners.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGIsourceOpen</td>
<td>Non-US classification portion marking for foreign government information in a document portion. Use this attribute to record a source country when the intent is to post the document to a shared space with the source identified.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>FGIsourceProtected</td>
<td>Non-US classification portion marking for foreign government information in a document portion. Use this attribute to record a source country when the intent is to filter out the identity of the source prior to posting the document to a shared space.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>releasableTo</td>
<td>ISO 3166-1 trigraphic codes of countries to which the associated content can be released. Include “USA” in all instances. Use a space-delimited list with “USA” first, followed by the other trigraph(s) in alphabetical order.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>nonICmarkings</td>
<td>Authorized non-IC portion marking abbreviation(s) from the CAPCO Register. Either (a) a single non-IC abbreviated marking or (b) a space-delimited list of abbreviations in the order shown in the CAPCO Register.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>classifiedBy</td>
<td>This attribute is used primarily at the resource level. The identity, by name or personal identifier, and position title of the original classification authority for a resource. It is manifested only in the 'Classified By' line of a resource's classification authority block.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>compilationReason</td>
<td>A description of the reasons that the classification of this element is more restrictive than a simple roll-up of the sub elements would result in. This acts as an indicator to rule engines that there is not accidental over classification going on and to users that special care beyond what the portion marks reveal must be taken when using this data. Use of this mark does not replace the need for the compilation reason being defined in the prose in accordance with ISOO Directive 1.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>derivativelyClassifedBy</td>
<td>Used primarily at the Resource level to specify the identity, by name or personal identifier, and position title of the derivative classifier for a Resource. It is manifested only in the 'Classified By' line of a Resource's Classification/Declassification block.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>classificationReason</td>
<td>A text string containing one or more paragraph numbers, 1.4(a) through 1.4(h), taken from E.O. 12958, as amended. Enter the paragraph references as they should appear in a classification / declassification block.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>nonUSControls</td>
<td>This attribute is used at both the resource and the portion levels. One or more indicators of the expansion or limitation on the distribution of an information resource or portion within the domain of information originating from non-US components. It is manifested in portion marks and security banners.</td>
<td>0..1 text</td>
</tr>
<tr>
<td>derivedFrom</td>
<td>A text string containing (a) the title and date of a specific source document, or (b) the title and date of an organization classification guide, or (c) the literal string &quot;Multiple Sources.&quot;</td>
<td>0..1 text</td>
</tr>
<tr>
<td>declassDate</td>
<td>A specific date, in the format YYYY-MM-DD, at which the applicable information is automatically declassified.</td>
<td>0..1 date</td>
</tr>
<tr>
<td>declassEvent</td>
<td>A textual description of an event that triggers declassification.</td>
<td>0..1 text</td>
</tr>
</tbody>
</table>
4.24.3 Inclusion Criteria

The metadata components specified in Table 4-24a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

4.24.4 Example

Table 4-24a provides an example of a Security component that can be reflected within the metacard for an M&S Resource. Note: the example is not intended to reflect an actual example of a security element. It is merely an example of how each individual attribute could be filled in. The ISM documentation referenced by this document and the DDMS should also be evaluated to gain additional guidance in how to security attributes.

Table 4-18 Security Metadata Examples

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Information</td>
</tr>
<tr>
<td>excludeFromRollup</td>
<td>true</td>
</tr>
<tr>
<td>classification</td>
<td>U</td>
</tr>
<tr>
<td>ownerProducer</td>
<td>USA</td>
</tr>
<tr>
<td>SCI Controls</td>
<td>ST</td>
</tr>
<tr>
<td>SARIdentifier</td>
<td>SAR-ABC SAR-DEF</td>
</tr>
<tr>
<td>atomicEnergyMarkings</td>
<td>FRD</td>
</tr>
</tbody>
</table>

<ms:Security
  icism:classification="U"
  icism:ownerProducer="USA"
  icism:SCIcontrols="ST"
  icism:SARIdentifier="SAR-ABC SAR-DEF"
  icism:disseminationControls="FOUO"
<table>
<thead>
<tr>
<th>disseminationControls</th>
<th>FOUO</th>
</tr>
</thead>
<tbody>
<tr>
<td>displayOnlyTo</td>
<td>USA</td>
</tr>
<tr>
<td>FGIsourceOpen</td>
<td>AUS NZL NATO</td>
</tr>
<tr>
<td>FGIsourceProtected</td>
<td>USA AUS</td>
</tr>
<tr>
<td>releasableTo</td>
<td>USA</td>
</tr>
<tr>
<td>nonICmarkings</td>
<td>NMTOKEN</td>
</tr>
<tr>
<td>classifiedBy</td>
<td>John Doe, FSO</td>
</tr>
<tr>
<td>compilationReason</td>
<td>This is super secret</td>
</tr>
<tr>
<td>derivativelyClassifiedBy</td>
<td></td>
</tr>
<tr>
<td>classificationReason</td>
<td>1.4(b)</td>
</tr>
<tr>
<td>nonUSControls</td>
<td>BOHEMIA</td>
</tr>
<tr>
<td>derivedFrom</td>
<td>fundamentaldocument.doc</td>
</tr>
<tr>
<td>declassDate</td>
<td>2010-01-01</td>
</tr>
<tr>
<td>declassEvent</td>
<td></td>
</tr>
<tr>
<td>declassException</td>
<td>NONE</td>
</tr>
<tr>
<td>noticeList</td>
<td></td>
</tr>
<tr>
<td>Notice</td>
<td></td>
</tr>
<tr>
<td>NoticeText</td>
<td>Text for notice</td>
</tr>
<tr>
<td>Access</td>
<td></td>
</tr>
<tr>
<td>AccessIndividualList</td>
<td></td>
</tr>
<tr>
<td>AccessIndividual</td>
<td></td>
</tr>
<tr>
<td>AccessIndividualValue</td>
<td>Jane Doe</td>
</tr>
</tbody>
</table>

icism:FGIsourceOpen="AUS NZL NATO"
cism:FGIsorceProtected="AUS USA"
cism:releasableTo="USA"
cism:nonICmarkings="NMTOKEN"
cism:classifiedBy="John Doe, FSO"
cism:derivativelyClassifiedBy=""
cism:classificationReason="1.4(b)"
cism:derivedFrom="fundamentaldocument.doc"
cism:declassDate="2010-01-01"
cism:declassEvent=""
cism:declassException="NONE"
cism:typeOfExemptedSource="AUS"
cism:dateOfExemptedSource="1997-08-13"
cism:declassManualReview="false"/>
5 Contact Metacards

A person or an organization can also be a valuable asset to help others achieve related goals such as reusing and/or integrating an M&S Resource. For instance, when federation developers wish to pose detailed questions to those who were responsible for the development and distribution of a model, point-of-contact (POC) information can be vital.

The MSC-DMS provides a means to capture and share Contacts information independent from a Resource Metacard. Figure 5-1 provides an illustration of the MSC-DMS Contact Structure. The boxes with a solid outline represent required metadata components, whereas the boxes with a dashed outline represent optional metadata components.

![Contact Metacard Structure](image)

Figure 5-1 Contact Metacard Structure

This section describes the following metadata sets:

- Contact (root)
- Person
- Organization
5.1 Contact Metadata Set

There may be many individuals or organizations responsible for the development, management, or use of an M&S asset. Therefore, it is important to capture the essential components pertaining to individuals and organizations that are knowledgeable about an M&S asset. This section describes the table formats identified for capturing details about a Contact. There are other subcomponents used by the Contact Metadata Set, which are also presented in Section 5. The Contact Metadata Set is illustrated in Figure 5-1.

![Figure 5-1 Contact Metadata Set](image)

5.1.1 Scope

**Metacard Type:** Contact Metacard  
**Use Path(s):** none *(this is the root component for a Contact Metacard)*  
Multicard.Metacards.Contacts *(see Multicard Metadata Set)*  
**Required:** yes *(if you are building a Contact Metacard, but not required for a Multicard)*  
**Schema:** MSC-DMS-Contact

5.1.2 Table Format

Table 5-1a provides a description of the metadata components pertaining to the Contact Metadata Set information, which is also leveraged by the POCs component within the Resource Metadata Set. The difference between Contact Metadata Set and POC Metadata Set is that the POC Metadata Set...
allows a role to be identified, whereas Contact Metadata Set does not. Many of the metadata components used for the Contact Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 5-1a to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

Table 5-1a Contact Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Metadata Component Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person</td>
<td>Specifies person.</td>
<td>0..1</td>
<td>--</td>
<td>see Person Metadata Set</td>
</tr>
<tr>
<td>Organization</td>
<td>Specifies organization.</td>
<td>0..1</td>
<td>--</td>
<td>see Organization Metadata Set</td>
</tr>
<tr>
<td>Service</td>
<td>Specifies service.</td>
<td>0..1</td>
<td>--</td>
<td>see Organization Metadata Set</td>
</tr>
<tr>
<td>Description.value</td>
<td>This field provides an account of the POC.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the Contact Metacard.</td>
<td>0..1</td>
<td>--</td>
<td>see Releasability Metadata Set</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Contact Metacard.</td>
<td>0..1</td>
<td>--</td>
<td>see Security Metadata Set (Sublevel – Optional)</td>
</tr>
<tr>
<td>Image</td>
<td>Allows an image to be identified with the Contact Metacard.</td>
<td>0..1</td>
<td>--</td>
<td>see Image Metadata Set</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Contact Metacard.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

5.1.3 Inclusion Criteria

The metadata components specified in Table 5-1a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

5.1.4 Example

Table 5-1b provides an example of a Contact component that can be reflected within a Contact Metacard.

Table 5-1b Contact Metadata Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Values</td>
</tr>
<tr>
<td>Person</td>
<td>— see Section 5.2 for example</td>
</tr>
<tr>
<td>Organization</td>
<td>— see Section 5.3 for example</td>
</tr>
<tr>
<td>Description</td>
<td>The chief architect of the model</td>
</tr>
<tr>
<td>Releasability</td>
<td>— see Section 4.8 for example</td>
</tr>
<tr>
<td>Security</td>
<td>— see Section 4.9 for example</td>
</tr>
<tr>
<td>Image</td>
<td>— see Section 4.15 for example</td>
</tr>
</tbody>
</table>
5.2 Person Metadata Set

There may be an individual responsible for the development, management, or use of an M&S asset. Therefore, it is important to capture the essential metadata information pertaining an individual that may be knowledgeable about an M&S asset. This section describes the table format identified for documenting a Person. The Person Metadata Set is illustrated in Figure 5-2.

![Figure 5-2 Person Metadata Set](image-url)
5.2.1 Scope

Metacard Type: Contact Metacard
Use Path(s): Contact.Person
Resource.POCs.POC.Person
Required: choice (if not provided than an Organization is required)
Schema: MSC-DMS-Contact

5.2.2 Table Format

Table 5-2a provides a description of the metadata components pertaining to the Person Metadata Set, which is leveraged by both the Resource.POCs.POC component within the Resource Metadata Set (see section 4.11), and also by the Contact component within the Contact Metadata Set component (see section 5.1). Many of the metadata components used for the Person Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 5-3 to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>personID</td>
<td>Unique identifier associated to an author, coauthor, POC, tasking requester or addressee.</td>
<td>0..1</td>
<td>URI</td>
<td>A person record can be marked by a unique identifier to support cross referencing by other contact records and for the benefit of organizing data by one or more repositories.</td>
</tr>
<tr>
<td>sponsorID</td>
<td>Unique identifier associated to a sponsor of the contact.</td>
<td>0..1</td>
<td>URI</td>
<td></td>
</tr>
<tr>
<td>supervisorID</td>
<td>Specifies the unique identifier associated to a supervisor if applicable.</td>
<td>0..1</td>
<td>URI</td>
<td>Search Person records to cross reference supervisor Id and learn about supervisor.</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the person.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>title</td>
<td>Title given to a person</td>
<td>0..1</td>
<td>Dr., Miss, Mr., Mrs., Ms., Prof., other text</td>
<td></td>
</tr>
<tr>
<td>first</td>
<td>First name given to a person at birth or baptism.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>middle</td>
<td>Middle name given to a person at birth or baptism, in addition to first name.</td>
<td>0..1</td>
<td>text</td>
<td>Helps differentiate common names.</td>
</tr>
<tr>
<td>last</td>
<td>A name shared in common to identify members of a family; also called “surname.”</td>
<td>1</td>
<td>text</td>
<td>This value must contain a complete name, and cannot be an initial.</td>
</tr>
<tr>
<td>suffix</td>
<td>Suffix given to a person.</td>
<td>0..1</td>
<td>I, II, III, Jr., Sr., other text</td>
<td></td>
</tr>
<tr>
<td>Affiliation</td>
<td>Identifies the organization affiliated with the person.</td>
<td>0..many</td>
<td></td>
<td></td>
</tr>
<tr>
<td>organizationID</td>
<td>References the organization ID.</td>
<td>0..1</td>
<td>URI</td>
<td>Can be used to correlate with Organization that has been identified.</td>
</tr>
<tr>
<td>position</td>
<td>Position held by the person.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>value</td>
<td>Identifies the name of the organization.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>JobTitle.value</td>
<td>Identifies job title</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
</tbody>
</table>
5.2.3 Inclusion Criteria

The metadata components specified in Table 5-2a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

5.2.4 Example

Table 5-2b provides an example of a Person component that can be reflected within the metacard for an M&S Contact (or as part of a POC component of an M&S Resource metacard).
### Table 5-2b Person Metadata Example

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>personID</td>
<td>231</td>
<td><code>&lt;ms:Contact&gt;</code></td>
</tr>
<tr>
<td>sponsored</td>
<td>332</td>
<td></td>
</tr>
<tr>
<td>supervisorID</td>
<td>230</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>first</td>
<td>John</td>
<td></td>
</tr>
<tr>
<td>middle</td>
<td>Michael</td>
<td></td>
</tr>
<tr>
<td>last</td>
<td>Davidson</td>
<td></td>
</tr>
<tr>
<td>Affiliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>organization ID</td>
<td>331</td>
<td></td>
</tr>
<tr>
<td>position</td>
<td>Developer</td>
<td></td>
</tr>
<tr>
<td>value</td>
<td>Sprocket Sim</td>
<td></td>
</tr>
<tr>
<td>Job Title.value</td>
<td>System Engineer</td>
<td></td>
</tr>
<tr>
<td>Address Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address Line 1.value</td>
<td>123 Jetway Drive</td>
<td></td>
</tr>
<tr>
<td>Address Line 2.value</td>
<td>Suite</td>
<td></td>
</tr>
<tr>
<td>Address Line 3.value</td>
<td>ATTN: John Davidson</td>
<td></td>
</tr>
<tr>
<td>City.value</td>
<td>Alexandria</td>
<td></td>
</tr>
<tr>
<td>State.value</td>
<td>Virginia</td>
<td></td>
</tr>
<tr>
<td>Country.value</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>Postal Code.value</td>
<td>22308</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Work</td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>703-360-3767</td>
<td></td>
</tr>
<tr>
<td>extension</td>
<td>351</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Work</td>
<td></td>
</tr>
<tr>
<td>address</td>
<td><a href="mailto:jdavidson@sprocketsim.com">jdavidson@sprocketsim.com</a></td>
<td></td>
</tr>
<tr>
<td>Web Address.value</td>
<td><a href="http://www.sprocketsim.com">http://www.sprocketsim.com</a></td>
<td></td>
</tr>
<tr>
<td>ContactInstruction.value</td>
<td>Leave message at help desk if no answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
5.3 Organization Metadata Set

There may be an organization responsible for the development, management, or use of an M&S asset. Therefore, it is important to capture the essential metadata information pertaining to an organization that may be knowledgeable about an M&S asset. This section describes the table format identified for documenting an Organization. The Organization Metadata Set is illustrated in Figure 5-3.

5.3.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Contact Metacard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>Contact.Organization</td>
</tr>
<tr>
<td></td>
<td>Resource.POCs.POC.Organization</td>
</tr>
</tbody>
</table>
5.3.2 Table Format

Table 5-3a provides a description of the metadata components pertaining to the Organization Metadata Set, which is leveraged by the Resource.POCs.POC component within the Resource Metadata Set (see section 4.11), and also by the Contact component within the Contact Metadata Set component (see section 5.1). Many of the metadata components used for the Organization Metadata Set are leveraged from the DDMS; however there are some additional metadata components that were added to better support the M&S COI. Italics are used in the Values column of Table 5-3 to denote the type of data that is provided (e.g., text). Normal font is used in this column to denote potential literal values.

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>organizationID</td>
<td>Unique identifier associated to an Organization.</td>
<td>0..1</td>
<td>URI</td>
<td>An organization record can be marked by a unique identifier to support cross referencing by other contact records and for the benefit of organizing data by one or more repositories.</td>
</tr>
<tr>
<td>sponsorID</td>
<td>Unique identifier associated to a sponsor (person or organization) if applicable.</td>
<td>0..1</td>
<td>URI</td>
<td>Search Organization records to cross reference supervisor Id and learn about sponsor.</td>
</tr>
<tr>
<td>parentID</td>
<td>Specifies the unique identifier associated to a parent organization if applicable.</td>
<td>0..1</td>
<td>URI</td>
<td>Search Organization records to cross reference Parent Id and learn about parent organization.</td>
</tr>
<tr>
<td>Name.value</td>
<td>Specifies organization name.</td>
<td>1</td>
<td>text</td>
<td>Examples might include Defense Contractor, Government, and Academia.</td>
</tr>
<tr>
<td>Type</td>
<td>Specifies organization type</td>
<td>1</td>
<td>government, academia, industry, other text</td>
<td></td>
</tr>
<tr>
<td>Address Info</td>
<td>Specifies Address associated to Organization.</td>
<td>0..many</td>
<td></td>
<td>The first line in the address where the Organization may be contacted. This will typically be used for a street number and name.</td>
</tr>
<tr>
<td>AddressLine1.value</td>
<td>Main Address of the Organization.</td>
<td>0..1</td>
<td>text</td>
<td>The second line in the address where the Organization may be contacted. This will typically be used for amplifying information such as a suite number or mail stop.</td>
</tr>
<tr>
<td>AddressLine2.value</td>
<td>Supplemental Address such as suite.</td>
<td>0..1</td>
<td>text</td>
<td>The third line in the address where the Organization may be contacted. This will typically be used for additional amplifying information such as “attention” instructions.</td>
</tr>
<tr>
<td>AddressLine3.value</td>
<td>Supplemental Address such as POC.</td>
<td>0..1</td>
<td>text</td>
<td>The country code of the address where the Organization may be contacted. For US addresses, this will be a ZIP code.</td>
</tr>
<tr>
<td>City.value</td>
<td>Specifies city associated to Organization’s Address.</td>
<td>0..1</td>
<td>text</td>
<td>The city of the address where the Organization may be contacted.</td>
</tr>
<tr>
<td>State.value</td>
<td>Specifies state associated to Organization’s Address.</td>
<td>0..1</td>
<td>text</td>
<td>The state, province, or comparable boundary of the address where the Organization may be contacted.</td>
</tr>
<tr>
<td>Country.value</td>
<td>Specifies country associated to Organization’s Address.</td>
<td>0..1</td>
<td>text</td>
<td>The country code of the address where the Organization may be contacted.</td>
</tr>
<tr>
<td>PostalCode.value</td>
<td>Specifies postal code associated to Organization’s Address.</td>
<td>0..1</td>
<td>text</td>
<td>The postal code of the address where the Organization may be contacted. For US addresses, this will be a ZIP code.</td>
</tr>
<tr>
<td>Phone</td>
<td>Specifies the telephone number for the organization including the international telephone code for the Organization’s country, and fax.</td>
<td>0..many</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metadata Component</td>
<td>Information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Specifies the phone type.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>Specifies the specific number associated with the phone type.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>extension</td>
<td>Specifies an extension to the phone number.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Specifies the email address(es) of the Organization for electronic mail.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Specifies the email type.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>address</td>
<td>Specifies the email address.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WebAddress.value</td>
<td>Specifies the web address(es) associated with the Organization.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ContactInstruction.value</td>
<td>Specifies instructions for making contact.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other information deemed relevant by the author of the Resource.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 5.3.3 Inclusion Criteria

The metadata components specified in Table 5-5 are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 5.3.4 Example

Table 5-3b provides an example of an Organization component that can be reflected within the metacard for an M&S Contact (or as part of a POC component of an M&S Resource metacard).

**Table 5-3b Organization Metadata Example**

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>OrganizationID</td>
<td>256</td>
</tr>
<tr>
<td>parent ID</td>
<td>255</td>
</tr>
<tr>
<td>Name</td>
<td>SprocketSim, Inc</td>
</tr>
<tr>
<td>Type</td>
<td>Industry</td>
</tr>
<tr>
<td>Address Info</td>
<td></td>
</tr>
<tr>
<td>Address Line 1</td>
<td>123 Jetway Drive</td>
</tr>
<tr>
<td>Address Line 2</td>
<td>Suite 5</td>
</tr>
<tr>
<td>Address Line 3</td>
<td>ATTN: John Davidson</td>
</tr>
<tr>
<td>City</td>
<td>Alexandria</td>
</tr>
<tr>
<td>State</td>
<td>Virginia</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td>Postal Code</td>
<td>22308</td>
</tr>
<tr>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>phone</td>
</tr>
<tr>
<td>Number</td>
<td>703-360-3767</td>
</tr>
<tr>
<td>Email</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>email</td>
</tr>
<tr>
<td>address</td>
<td><a href="mailto:jdavidson@sprocketsim.com">jdavidson@sprocketsim.com</a></td>
</tr>
</tbody>
</table>

### XML Format

```xml
<ms:Contact>
  <ms:Organization
    ms:organizationID="256"
    ms:parentID="255">
    <ms:Name ms:value="SprocketSim, Inc"/>
    <ms:Type ms:value="industry"/>
    <ms:AddressInfo>
      <ms:AddressLine1 ms:value="123 Jetway Dr."/>
      <ms:AddressLine2 ms:value="Suite 5"/>
      <ms:AddressLine3 ms:value="ATTN: John Davidson"/>
      <ms:City ms:value="Alexandria"/>
      <ms:State ms:value="Virginia"/>
      <ms:Country ms:value="USA"/>
      <ms:PostalCode ms:value="22308"/>
    </ms:AddressInfo>
    <ms:Phone
      ms:type="work"
      ms:number="703-360-3767">
      <ms:Email
        ms:type="work"
        ms:value="jdavidson@sprocketsim.com"/>
    </ms:Phone>
  </ms:Organization>
</ms:Contact>
```
<table>
<thead>
<tr>
<th>URL</th>
<th><a href="http://www.sprocketsim.com">http://www.sprocketsim.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Instruction</td>
<td>contact John Davidson</td>
</tr>
<tr>
<td>Contact Instruction</td>
<td>For general assistance, dial 0 for an operator.</td>
</tr>
</tbody>
</table>

<ms:Organization>
<ms:Description>
<ms:Text>"Lead system integrator"</ms:Text>
</ms:Description>
<ms:Releasability/>
<ms:Security/>
</ms:Contact>
6 Taxonomy Metacards

The text used to describe most assets corresponds to a specific taxonomy of terms and definitions. It is important to have a mechanism that can identify such terms and definitions. The MSC-DMS provides a means to capture Taxonomies in a way that allows the discovery metadata relevant to a resource to be understood more richly. Figure 6-1 provides an illustration of the MSC-DMS Taxonomy Metacard structure. The boxes with a solid outline represent required metadata components, whereas the boxes with a dashed outline represent optional metadata components.

![Figure 6-1 Taxonomy Metacard Structure](image)

This section describes the following metadata sets:

- Taxonomy (root)
- Definition Specification
6.1 Taxonomy Metadata Set

The purpose of the Taxonomy Metadata Set is to document certain key metadata information about an M&S Taxonomy that is applicable to a community or domain area. The Taxonomy Metadata Set identifies the foundational metadata components of M&S Taxonomy at the root level. The Taxonomy Metadata Set illustrated in Figure 6-1.

Figure 6-1 Taxonomy Metadata Set
6.1.1 Scope

**Metacard Type:** Taxonomy Metacard

**Use Paths:** none (this is the root component for a Taxonomy metacard)

**Multicard.Metacards.Taxonomies** (see Multicard Metadata Set)

**Required:** yes (if you are building a Taxonomy metacard, but not required for a Multicard)

**Schema:** MSC-DMS-Taxonomy

6.1.2 Table Format

Table 6-1a provides a description of the metadata components pertaining to the Taxonomy Metadata Set. Many of the metadata components used for the Taxonomy Metadata Set are leveraged from a DoD community specification identified as the “Thesaurus Approach for the Federal Government”, This work includes an XML schema that has provided the basis for the Taxonomy Metadata Set and the Term Metadata Set; however there are some additional metadata components that were extended, altered or added to better support the M&S COI. Italics are used in the Values column of Table 6-1a to denote the type of data to be provided (e.g., text). Normal font is used in this column to denote potential literal values.

**Table 6-1a Taxonomy Metadata Set**

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxonomyID</td>
<td>Unique identifier associated to the related Taxonomy Classification being defined</td>
<td>0..1</td>
<td>URI</td>
<td>A Taxonomy record can be marked by a unique identifier to support cross referencing by other metacards (i.e. Resource Metacards) and for the benefit of organizing data by one or more repositories. This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>Title</td>
<td>Text identifier for the Taxonomy</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description.Value</td>
<td>Open narrative used to increase comprehension pertaining to the taxonomy.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Dates</td>
<td>Identifies date information related to the Taxonomy Classification asset.</td>
<td>0..1</td>
<td>-- see Date Metadata Set</td>
<td></td>
</tr>
<tr>
<td>Version</td>
<td>This field specifies the version identification assigned to the Taxonomy metacard</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Container for each term that is to be named and defined.</td>
<td>1.many</td>
<td></td>
<td>Section 4.8</td>
</tr>
<tr>
<td>Name</td>
<td>Identifies the name of the term.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Acronym</td>
<td>Specifies an acronym associated with term</td>
<td>0..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>ExpandedAcronym</td>
<td>Expands the acronym fully.</td>
<td>0..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>DefinitionSection</td>
<td>Specifies other date information deemed relevant by the author of the Resource</td>
<td>0..many</td>
<td>-- see Definition Metadata Set</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other extension information deemed relevant by the author of the Taxonomy Term</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the Taxonomy Metacard.</td>
<td>0..1</td>
<td>-- see Releasability Metadata Set</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Taxonomy Metacard.</td>
<td>0..1</td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other data deemed relevant by the author of the Taxonomy.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

Version 1.5 July 12, 2012
6.1.3 Inclusion Criteria

The metadata components specified in Table 6-1 are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

6.1.4 Example

Table 6-1b provides an example of the taxonomy component that can be reflected within the metacard for an M&S Taxonomy.

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metadata Component</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>taxonomyID</td>
<td>4</td>
</tr>
<tr>
<td>version</td>
<td>0.1</td>
</tr>
<tr>
<td>Title</td>
<td>MS Glossary</td>
</tr>
<tr>
<td>Description</td>
<td>This is an example of a taxonomy classification documenting key terms and definitions for the MS Community</td>
</tr>
<tr>
<td>Dates.Date</td>
<td>-- see Date Metadata Set</td>
</tr>
<tr>
<td>Term</td>
<td>-- see Definition Metadata Set</td>
</tr>
<tr>
<td>Name</td>
<td>ontology</td>
</tr>
<tr>
<td>Acronym</td>
<td>na</td>
</tr>
<tr>
<td>ExpandedAcronym</td>
<td>na</td>
</tr>
<tr>
<td>DefinitionSection</td>
<td>-- see Definition Metadata Set</td>
</tr>
<tr>
<td>Releasability</td>
<td>--see Section 4.23 for example</td>
</tr>
<tr>
<td>Security</td>
<td>--see Section 4.24 for example</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.2 Definition Metadata Set

The purpose of the Definition Metadata Set is to document certain key metadata information about an M&S Taxonomy Terms that is applicable to a community or domain area. The Definition Metadata Set illustrated in Figure 6.2.

![Definition Metadata Set Diagram](image)

**Figure 6-2 Definition Metadata Set**

6.2.1 Scope

- **Metacard Type:** Taxonomy Metacard
- **Use Path(s):** Taxonomy.Term.DefinitionSection *(see Taxonomy Metadata Set)*
- **Required:** yes
- **Schema:** MSC-DMS-Taxonomy

6.2.2 Table Format

Table 6-2a provides a description of the metadata components pertaining to the Definition Metadata Set information. Many of the metadata components used for the Definition Metadata Set are leveraged from prior work identified as the “Thesaurus Approach for the Federal Government”, which produced an XML schema that has provided the basis for the Taxonomy Metadata Set and the Term Metadata Set; however there are some additional metadata components that were extended, altered or added to better support the M&S COI. Italics are used in the Values column of Table 6-2a to denote the type of data to be provided (e.g., text). Normal font is used in this column to denote potential literal values.
### Table 6-2a Definition Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>Abstract idea or notion; a unit of thought; holds term and related terms.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Definition</td>
<td>A statement or formal explanation of the meaning of a concept.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>The source of the definition.</td>
<td>1</td>
<td>text</td>
<td>Official names and URLs are preferred, but specific names of people or agencies are acceptable. Please follow the bibliographic citation conventions.</td>
</tr>
<tr>
<td>Usage</td>
<td>An illustration of the use of the concept, such as in a sentence.</td>
<td>1</td>
<td>text</td>
<td>This is NOT the same as the Usage Metadata Set used for a Resource.</td>
</tr>
<tr>
<td>Synonym</td>
<td>Identifies another term that has equivalent meaning</td>
<td>0..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>RelatedTerm</td>
<td>A concept with which there is an associative semantic relationship.</td>
<td>1..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>Specifies other data deemed relevant by the author of the Taxonomy Definition.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

### 6.2.3 Inclusion Criteria

The metadata components specified in Table 6-2a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

### 6.2.4 Example

Table 6-2b provides an example of the DefinitionSection component that can be reflected within the metacard for an M&S Taxonomy.

### Table 6-2b Taxonomy Definition Metadata Set Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Value</td>
</tr>
<tr>
<td>Concept</td>
<td>Semantic web</td>
</tr>
<tr>
<td>Concept</td>
<td>Knowledge management</td>
</tr>
</tbody>
</table>
7  Workflow Metacards

An M&S Workflow identifies the M&S asset being developed or updated and specifies the states, responsibilities and due dates pertaining to the development and delivery of such asset. An intended side effect of the M&S Workflow is to help encourage development of the resource metadata information pertaining to the asset so that its metacard is not an afterthought. The MSC-DMS provides a means to capture Workflows in a way that allows the discovery metadata relevant to a resource to be captured more naturally and iteratively.

Until version 1.5 of the MSC-DMS, the mechanism to help facilitate the integration of metadata for an asset was often postmortem. However, beginning with version 1.4, Workflow Metacards representing what, who, and when a asset is to be complete allows the checkin process to augment status with metadata applicable for ingestion into the resource metacard. Figure 7-1 provides an illustration of the MSC-DMS Workflow Metacard structure. The boxes with a solid outline represent required metadata components, whereas the boxes with a dashed outline represent optional metadata components.

This section describes the following metadata sets:

- Workflow (root)
- State
7.1 Workflow Metadata Set

The purpose of the Workflow Metadata Set is to direct the work effort pertaining to an M&S asset with the intended side effect of facilitating the documentation of its resource metadata information during the work effort. The Workflow Metadata Set identifies the foundational metadata components of M&S Workflow at the root level. The Workflow Metadata Set illustrated in Figure 7-1.

![Figure 7-1 Workflow Metadata Set](image)

7.1.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Workflow Metacard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>none (this is the root component for a Workflow metacard)</td>
</tr>
<tr>
<td></td>
<td>Multicard.Metacards.Workflows (see Multicard Metadata Set)</td>
</tr>
<tr>
<td>Required:</td>
<td>yes</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Workflow</td>
</tr>
</tbody>
</table>

7.1.2 Table Format

Table 7-1a provides a description of the metadata components pertaining to the Workflow Metadata Set information.
## Table 7-1a Workflow Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>workflowID</td>
<td>Unique identifier associated to the workflow metadata</td>
<td>0..1</td>
<td>URI</td>
<td>A Workflow record can be marked by a unique identifier to support cross referencing by other Resources (via Related Resources). This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>resourceID</td>
<td>Unique identifier associated to a resource id representative of what the responsibility party(s) is to work towards developing</td>
<td>0..1</td>
<td>URI</td>
<td>A Resource record should be marked by a unique identifier to support cross referencing by other Resources including by the Workflow. This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>metacardID</td>
<td>Specifies the unique identifier associated to the metacard id</td>
<td>0..1</td>
<td>URI</td>
<td>A Metacard component of a resource should also be marked by a unique identifier to support cross referencing by other Resources and for the benefit of organizing data by one or more repositories. This should not be confused with version number, or document number.</td>
</tr>
<tr>
<td>taxonomy</td>
<td>Specifies a taxonomy identifier pertaining to a domain vocabulary source, which is applicable in describing the Configuration Management component.</td>
<td>0..1</td>
<td>text</td>
<td>Any component within an MSC-DMS based metacard, which describes or reflects unique semantic information, can be marked by a specific taxonomy identifier to increase semantic interoperability. The value of the taxonomy attribute should match with an identifier value associated within a Related Taxonomy (see Section 4.22). If taxonomy was identified by the Resource component, one does not need to be identified here unless the taxonomy being used for describing this component is different.</td>
</tr>
<tr>
<td>Task</td>
<td>Describes the specific task to be accomplished</td>
<td>1</td>
<td>text</td>
<td>For clarity within the text, a hashtag value in the form #word can be used to identify any term that is discoverable within the taxonomy identified in the supporting taxonomy attribute.</td>
</tr>
<tr>
<td>Manager</td>
<td>Identifies the specific POC managing or responsible for leading the task</td>
<td>0..1</td>
<td></td>
<td>Identifies a POC reference including id and name. - - follows how it is layed out in Rights Metadata Set</td>
</tr>
<tr>
<td>Person</td>
<td>Identifies a Person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.personID</td>
<td>Unique identifier associated to a Person</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name</td>
<td>Name of the person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>First Name of the person</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.middle</td>
<td>Middle Name of the person</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.last</td>
<td>Last Name of the person</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Org</td>
<td>Identifies an Organization</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.organizationID</td>
<td>References the organization ID.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name.value</td>
<td>Identifies the name of the organization.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Provides a description of the POC that may be helpful</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>States</td>
<td>Identifies the progression of the task via a series of states or steps.</td>
<td>1</td>
<td></td>
<td>-- see States Metadata Set</td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the Taxonomy Metacard.</td>
<td>0..1</td>
<td></td>
<td>-- see Releasability Metadata Set</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the Taxonomy Metacard.</td>
<td>0..1</td>
<td></td>
<td>-- see Security Metadata Set (Sublevel – Optional)</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other data deemed relevant by the author of the Taxonomy Definition.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>
7.1.3 Inclusion Criteria

The metadata components specified in Table 7-1a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

7.1.4 Example

Table 7-1b provides an example of the Workflow component that can be reflected within the metacard for an M&S Workflow.

Table 7-1b Workflow Metadata Set Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metadata Component</strong></td>
<td><strong>Values</strong></td>
</tr>
</tbody>
</table>
7.2 States Metadata Set

The purpose of the States Metadata Set is to document certain key metadata information about an M&S Workflow that is applicable to a community or domain area. It is used to document the steps (sequential or parallel) anticipated to produce an M&S asset. The States Metadata Set illustrated in Figure 7.2.

![Figure 7-2 States Metadata Set](image)

7.2.1 Scope

**Metacard Type:** Workflow Metacard  
**Use Path(s):** Workflow.States (*see Workflow Metadata Set*)  
**Required:** yes  
**Schema:** MSC-DMS-Workflow

7.2.2 Table Format

Table 7-2a provides a description of the metadata components pertaining to the Workflow State Metadata Set information. Italics are used in the Values column of Table 7-2a to denote the type of data to be provided (e.g., text). Normal font is used in this column to denote potential literal values.
Table 7-2a Workflow State Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>State.name</td>
<td>Abstract idea or notion; a unit of thought; holds term and related terms.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>A statement or formal explanation of the meaning of a concept.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person</td>
<td>Identifies a Person</td>
<td>1</td>
<td></td>
<td>Person or Org (only one selected per POC identified).</td>
</tr>
<tr>
<td>.personID</td>
<td>Unique identifier associated to a Person</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name</td>
<td>Name of the person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>First Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.middle</td>
<td>Middle Name of the person.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.last</td>
<td>Last Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Org</td>
<td>Identifies an Organization.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.organizationID</td>
<td>References the organization ID.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name.value</td>
<td>Identifies the name of the organization.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Provides a description of the POC that may be helpful</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Due Dates</td>
<td>Anticipated due date</td>
<td>0..many</td>
<td>text</td>
<td>Manager may assign different types of dates.</td>
</tr>
<tr>
<td>Assignment</td>
<td>Used to identify the Metacard Required Elements to be filled in and other aspect related to the task state</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person</td>
<td>Identifies a Person</td>
<td>1</td>
<td></td>
<td>Person or Org (only one selected per POC identified).</td>
</tr>
<tr>
<td>.personID</td>
<td>Unique identifier associated to a Person</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name</td>
<td>Name of the person</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.first</td>
<td>First Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.middle</td>
<td>Middle Name of the person.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.last</td>
<td>Last Name of the person.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Org</td>
<td>Identifies an Organization.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.organizationID</td>
<td>References the organization ID.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>.Name.value</td>
<td>Identifies the name of the organization.</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Provides a description of the POC that may be helpful</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Next State</td>
<td>Identifies the next state that occurs after successful completion</td>
<td>0..many</td>
<td>text</td>
<td>Should reflect the name of another defined state.</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other data deemed relevant by the author of the Taxonomy Definition.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

7.2.3 Inclusion Criteria

The metadata components specified in Table 7-2a are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

7.2.4 Example

Table 7-2b provides an example of State components that can be reflected within the metacard for an M&S Workflow.

Table 7-1b Workflow Metadata Set Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>XML Format</th>
</tr>
</thead>
</table>
| Metadata Component | Value |<ms:States>
| State.name       | Develop Code to Spec |
| Responsibility.Person | </ms:States>
<table>
<thead>
<tr>
<th>State</th>
<th>name</th>
<th>personID</th>
<th>Due Date</th>
<th>Assignment</th>
<th>Next State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>John</td>
<td>00001</td>
<td>2012-05-05</td>
<td>Document Intended Use , and any related resources</td>
<td>Test</td>
</tr>
<tr>
<td>Test</td>
<td>Paul</td>
<td>00002</td>
<td>2012-06-05</td>
<td>Document POC info, keywords</td>
<td>Review</td>
</tr>
<tr>
<td>Review</td>
<td>George</td>
<td>00003</td>
<td>2012-07-05</td>
<td>Document POC info, keywords</td>
<td>Submission</td>
</tr>
<tr>
<td>Submission</td>
<td>Ringo</td>
<td>00004</td>
<td>2012-08-05</td>
<td>Complete remaing metadata elements including publish date</td>
<td>n/a</td>
</tr>
</tbody>
</table>

```xml
<ms:Responsiblity>
  <ms:Person>
    <ms:name>John</ms:name>
    <ms:personID>00001</ms:personID/>
  </ms:Person>
</ms:Responsiblity>
<ms:DueDates>
  <ms:type>created</ms:type>
  <ms:value>2012-05-05</ms:value>
</ms:DueDates>
<ms:Assignment>
  Document Intended Use , and any related resources
</ms:Assignment>
<ms:Responsiblity>
  <ms:Person>
    <ms:name>Paul</ms:name>
    <ms:personID>00002</ms:personID/>
  </ms:Person>
</ms:Responsiblity>
<ms:DueDates>
  <ms:type>created</ms:type>
  <ms:value>2012-06-05</ms:value>
</ms:DueDates>
<ms:Assignment>
  Document POC info, keywords
</ms:Assignment>
<ms:Responsiblity>
  <ms:Person>
    <ms:name>George</ms:name>
    <ms:personID>00003</ms:personID/>
  </ms:Person>
</ms:Responsiblity>
<ms:DueDates>
  <ms:type>created</ms:type>
  <ms:value>2012-07-05</ms:value>
</ms:DueDates>
<ms:Assignment>
  Document POC info, keywords
</ms:Assignment>
<ms:Responsiblity>
  <ms:Person>
    <ms:name>Ringo</ms:name>
    <ms:personID>00004</ms:personID/>
  </ms:Person>
</ms:Responsiblity>
<ms:DueDates>
  <ms:type>created</ms:type>
  <ms:value>2012-08-05</ms:value>
</ms:DueDates>
<ms:Assignment>
  Complete remaing metadata elements including publish date
</ms:Assignment>
```
8 Multicards

Many developers and integrators and the organizations representing such individuals need to be able to package and distribute multiple sets of metacards not just a single metacard. The MSC-DMS provides a means to contain multiple metacards including Resources, Contacts, Taxonomies and Workflows using a Multicard.

Figure 8 provides an illustration of an M&S Multicard Structure. The boxes with a solid outline represent required metadata components, whereas the boxes with a dashed outline represent optional metadata components.

Section 8.1 further describes the Multicard Metadata Set:
8.1 Multicard Metadata Set

The purpose of the Multicard Metadata Set is to create a document with combined metacards, which can include Resources, Contacts, Taxonomy Classifications, or Workflows. The Multicard Metadata Set is used to help distribute multiple metacards as a single file. The Multicard Metadata Set is illustrated in Figure 8-1.

Figure 8-1 Multicard Metadata Set

8.1.1 Scope

<table>
<thead>
<tr>
<th>Metacard Type:</th>
<th>Multicard Metacard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Path(s):</td>
<td>none (this is the root component for a Multicard)</td>
</tr>
<tr>
<td>Required:</td>
<td>yes (if you are building a Multicard)</td>
</tr>
<tr>
<td>Schema:</td>
<td>MSC-DMS-Multicard</td>
</tr>
</tbody>
</table>

8.1.2 Table Format

Table 8-1 provides a description of the metadata components pertaining to the Multicard Metadata Set information. None of the leaf components of the Multicard Structure are required, however, it is
anticipated that the reason for applying this structure is to catalog multiple metacards, and therefore at least one metacard should be contained within a Multicard. Italics are used in the Values column of Table 8-1 to denote the type of data to be provided (e.g., text). Normal font is used in this column to denote potential literal values.

Table 8-1b Multicard Metadata Set

<table>
<thead>
<tr>
<th>Metadata Component</th>
<th>Description</th>
<th>Occurs</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Text identifier for the Multicard</td>
<td>1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Open narrative used to increase comprehension pertaining to the multicard.</td>
<td>0..1</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Metacards</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td>Identifies Resource Metacards</td>
<td>0..many</td>
<td>--</td>
<td>-- see Resource Metadata Set Section 4</td>
</tr>
<tr>
<td>Contacts</td>
<td>Identifies Contact Metacards</td>
<td>0..many</td>
<td>--</td>
<td>-- see Contact Metadata Set Section 5</td>
</tr>
<tr>
<td>Taxonomies</td>
<td>Identifies Taxonomy Metacards</td>
<td>0..many</td>
<td>--</td>
<td>-- see Taxonomy Metadata Set Section 6</td>
</tr>
<tr>
<td>Workflows</td>
<td>Identifies Workflow Metacards</td>
<td>0..many</td>
<td>--</td>
<td>-- see Workflow Metadata Set Section 7</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other types of metacards other information relevant to the multicard</td>
<td>0..many</td>
<td>text</td>
<td></td>
</tr>
<tr>
<td>Releasability</td>
<td>Information about the releasability of the POC information.</td>
<td>0..1</td>
<td>--</td>
<td>-- see Releasability Metadata Set Section 4.23</td>
</tr>
<tr>
<td>Security</td>
<td>Information about the security of the POC information.</td>
<td>0..1</td>
<td>--</td>
<td>-- see Security Metadata Set (Sublevel – Optional) Section 4.24</td>
</tr>
<tr>
<td>other</td>
<td>Specifies other data deemed relevant by the author of the multicard.</td>
<td>0..many</td>
<td>any</td>
<td></td>
</tr>
</tbody>
</table>

8.1.3 Inclusion Criteria

The metadata components specified in Table 6-1 are necessary for all components of this metadata set unless “0..1” or “0..many” is identified in the Occurs column.

8.1.4 Example

Table 8-2 provides an example of a **multicard** component that can be reflected using the MSC-DMS.

Table 8-2b Multicard Metadata Set Example

<table>
<thead>
<tr>
<th>Table Format</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata Component</td>
<td>Value</td>
</tr>
<tr>
<td>Title</td>
<td>Surface_Navy_Models</td>
</tr>
<tr>
<td>Description</td>
<td>The metacards attached represent the models supporting the surface navy</td>
</tr>
<tr>
<td>Resources</td>
<td>-- see Resource Metadata Set</td>
</tr>
<tr>
<td>Contacts</td>
<td>-- see Contacts Metadata Set</td>
</tr>
<tr>
<td>Taxonomies</td>
<td>-- see Taxonomies Metadata Set</td>
</tr>
<tr>
<td>Workflows</td>
<td>-- see Workflows Metadata Set</td>
</tr>
<tr>
<td>Releasability</td>
<td>-- see Releasability Metadata Set for example</td>
</tr>
<tr>
<td>Security</td>
<td>-- see Security Metadata Set for example</td>
</tr>
</tbody>
</table>
This page left intentionally blank
**Appendix A - Glossary**

The definitions identified Table A-1 are common terms used within this document. Given that the meaning of some of these terms differs among domains of interest, these definitions are provided to identify the meaning of these terms in the scope of this document.

**Table A-1 Common Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Related Term</th>
</tr>
</thead>
</table>
| Accreditation     | (1) The official certification that a model, simulation, or federation of models and simulations and its associated data are acceptable for use for a specific purpose. (DoD 5000.59-M)  
                   (2) The official determination that an M&S application and its associated data are acceptable for use for a specific purpose. Accreditation seeks to answer the question "Is this the right M&S to use?" (DON M&S VVA Implementation Handbook) | - M&S Activity  
                   - Validation  
                   - Verification |
| Acquisition       | An M&S Activity that involves the conceptualization, initiation, design, development, test, contracting, production, deployment, logistic support, modification, and disposal of weapons and other systems, supplies, or services to satisfy Department of Defense (DoD) needs intended for use in or in support of military missions. (Glossary of Defense Acquisition Acronyms and Terms) | - M&S Activity |
| Adjunct Tool      | Software and/or hardware that is either used to provide part of a simulation environment or to transform and manage data used by or produced by a simulation environment. Adjunct tools are differentiated from simulation software in that they do not provide a virtual or constructive model to the simulation environment. | - Resource Asset |
| Analysis          | The application of the scientific method to support senior leader planning, programming, and acquisition decision-making. It is the locus of analytical processes and efforts conducted by core, multi-tiered analytical bodies and it is grounded in a systemic and logical examination of the intellectual or material whole and its component parts. These analyses examine best available evidence, are always subject to correction or improvement, and undergo oversight and scrutiny at all levels. Their purpose is to quantify, measure, and demonstrate the relative value and risk of individual or competing programs, systems, or policies to Department decision makers. (Department Analysis Definition from JDS) | - M&S Activity |
| Artifact          | A document, unit of source code, or a data set relevant to a particular model, system, or application, but not necessarily reusable.                                                                                                                                                                                                       | - Asset |
| Asset             | (1) A collection of associated artifacts that together composes a system or subsystem. May exist in two types: resource asset and support asset.  
                   (2) A reusable collection of associated artifacts that together composes a system of subsystem. An asset has capability or content useful beyond its original application, has been developed or enhanced to be of sufficient generality and quality to support reuse, has been approved for reuse, has been documented with pertinent metadata, and has been placed into a repository. | - Artifact  
                   - Resource Asset  
                   - Contact Info  
                   - Taxonomy  
                   - Support Asset |
| Catalog           | A system that accepts, stores, and provides access to metadata, discovery and structural, for assets.                                                                                                                                                                                                                                   | - Registry  
                   - Repository |
| Community of Interest | (1) A collaborative group of people that must exchange information in pursuit of its shared goals, interests, missions, or business processes and therefore must have a shared vocabulary for the information it exchanges.  
                     (2) A group of people who have common concerns and interests. | - Enterprise |
**Component**

- **Component**
  - (1) A subset of the physical realization (and the physical architecture) of the system to which a subset of the system’s function have been (will be) allocated. A component could be integrated hardware and software, a group of people, facilities, or a combination of all of these. (reference (h)).
  - (2) A reusable software package or module that encapsulates a set of related functionality and communicates with other components via an interface.
  - (3) Encapsulated unit of software with a known set of inputs and expected output behavior where the implementation details may be hidden or unknown; it is an interchangeable element of a system that conforms to a specification.

- **Software Component**

**Composability**

- **Composability**
  - “The ability to rapidly select and assemble components to construct meaningful simulation systems to satisfy specific user requirements. Composability includes the framework, body of knowledge, tools, techniques, and standards necessary to enable effective integration, interoperability, and reuse.” (DoD M&S Master Plan)

- **Reuse**
- **Interoperability**

**Conceptual Model**

- **Conceptual Model**
  - A description of “what the [simulation or federation] will represent, the assumptions limiting those representations, and other capabilities needed to satisfy the user’s requirements.”

- **Interface Model Specification**

**Configuration Management**

- **Configuration Management**
  - Recording and reporting of change processing and implementation of a developed asset.

- **M&S Activity**

**Contact Information**

- **Contact Information**
  - Information describing an individual or organization.

- **Contact Metacard**

**Contact Metacard**

- **Contact Metacard**
  - A discovery metacard that describes an individual or organization of value that may able to offer experience, or further information pertaining to an asset of interest.

- **Asset**
- **Contact Information**
- **Metacard**

**Data**

- **Data**
  - (1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means.
  - (2) Representation of real-world facts or concepts that is in a format usable by models during simulation. Differentiated from a model in that M&S Data is generally not itself executable, but is rather input to a model that can be executed. May be operational data, data specifically derived from operational data that has been formatted or augmented for M&S use, or synthetic data created for M&S use.
  - (3) Data produced by a model or simulation that provides a synthetic view of reality.

- **M&S Resource**
- **Resource Asset**

**Data Asset**

- **Data Asset**
  - Any entity containing data. For example, a database is a data asset that contains a set of data records. System or application output files, databases, documents, or web pages. It also includes services that may be provided to access data from an application. For example, a service that returns individual records from a database would be a data asset. Similarly, a web site that returns data in response to specific queries (e.g., www.defenselink.mil) would be a data asset.

- **Data**
- **Data Model**
- **Resource Asset**

**Data Model**

- **Data Model**
  - (1) An abstract but formal representation of entities (distinguishable persons, places, things, events, or concepts about which information is kept), their properties, and relationships among the entities and/or properties.
  - (2) A data model that describes M&S data.

- **Data**

**Data Repository**

- **Data Repository**
  - A specialized database containing information about data, such as meaning, relationships to other data, origin, usage, and format, including the information resources needed by an organization.

- **Catalog**
- **Repository**
- **Shared Space**
- **Storehouse**

---

<p>| Discovery | Metadata that aids in the recall and retrieval of an artifact. May be registered in a metadata catalog. Makes the artifact visible. |
| discovery metadata | Discovery Services |
| query services | Discovery Services |
| search services | Discovery Services |
| discovery metadata catalog | Discovery Services |
| metadata repository | Discovery Services |
| query | Discovery Services |
| registry | Discovery Services |
| repository | Discovery Services |
| search | Discovery Services |
| shared space | Discovery Services |
| DoD Components | Referred to as &quot;the DoD Components,&quot; are identified as the: |
| office of the secretary of defense, | |
| the military departments, | |
| the chairman of the joint chiefs of staff, | |
| the combatant commands, | |
| the office of the inspector general of the department of defense, | |
| the defense agencies, | |
| the DoD field activities, and | |
| all other organizational entities in the Department of Defense. (DoD5025.1-M) | |
| DoD Net-Centric Data Strategy | Defines goals and approaches that allow users and systems to find and access a wide-range of data assets throughout the Department of Defense (DoD) Enterprise. |
| enterprise | DoD Components |
| net-centric | DoD Components |
| Enterprise | Refers to the Department of Defense, its organizations, and related agencies. |
| DoD Components | |
| Experience | Refers to one or more stakeholders knowledge and application of the specified M&amp;S resource | Usage |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensible Markup Language (XML)</td>
<td>A tagging language used to describe and annotate data so it can be consumed by human and system interactions. XML is typically arranged hierarchically using XML element and attributes. It also uses semantically rich labels to describe element and attributes to enable meaningful comprehension. An example of metadata component describing by element named “Person” can appear as follows:</td>
<td></td>
</tr>
<tr>
<td>Federate</td>
<td>(1) A simulation, an interface to a live system, or a supporting utility (or adjunct tool) such as a Logger, Plan View Display, or Stealth Viewer. Such Resources can interoperate with other such software systems in a federation. (2) In HLA, a federate is “an application that may be or is currently coupled with other software applications under a Federation Object Model Document Data (FDD) and runtime infrastructure (RTI).”</td>
<td>Federation, M&amp;S Resource, M&amp;S Software, Member Application</td>
</tr>
<tr>
<td>Federation</td>
<td>(1) A collection of one or more federates capable of interoperating within a distributed synthetic environment. (2) In HLA, “a federation is a named set of federate applications and a common Federation Object Model (FOM) that are used as a whole to achieve some specific objective.” (3) a named set of interacting federate applications, a common object model, and software infrastructure through which they communicate that are used as a whole to achieve some specific objective.</td>
<td>Federation, M&amp;S Resource, Simulation Environment</td>
</tr>
<tr>
<td>Gateway</td>
<td>(1) A member application in a distributed simulation that connects member applications using different interoperability protocols (such as DIS, HLA, or TENA) by translating messages between protocols at run time. (2) Sometimes also referred to as a Bridge</td>
<td>Adjunct Tool</td>
</tr>
<tr>
<td>Interface Model Specification</td>
<td>(1) Set of structures and/or classes including properties, methods, and/or events which serve to provide a well-defined agreement for which applications (M&amp;S software and adjunct tools), federations, components and/or services can connect and communicate. (2) A specification for a specific model (including conceptual models) which, if implemented properly, will yield anticipatable results allowing components and/or services to connect and communicate.</td>
<td>Conceptual Model, M&amp;S Resource, Resource Asset, Simulation Data Exchange Model</td>
</tr>
<tr>
<td>M&amp;S Activity</td>
<td>An M&amp;S procedure or function, involving tasks that consume time and resources, necessary for events or for moving from event to event. M&amp;S Activities include M&amp;S infrastructure management, M&amp;S infrastructure operation, M&amp;S infrastructure design and implementation.</td>
<td>Support Asset</td>
</tr>
<tr>
<td>M&amp;S Environment</td>
<td>A set of interconnected M&amp;S resource assets and support assets needed to conduct an event. M&amp;S Environment includes Policies, Procedures, People, Infrastructure, and Federations.</td>
<td>Support Asset</td>
</tr>
<tr>
<td>M&amp;S Event</td>
<td>An interaction between M&amp;S infrastructure elements that is associated with a particular point in time that results in something happening or changing. M&amp;S Events include tests, analysis, research and design, training, experiments, M&amp;S infrastructure interactions, and internal model interactions.</td>
<td>Support Asset</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>M&amp;S Infrastructure</th>
<th>A set of interconnected M&amp;S support elements that facilitates the use of a set of M&amp;S Resources in a simulation environment. Can include training facilities, test facilities, analysis facilities, labs, computing assets, communications assets, networks, personnel, instrumentation and test equipment, dictionaries and libraries, environments.</th>
<th>• Support Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;S Requirement</td>
<td>(1) Modifications or development of an M&amp;S Resource or significant enhancement to an existing M&amp;S Resource. (2) Often defined within an M&amp;S Resource Document</td>
<td>• M&amp;S Resource Document</td>
</tr>
<tr>
<td>M&amp;S Resource</td>
<td>An asset that contributes to the composition or operation of an M&amp;S event, environment or infrastructure. Includes services, software, components, federations, adjunct tools, data, data models, interface model specifications, and resource specific documents.</td>
<td>• Resource Asset • Resource Metacard</td>
</tr>
<tr>
<td>M&amp;S Resource Document</td>
<td>A document specific to M&amp;S that describes resource information such as the requirements, design, scenario or test plan pertaining to software (that implements a simulation or model), adjunct tool, federation, software component, service, data, data model, or interface model specification.</td>
<td>• Resource Asset • M&amp;S Resource</td>
</tr>
<tr>
<td>M&amp;S Software</td>
<td>Software that implements a model or simulation.</td>
<td>• Adjunct Tools • M&amp;S Resource • Software Component • Resource Asset</td>
</tr>
<tr>
<td>Member Application</td>
<td>An application that is serving some defined role within a simulation environment. This can include live, virtual, or constructive simulation assets, or can be supporting utility programs such as data loggers or visualization tools.</td>
<td>• Federate • Simulation Environment • Software</td>
</tr>
<tr>
<td>Metacard</td>
<td>(1) Discovery metadata for a particular asset. Often stored in a catalog or metadata catalog. (2) Holds key information that describes a resource including its purpose and application, and other information including points of contact, creation date, and, if available, usage experience.</td>
<td>• Discovery Metadata • Resource Metacard • Contact Metacard • Taxonomy Metacard • Multicard</td>
</tr>
<tr>
<td>Metadata</td>
<td>(1) Information describing the characteristics of data; data or information about data; descriptive information about an organization’s data, data activities, systems, and holdings. (2) Data about data; specification of the content, meaning, structure, and use of the data. (3) Searchable data that describes the function and use of an artifact. (4) If the artifact is a model, rather than data, sometimes called a metamodel. (5) Structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities. (6) Information about information. More specifically, information about the meaning of other data.</td>
<td>• Discovery Metadata • Metacard • Metadata Component • Structural Metadata</td>
</tr>
<tr>
<td>Metadata Catalog</td>
<td>A system that contains the instances of metadata associated with individual data assets. Typically, a metadata catalog is a software application that uses a database to store and search records (or cards) that describe such items as documents, images, and videos. Search portals and applications would use metadata catalogs to locate the data assets that are relevant to their query.</td>
<td>• Catalog • Discovery Metadata • Metacard • Metadata Registry • Registry</td>
</tr>
<tr>
<td>Metadata Component</td>
<td>A metadata characteristic, structure or data type often represented as an XML element or attribute.</td>
<td>• Metacard</td>
</tr>
<tr>
<td>Metadata Registry</td>
<td>A system that contains information that describes the structure, format, and definitions of data. Typically, a registry is a software application that uses a database to store and search data, document formats, definitions of data, and relationships among data.</td>
<td>• Registry • Catalog • Metadata • Metadata Catalog</td>
</tr>
<tr>
<td>Metamodel</td>
<td>(1) A model of a model. Metamodels are abstractions of the M&amp;S being developed that use functional decomposition to show relationships, paths of data and algorithms, ordering, and interactions between model components and subcomponents. Metamodels allow the software engineers who are developing the model to abstract details to a level that subject matter experts can validate. (2) A model of a model; an abstraction of other models, relating more generic concepts. (DoD 5000.59-M) (3) Metadata about a model</td>
<td>Metadata</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Model</td>
<td>A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. (DoD 5000.59-M)</td>
<td>Metadata, Analytical Model, Conceptual Model, M&amp;S Tools, Structural Model</td>
</tr>
<tr>
<td>Multicard</td>
<td>The containment of multiple discovery metadata based metacards.</td>
<td>Metadata</td>
</tr>
<tr>
<td>Net-Centric Environment</td>
<td>The realization of a robust, globally interconnected, networked environment in which data is shared timely and seamlessly among users, applications, and platforms.</td>
<td>Net-Centric Environment</td>
</tr>
<tr>
<td>Query</td>
<td>A particular set of criteria and requirements used to search for assets during discovery. Any particular asset may or may not satisfy the query. A query may be saved, modified, and reused.</td>
<td>Discovery, Search</td>
</tr>
<tr>
<td>Registry</td>
<td>A system that accepts, stores, and provides access to schemas or templates for metadata (discovery metadata and/or structural metadata), but not the metadata itself.</td>
<td>Catalog, M&amp;S Catalog, Repository</td>
</tr>
<tr>
<td>Repository</td>
<td>(1) A central place where M&amp;S resources may be cataloged, stored or accessed. (2) A system that accepts, stores, and provides access to assets that may be reused. Typically includes both hardware (e.g., disk storage) and software (e.g., configuration management) aspects. May store software (components or modules), artifacts, metadata, data, or other assets.</td>
<td>Catalog, Data Repository, Registry, Shared Space, Storehouse</td>
</tr>
<tr>
<td>Resource (or Resource Asset)</td>
<td>(1) An asset that is recognized as reusable (2) A reusable asset that has been tagged with discovery metadata.</td>
<td>Adjunct Tool, Data, Data Model, Federation, Interface Model Specification, M&amp;S Resource Document, Service, M&amp;S Software, Software Component, Support Asset</td>
</tr>
<tr>
<td>Resource Metacard</td>
<td>A discovery metacard that describes a resource asset.</td>
<td>Resource Asset, Metacard</td>
</tr>
</tbody>
</table>
| Reuse | (1) The practice of using again, in whole or part, existing M&S tools, data, or services.  
| | (2) Using a previously developed asset again, either for the purpose for which it was originally developed or for a new purpose or in a new context. Reuse may save time, effort, or cost for development or testing. Reuse may add credibility to the new application if the asset underwent verification, validation, and accreditation for its previous use.  
| | (3) The use of M&S assets, (e.g., models, simulations, databases, algorithms, tools) for purposes beyond those for which they were originally developed. Reuse can occur within an organization or in different organizations, or in different application areas. | • Software Reuse |
| Role | A related and coherent set of actions, responsibilities, and authorities which a person or organization may undertake as part of the overall process of developing a federation and/or reusing assets. One of several perspectives a person or organization may have on those processes. Reuse roles include accreditor, federate developer/integrator, federation engineer/tester, federation manager, federation tester, information technology support/hardware engineer, program manager, security engineer, sponsor, user/ operator, and verification and validation agent\textsuperscript{xxi}. | • M&S Contact |
| Scenario | (1) Description of an exercise. It is part of the session database that configures the units and platforms and places them in specific locations with specific missions\textsuperscript{xiii}.  
| | (2) An initial set of conditions and time line of significant events imposed on trainees or systems to achieve exercise objectives\textsuperscript{xiii}.  
| | (3) Often defined within an M&S Resource Document. | • M&S Resource Document |
| Schema | (1) Descriptive representation of data and/or data requirements that describe conceptual, internal, or external views of information/data needs.  
| | (2) A diagrammatic representation, an outline, or a model. In relation to data management, a schema can represent any generic model or structure that deals with the organization, format, structure, or relationship of data. Some examples of schemas are (1) a database table and relationship structure, (2) a document type definition (DTD), (3) a data structure used to pass information between systems, and (4) an XML schema document that represents a data structure and related information encoded as XML. Schemas typically do not contain information specific to a particular instance of data.\textsuperscript{xxiv} | • Metadata  
| | • Metadata Component |
| Search | (1) The portion of the discovery process where assets’ discovery metadata is compared to a query to determine whether or not they meet the criteria expressed in that query.  
| | (2) A single execution of that portion of the discovery process. | • Query  
| | • Discovery |
| Service | (1) A service that provides a capability useful in modeling and simulation; may not be a model or simulation.  
| | (2) Within the context of a Service Oriented Architecture (SOA) an M&S Service is characterized by a well-defined interface that delivers data or interactions in support of M&S.  
| | (3) An activity that enhances the ability to effectively and efficiently use M&S to accomplish a mission.\textsuperscript{xxv}  
| | (4) In a service-oriented architecture, a process or procedure with a well-defined interface that provides specific computation, interaction, or data retrieval functionality and that can be called or invoked by external users. Similar to a component, with encapsulated functionality and interface, but not available for direct integration into a software system; rather invoked via remote procedure call, web service invocation, or similar method. | • M&S Resource  
| | • Resource Asset |
| **Shared Space** | A mechanism that provides data storage and access capabilities for users within a given network space. Enterprise shared space refers to a store of data that is accessible by all users within or across security domains on the GIG. A shared space provides virtual or physical access to any number of data assets (e.g., catalogs, Web sites, registries, classification networks, document storage, and databases). Any user, system, or application that posts data uses shared space. xxvi | • Catalog  
• Registry  
• Repository |
| --- | --- | --- |
| **Simulation** | (1) A sequence of executions of a model.  
(2) A method for implementing a model over time.  
(DoD 5000.59-M) | • M&S Software  
• Resource Asset  
• M&S Resource |
| **Simulation Data Exchange Model** | A specification defining the information exchanged at runtime to achieve a given set of simulation objectives. This includes class relationships, data structures, parameters, and other relevant information. xxviii | • FOM, SOM, DIS PDU  
• Interface Model Specification  
• Resource Asset |
| **Simulation Environment** | A named set of member applications along with a common simulation data exchange model and set of agreements that are used as a whole to achieve some specific objective. xxviii | • Federation  
• M&S Federation |
| **Software Component** | (1) A software component used in the development and composition of software  
(2) A software component used as part of modeling and simulation software. May be source code, binary or byte code, or remote procedures; can be used to construct models and/or provide functionality for simulation systems | • Component  
• M&S Resource  
• Resource Asset  
• M&S Software |
| **Software Design Documents** | (1) A plan or specification identifying the characteristics that affects and controls function or development of an application (M&S software and adjunct tool), federation, component, and/or service.  
(2) Often defined within an M&S Resource Document | • M&S Resource Document |
| **Software Reuse** | The process of implementing or updating software systems using existing software assets. | • Reuse |
| **Storehouse** | Generic term for a storage system; includes repository, catalog, and registry. | • Catalog  
• Registry  
• Repository  
• Shared Space |
| **Structural Metadata** | Metadata that documents the internal characteristics of an artifact, which may include name, description, data constraints, and tag relationships. The HLA OMT standard is an example of structural metadata, where the data described is an HLA object model; an HLA object model is itself structural metadata with respect to a specific run-time set of objects and their attribute values. Makes the artifact understandable. | • Metadata  
• Discovery Metadata |
| **Support Asset** | An asset that is of value to the community, but is not a unit of reuse, and is not normally tagged with discovery metadata. | • M&S Activity  
• M&S Environment  
• M&S Event  
• M&S Infrastructure  
• M&S Related Document  
• Resource Asset |
| **Support Document** | A document not specific to M&S but describes supporting information such as environmental, operational or technical content, that maybe useful in the context of M&S. | • M&S Resource Document  
• Support Asset |
| **Taxonomy** | (1) A classification system. Provides the basis for organizing objects for identification, retrieval and research purposes.  
(2) Represents a designation of controlled vocabulary terms pertaining to a domain or COI.  
(3) Identifies the glossary of terms used by an organization, program or focus group that can be attributed to one or more M&S assets. | • Asset |
| **Taxonomy Metacard** | A discovery metacard describing a taxonomy of terms and definitions | • Metacard  
• Taxonomy |
<table>
<thead>
<tr>
<th>Tools</th>
<th>Description</th>
<th>Relevant Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjunct Tools</td>
<td>Software that implements a model or simulation or an adjunct tool, i.e. software and/or hardware that is either used to provide part of a simulation environment (e.g., to manage the execution of the environment) or to transform and manage data used by or produced by a model or simulation. Adjunct tools are differentiated from simulation software in that they do not provide a virtual or constructive representation as part of a simulation environment.</td>
<td></td>
</tr>
<tr>
<td>Resource Asset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniform Resource Identifier (URI)</td>
<td>A unique identifier used to identify a resource name and/or resource location on the internet.</td>
<td>URL, URN</td>
</tr>
<tr>
<td>Uniform Resource Locator (URL)</td>
<td>A string identifying a specific location for finding a resource on the Internet. Often associated with the term hyperlink. A URL is a type of URI.</td>
<td>URI, URL</td>
</tr>
<tr>
<td>Uniform Resource Name (URN)</td>
<td>A string identifying a unique name of a resource on the Internet. Often associated with the term namespace. A URN is a type of URI.</td>
<td>URI, URL</td>
</tr>
<tr>
<td>Unit of Reuse</td>
<td>A specific, identifiable, and bounded unit that can be searched for, discovered, selected, and reused. May be a concept set (e.g., modeling method), a unit of software (e.g., a component or module), a service, or a data set.</td>
<td>Reuse</td>
</tr>
<tr>
<td>Usage</td>
<td>Refers to the manner in which an M&amp;S resource is intended to be used, and experiences shared of its use (see Experience). Usage defines the purpose, application domain, experiences, limitations, capability and language of origin; all of which provide insight of a resource’s intended and supported use.</td>
<td>Experience</td>
</tr>
</tbody>
</table>
| Validation                                                          | (1) The process of determining the degree to which an M&S resource is an accurate representation of the real world from the perspective of the intended uses of the model. (based on DoD 5000.59-M)  
(2) The process of determining the fitness of an M&S resource and its associated data for a specific purpose. (FEDEP 1.5)  
(3) The process of determining the degree to which an M&S resource and its associated data are an accurate representation of the real world from the perspective of the intended use of the M&S. The informal question often asked for validation is “Was the right M&S built?” (DON M&S VVA Implementation Handbook) | Accreditation, Verification |
| Verification                                                        | (1) The process of determining that an M&S resource accurately represents the developer's conceptual description and specification. Verification also evaluates the extent to which the model or simulation has been developed using sound and established software engineering techniques. (based on DoD 5000.59-M)  
(2) The process of determining that an M&S implementation and its associated data accurately represent the developer’s conceptual description and specifications. An informal question often applied to verification is “Was the M&S built right?” (DON M&S VVA Implementation Handbook) | Accreditation, Validation |
| Workflow                                                             | The sequence of prescribed steps through which a piece of work related to an M&S asset and its supporting Resource Metacard passes from initiation to completion.                                      |                |
# Appendix B – XMLSpy® Schema Design Content Model

Many of the graphic related diagrams provided within this specification were generated using the Altova® XMLSpy® tool. This section describes the symbols and nomenclature found within these diagrams beginning with the Component Symbols identified in Table B-1.9

## Table B-1 Component Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Country" /></td>
<td>Mandatory single component</td>
<td>A rectangle with a solid border identifies a required XML schema component. In this example, a mandatory component of Country is required to be identified within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="Name" /></td>
<td>Mandatory single component</td>
<td>A rectangle with a solid border and line markings in the upper left corner identifies a mandatory XML schema component used to provide simple content (text node only) or mixed content (text and child components). In this example, simple content is denoted because there is no plus sign; a mandatory component of Name containing simple content is defined. This Name component with simple content would be required to be identified within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="Location" /></td>
<td>Single optional component</td>
<td>A rectangle with a dashed border identifies an optional XML schema component. In this example, an optional component of Location may be identified within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="Alias" /></td>
<td>Mandatory multiple component</td>
<td>An overlapping set of rectangles identifies a mandatory XML schema component represented by one or more instances. In this example, up to five Alias component values may be identified within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="Division" /></td>
<td>Mandatory multiple component</td>
<td>A mandatory multiple component with a plus sign identifies a component value containing child components. In this example, an unlimited number of Division component values may be defined with child components within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="xs:field" /></td>
<td>References a global component</td>
<td>The arrow in the bottom left indicates a component referencing a global component, which is defined elsewhere. In this example, an unlimited number of xs:field component values may be defined with child components within the XML instance data.</td>
</tr>
<tr>
<td><img src="image" alt="keybase" /></td>
<td>Complex Type</td>
<td>An irregular hexagon with a plus sign indicates a complex data type. Complex types can be used either as (i) the datatype of a component, or (ii) the base type of another complex type. In this example, keybase is a global complex type used to define other aspects of the XML schema.</td>
</tr>
<tr>
<td><img src="image" alt="Subsidiaries" /></td>
<td>Model Group</td>
<td>An irregular octagon with a plus sign indicates a model group, which can be used to define and reuse component declarations. In this example, Subsidiaries is a global model group that can be used to define components within the XML schema reuse component declarations.</td>
</tr>
<tr>
<td><img src="image" alt="any ##other" /></td>
<td>Wildcards</td>
<td>An irregular octagon with any at left indicates a wildcard, which can be used as placeholders to allow components not specified in the schema or from other namespaces. The common wildcards used within an XML schema are identified below:</td>
</tr>
</tbody>
</table>

---

B.1 Simple Types

A “simple type” component is defined as a data type that only contains values and no component or attributes. For instance, a component declared to be of type `xsd: string` indicates that it is the predefined XML Schema data type for string content. An example is illustrated below:

```
Name
```

In this example, the name for the “simple type” is `Name`, and the type used to define `Name` is `xsd:string`.

B.2 Complex Types

“Complex type” is a data type that may contain attributes, components, and mixed content. An example is illustrated in Figure B-1.
The keybase complex type shown in Figure D-1 was declared with a base type of xs:annotated. The base type is displayed as a rectangle with a dashed gray border and a yellow background color. The child components xs:selector and xs:field extend upon the base type. (Note the tiny arrows in the bottom left corner of the xs:selector and xs:field rectangles. These indicate that both components reference global components of those names.)

B.3 Compositors

A “Compositor” defines an ordered sequence of sub-components (child components). Examples of compositors are identified in Table B-2.

<table>
<thead>
<tr>
<th>Compositor</th>
<th>Diagram</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequence</td>
<td><img src="image" alt="Sequence Diagram" /></td>
<td>In this example, a sequence of components is used for defining an Altova component instance. These sequences of components include a single Name instance, which is a simple type, and may contain an unlimited number of Division instances. Name must precede Division.</td>
</tr>
<tr>
<td>Choice</td>
<td><img src="image" alt="Choice Diagram" /></td>
<td>In this example a choice of components are offered for defining an Altova component instance. These choices include a single Name instance, which is a simple type, or an unlimited number of Division instances.</td>
</tr>
<tr>
<td>All</td>
<td><img src="image" alt="All Diagram" /></td>
<td>In this example, the components are used for defining an Altova component instance that may be in any order. These components include a single Name instance, which is a simple type, and may contain an unlimited number of Division instances. It makes no difference if Division precedes Name or not.</td>
</tr>
</tbody>
</table>
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Appendix C – MSC-DMS Schema Listings

Section 2 provided the MSC-DMS Logical Model identifying the MSC-DMS schemas required to build the various Metacards. This Appendix provides a listing of these schemas.

Note: the <any> and <anyAttribute> XML components are used to make the MSC Discovery Metadata more extensible. They allow documents to contain additional components that are not declared in the main XML schema. The ##other indicates that any well-formed XML that is from a namespace other than the target namespace of the type being defined (unqualified components are not allowed) may be used.

C.1 MSC-DMS-Resource-v1_5.xsd

A listing of the schema for documenting a Resource Metacard is provided below. The root XML element that is required to build a Resource Metacard is Resource. However, a relaxed root metacard can be built using ResourceRELAXED as the root XML element instead. ResourceRELAXED provides a mechanism for developers and integrators to begin the creation of a metacard without having to fill in components that are required to be completed before it can be shared. ResourceRELAXED should only be used if incomplete metacards are anticipated and if XML validation of the metacard is intended to be ignored. Keep in mind most repositories and catalogs will only accept Resource Metacards that comply using Resource as the root XML element.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- version 1.5 - 7/9/2012 -->
<!-- version 1.4 - 12/20/2010 -->
<!-- version 1.3.1 - 3/22/2010 -->
<!-- version 1.3 - 3/4/2010 -->
<!-- version 1.2 - 2/20/2009 -->
<!-- version 1.1 - 8/27/2008 -->
<!-- version 1.0.1 - 1/7/2008 -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://metadata.dod.mil/mdr/ns/MSCDMS/1.5/"
  elementFormDefault="qualified"
  attributeFormDefault="qualified"
  version="1.5">
  <xs:include schemaLocation="MSC-DMS-Resource-Core.xsd"/>
  <xs:include schemaLocation="MSC-DMS-Resource-Supplemental.xsd"/>
  <xs:annotation>
    <xs:documentation>CHANGE LOG:
    7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
    12/20/2010 - updated to incorporate adjudicated 2010 Change Requests (CRs) for version 1.4
    3/22/2010 - fixed name mangling issue regarding POC and POC reference.
    3/04/2010 - Removed taxonomy schema namespace which was not needed. Additional commenting provided.
    2/10/2010 - Completed incorporation of Taxonomy support as adjudicated via 2009 CRs.
    1/20/2010 - Updated to incorporate adjudicated 2009 Change Requests (CRs)
    2/20/2009 - Updated to incorporate latest version of DDMS (version 2.0)
    6/26/2008 - Fixed "security" at the root level to be optional as reflected by spec
    6/29/2008 - First draft release - reflecting adjudicated comments from M&S Catalog Team including adding Releasability, and Associations (was References).
    </xs:documentation>
  </xs:annotation>
  <xs:element name="Resource" type="resourceType"/>
  <xs:element name="ResourceRELAXED" type="resourceTypeRELAXED"/>
</xs:schema>
```

Version 1.5 July 12, 2012
<xs:complexType name="resourceType">
  <xs:annotation>
    <xs:appinfo>
      <mdr:definition>The type definition for the ddms:Resource element.</mdr:definition>
      <mdr:comment>Defines the structure of a MSC-DMS record.</mdr:comment>
    </xs:appinfo>
  </xs:annotation>
  <xs:sequence>
    <xs:element ref="MetacardInfo" minOccurs="0"/>
    <xs:element ref="Title" maxOccurs="unbounded"/>
    <xs:element ref="Version" minOccurs="0"/>
    <xs:element ref="Description" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Usages" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Dates" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Rights" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Source" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Type" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="POCs" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Keywords" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Extensions" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="RelatedResources" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="RelatedTaxonomies" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Releasability" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Security" minOccurs="0" maxOccurs="unbounded"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="resourceID" type="nonEmptyString" use="required"/>
  <xs:attribute name="taxonomy" type="nonEmptyString"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:complexType name="resourceTypeRELAXED">
  <xs:annotation>
    <xs:appinfo>
      <mdr:definition>The type definition for the ddms:Resource element.</mdr:definition>
      <mdr:comment>Defines the structure of a MSC-DMS record.</mdr:comment>
    </xs:appinfo>
  </xs:annotation>
  <xs:sequence>
    <xs:element ref="MetacardInfo" minOccurs="0"/>
    <xs:element ref="Title" maxOccurs="unbounded"/>
    <xs:element ref="Version" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Description" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Usages" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Dates" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Rights" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Source" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Type" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="POCs" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Keywords" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Extensions" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="RelatedResources" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="RelatedTaxonomies" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Releasability" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="Security" minOccurs="0" maxOccurs="unbounded"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="resourceID" type="nonEmptyString"/>
  <xs:attribute name="taxonomy" type="nonEmptyString"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
C.2 MSC-DMS-Resource-Core.xsd

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentions, Inc.) -->
/*! version 1.5 - 7/9/2012 -->
/*! version 1.4 - 12/20/2010 -->
/*! version 1.3.1 - 3/22/2010 -->
/*! version 1.3 - 2/10/2010 -->
/*! version 1.2.1 - 9/9/2009 -->
/*! version 1.2 - 2/20/2009 -->
/*! version 1.1 - 8/27/2008 -->
/*! version 1.0.1 - 1/7/2008 -->

  <xs:include schemaLocation="MSC-DMS-Types.xsd"/>
  <xs:annotation>
    <xs:documentation>CHANGE LOG:
The following changes were incorporated into version 1.5:
7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
12/20/2010 - Updated to incorporate adjudicated 2010 Change Requests (CRs)
3/22/2010 - Fixed name mangling issue regarding POC and POC reference.
2/10/2010 - Completed incorporation of Metacard support as adjudicated via 2009 CRs.
1/20/2010 - Updated to incorporate adjudicated 2009 Change Requests (CRs)
9/2/2009 - Updated import of DDMS to main schema rather than Globals and GeospatialCoverage to resolve namespace conflict
2/20/2009 - Updated to incorporate latest version of DDMS (version 2.0) and IC-ISM (version 2.1)
8/9/2008 - Added ApplicationDomainType to Usage so that it follows patterns for other elements and use of attributes (specifically the "value" attribute).
7/16/2008 - Added sponsorshipID to POC.Person and POC.Organizaion. This allows sponsoring organization to be identified with a Person or Organization
7/16/2008 - Added POCReferenceType including PersonReferenceType and OrgReferenceType so that "Person.Org" could associate to an already identified organization, and "Rights.POC" and "Usage.History.POC" could associate to an already identified POC (person or organizations). This alleviates the requirement that existed before, which required Person and Organization information to be reentered entirely.
7/16/2008 - Cleaned up Org element for POC.Person so that it could associate to existing Organization component(s) rather than repreating creation of Organization information.
7/16/2008 - Integrated Version 1.4.1 of DDMS (was Version 1.4 of DDMS)
7/10/2008 - Added generic Description subelement to POC, Association, Media, History
7/10/2008 - added new items for applicationDomainTypeEnumerations to match spec (analysis, training, t&e, engineering, acquisition, planning
7/10/2008 - Added new items for applicationDomainTypeEnumerations - per comment #28 from M&amp;S Catalog Team
7/05/2008 - Added "Security" as an option for Media Type
6/27/2008 - Made "phone" optional for Organization Type
6/16/2008 - Made "extension" as an optional attribute for Phone Type
6/25/2008 - Added "Releasability" as an option for Media Type
6/24/2008 - Fixed Description.Text type to properly allow text to be inserted between tags
6/02/2008 - Changed "Reference" to "Association - per comment #32 from M&amp;S Catalog Team
6/02/2008 - Fixed "phoneTypeUnion" - per comment #8 from M&amp;S Catalog Team
6/02/2008 - Added "Security" as an option for Title, Description, POC, Association - per comment #7 from M&amp;S Catalog Team
7/10/2008 - First draft release - reflecting adjudicated comments from M&amp;S Catalog Team</xs:documentation>
</xs:annotation>
</xs:schema>
CHANGE LOG:
7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
12/20/2010 - updated to reflect 1.4 approved changes and to map with capability provided by DDMS 3
3/22/2010 - fixed name mangling issue regarding POC and POC reference.
9/2/2009 - updated import of DDMS to main schema rather than Globals and GeospatialCoverage to resolve namespace conflict
2/20/2009 - Updated to incorporate latest version of DDMS (version 2.0)
9/12/2008 - Fixed VVA Type/Subtype Enumeration
7/16/2008 - Used POCReferenceType for VV&AC and ConfigurationManagement. This alleviates the requirement that existed before, which required Person and Organization information to be reentered entirely.
6/26/2008 - Updated HLA coverage to include what HLA FOM / SOM(s) used by name
5/29/2008 - First draft release - reflecting adjudicated comments from M&amp;S Catalog Team

GLOBAL ELEMENTS

Extensions
TemporalCoverage
GeospatialCoverage
HLACoverage
ResourceManagement
VVACoverage

COMPLEX TYPES

Certification

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July 12, 2012

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Section 4.21

Type used to model the virtualCoverage element.

<x:annotation>
  <x:appinfo xml:lang="en">
  Type used to model the virtualCoverage element.
  </x:appinfo>
</x:annotation>

<x:sequence>
  <x:element name="Description" type="descriptionGenericType" minOccurs="0"/>
  <x:element name="Releasability" type="releasabilityType" minOccurs="0"/>
  <x:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
</x:sequence>

<x:attribute name="taxonomy" type="nonEmptyString"/>
<x:anyAttribute namespace="#other" processContents="lax"/>
</x:complexType>

<x:complexType name="VVATypeType">
  <x:attribute name="value" type="xs:string" use="optional" default="VV&A Documentation"/>
  <x:attribute name="subtype" type="vvaSubtypeUnion" use="optional"/>
  <x:attribute name="ads-designation" type="adsDesignationUnion"/>
  <x:any namespace="#other" processContents="lax"/>
</x:complexType>

<!-- VV&A - Section 4.21 -->

<x:complexType name="VVAType">
</x:complexType>

Section 4.17 ("copied" ddms:VirtualCoverageType for 1.5, pushing security down a level ) -->

<x:complexType name="virtualCoverageType">
<x:annotation>
  <x:appinfo xml:lang="en">
  Type used to model the virtualCoverage element.
  </x:appinfo>
</x:annotation>

<x:sequence>
  <x:element name="Description" type="descriptionGenericType" minOccurs="0"/>
  <x:element name="Releasability" type="releasabilityType" minOccurs="0"/>
  <x:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
</x:sequence>

<x:attribute name="taxonomy" type="nonEmptyString"/>
<x:anyAttribute namespace="#other" processContents="lax"/>
</x:complexType>

<!-- Virtual Coverage - Section 4.17 ("copied" ddms:VirtualCoverageType for 1.5, pushing security down a level ) -->

<x:complexType name="virtualCoverageType">
<x:annotation>
  <x:appinfo xml:lang="en">
  Type used to model the virtualCoverage element.
  </x:appinfo>
</x:annotation>

<x:sequence>
  <x:element name="Description" type="descriptionGenericType" minOccurs="0"/>
  <x:element name="Releasability" type="releasabilityType" minOccurs="0"/>
  <x:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
</x:sequence>

<x:attribute name="protocol" type="xs:string" use="optional"/>
<x:attribute name="address" type="xs:string" use="optional"/>
<x:attribute name="taxonomy" type="nonEmptyString"/>
<x:anyAttribute namespace="#other" processContents="lax"/>
</x:complexType>

<!-- Temporal Coverage - Section 4.18 ("copied" ddms:TimePeriodType for 1.5, pushing security down a level ) -->

<x:complexType name="temporalCoverageType">
<x:annotation>
  <x:appinfo xml:lang="en">
  Type used to model the TimePeriod sub-element of the ddms:temporalCoverage element.
  </x:appinfo>
</x:annotation>

<x:sequence>
  <x:element name="Description" type="descriptionGenericType" minOccurs="0"/>
  <x:element name="Releasability" type="releasabilityType" minOccurs="0"/>
  <x:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
</x:sequence>

<x:attribute name="protocol" type="xs:string" use="optional"/>
<x:attribute name="address" type="xs:string" use="optional"/>
<x:attribute name="taxonomy" type="nonEmptyString"/>
<x:anyAttribute namespace="#other" processContents="lax"/>
</x:complexType>
```xml
<xs:complexType>
  <xs:annotation>
    <xs:documentation>&lt;!-- Geospatial Coverage - Section 4.19 ('copied') ddms:PlaceType for 1.5, pushing security down a level -->

    Specifies a user-defined order of an element within the given document. All elements in the document which specify the order attribute should be interpreted as entries in a single, ordered list even though they may appear on different elements. Values must be sequential, starting at 1, and may not contain duplicates.</xs:documentation>
  </xs:annotation>
  <xs:choice maxOccurs="unbounded">
    <xs:element ref="ddms:geographicIdentifier"/>
    <xs:element ref="ddms:boundingBox"/>
    <xs:element ref="ddms:boundingGeometry"/>
    <xs:element ref="ddms:postalAddress"/>
    <xs:element ref="ddms:verticalExtent"/>
  </xs:choice>
  <xs:attribute name="precedence" type="xs:string" use="optional">
    <xs:annotation>
      <xs:documentation>Priority claimed or received as a result of preeminence. When used on the element CountryCode, this attribute is used to distinguish the primary focus when an intelligence product covers two or more countries. Permissible values are Primary, Secondary.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="order" type="xs:int" use="optional">
    <xs:annotation>
      <xs:documentation>Specifies a user-defined order of an element within the given document. All elements in the document which specify the order attribute should be interpreted as entries in a single, ordered list even though they may appear on different elements. Values must be sequential, starting at 1, and may not contain duplicates.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="taxonomy" type="nonEmptyString"/>
</xs:complexType>
```

DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS)
<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="VirtualCoverage" type="virtualCoverageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="TemporalCoverage" type="temporalCoverageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="GeospatialCoverage" type="geospatialCoverageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="HLACoverage" type="HLAType" minOccurs="0"/>
    <xs:element name="VVACoverage" type="VVAType" minOccurs="0"/>
    <xs:element name="ResourceManagement" type="resourceManagementType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:schema>
  <!-- ENUMERATIONS (i.e. Pick List Types) -->
  <xs:simpleType name="certificationLevelTypeEnumerations">
    <xs:restriction base="xs:string">
      <xs:enumeration value="yes"/>
      <xs:enumeration value="no"/>
      <xs:enumeration value="waivered"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="certificationLevelTypeUnion">
    <xs:union memberTypes="certificationLevelTypeEnumerations xs:string"/>
  </xs:simpleType>

  <xs:simpleType name="configurationManagementTypeEnumerations">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Configuration Control Board (CCB)"/>
      <xs:enumeration value="User Group"/>
      <xs:enumeration value="Executive Steering Committee"/>
      <xs:enumeration value="None"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="configurationManagementTypeUnion">
    <xs:union memberTypes="configurationManagementTypeEnumerations xs:string"/>
  </xs:simpleType>

  <xs:simpleType name="vvaSubtypeEnumerations">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Accreditation Plan"/>
      <xs:enumeration value="V&V Plan"/>
      <xs:enumeration value="V&V Report"/>
      <xs:enumeration value="Accreditation Report"/>
      <xs:enumeration value="Accreditation Decision Letter"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="vvaSubtypeUnion">
    <xs:union memberTypes="vvaSubtypeEnumerations xs:string"/>
  </xs:simpleType>
</xs:schema>
C.4 MSC-DMS-Contact-v1_5.xsd

A listing of the schema for documenting a Contact Metacard is provided below. The root XML element that is required to build a Contract Metacard is Contact. However, a relaxed root metacard can be built using ContactRELAXED as the root XML element. ContactRELAXED provides a mechanism for developers and integrators to begin the creation of a Contract Metacard without having to fill in components that are required to be completed before it can be shared. ContactRELAXED should only be used if incomplete metacards are anticipated and if XML validation of the metacard is intended to be ignored. Keep in mind most repositories and catalogs will only accept Contract Metacards that comply using Contact as the root XML element.

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentions, Inc.) -->
<!-- version 1.5 - 7/9/2012 -->
<!-- version 1.4 - 12/20/2010 -->
<x:schema xmlns:xs=http://www.w3.org/2001/XMLSchema
xmlns:mdr=http://metadata.dod.mil/mdr
xmlns:ms=http://www.w3.org/2001/XMLSchema-instance
targetNamespace=http://metadata.dod.mil/mdr/ns/MSCDMS/1.5/elementFormDefault="qualified" attributeFormDefault="qualified" version="1.5">
  <x:include schemaLocation="MSC-DMS-Types.xsd"/>
  <x:schemaLocation>CHANGE LOG:
    7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
    12/20/2010 - created schema to represent Contact Metacards
  </x:schemaLocation>
  <x:element name="Contact" type="contactNoRefType"/>
  <x:element name="ContactRELAXED" type="contactNoRefTypeRELAXED"/>
  <x:element name="Person" type="personType"/>
  <x:element name="Organization" type="organizationType"/>
</x:schema>

C.5 MSC-DMS-Taxonomy-v1_5.xsd

A listing of the schema for documenting a Taxonomy Metacard is provided below. The root XML element that is required to build a Taxonomy Metacard is Taxonomy. However, a relaxed root metacard can be built using TaxonomyRELAXED as the root XML element instead. TaxonomyRELAXED provides a mechanism for developers and integrators to begin the creation of a metacard without having to fill in components that are required to be completed before it can be shared. TaxonomyRELAXED should only be used if incomplete metacards are anticipated and if XML validation of the metacard is intended to be ignored. Keep in mind most repositories and catalogs will only accept Taxonomy Metacards that comply using Taxonomy as the root XML element.

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Bertram Chase (private) -->
<!-- version 1.5 - 7/9/2012 -->
<!-- version 1.4 - 12/20/2010 -->
<x:schema xmlns:xs=http://www.w3.org/2001/XMLSchema
xmlns:mdr=http://metadata.dod.mil/mdr
xmlns:ms=http://www.w3.org/2001/XMLSchema-instance
targetNamespace=http://metadata.dod.mil/mdr/ns/MSCDMS/1.5/elementFormDefault="qualified" attributeFormDefault="qualified" version="1.5">
  <x:include schemaLocation="DoD-Glossary.xsd"/>
<xs:include schemaLocation="MSC-DMS-Types.xsd"/>
<xs:annotation>
  <xs:documentation>CHANGE LOG:
7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
12/20/2010 - created separate schema to support creation of Taxonomy Classifications, which can be cited by an
MSC-DMS Resource</xs:documentation>
</xs:annotation>
<!-- GLOBAL ELEMENTS -->
<xs:element name="Taxonomy" type="taxonomyType"/>
<xs:element name="DefinitionRELAXED" type="taxonomyTypeRELAXED"/>
<xs:element name="DefinitionSection" type="DefinitionSectionType"/>
<xs:element name="DefinitionSectionRELAXED" type="DefinitionSectionTypeRELAXED"/>
<!-- COMPLEX TYPES -->
<!-- taxonomy - Section 6.1 - updated for 1.4 of the MSC-DMS -->
<xs:complexType name="taxononyType">
  <xs:sequence>
    <xs:element name="Title" type="titleGenericType"/>
    <xs:element name="Description" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Version" type="versionType" minOccurs="0"/>
    <xs:element name="POCs" type="poesType" minOccurs="0"/>
    <xs:element name="Term" type="TermType" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="taxonomyID" type="xs:anyURI"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
<xs:complexType name="taxonomyTypeRELAXED">
  <xs:sequence>
    <xs:element name="Title" type="titleGenericType" minOccurs="0"/>
    <xs:element name="Description" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Version" type="versionType" minOccurs="0"/>
    <xs:element name="POCs" type="poesType" minOccurs="0"/>
    <xs:element name="Term" type="TermTypeRELAXED" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="taxonomyID" type="xs:anyURI"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
</xs:schema>

C.6 DoD-Glossary.xsd

<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentions, Inc.) -->
<!-- this reflects an existing schema identified as the DoD Glossary and is used by the MSC-DMS to classify taxonomies -->
<!-- W3C Schema generated by XMLSpy v2004 rel. 3 U (http://www.xmlspy.com) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified">
  <xs:element name="Acronym" type="xs:string"/>
  <xs:element name="Characteristic" type="xs:string"/>
  <xs:element name="Concept" type="xs:string"/>
  <xs:element name="Definition" type="xs:string"/>
  <xs:complexType name="DefinitionSectionType">
    <xs:sequence>
      <xs:element ref="Concept" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element ref="Definition"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>

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<xs:element ref="Reference" minOccurs="0"/>
</xs:element>
<xs:element ref="Usage" minOccurs="0" />
<xs:element name="Usage" type="xs:string" minOccurs="0" />
<xs:element ref="Synonym" minOccurs="0" maxOccurs="unbounded"/>
<xs:element ref="RelatedTerm" minOccurs="0" maxOccurs="unbounded"/>
<xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
<xs:complexType name="DefinitionSectionTypeRELAXED">
  <xs:sequence>
    <xs:element name="Concept" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Definition" type="xs:string" minOccurs="0" />
    <xs:element ref="Usage" minOccurs="0" />
    <xs:element name="Usage" type="xs:string" minOccurs="0" />
    <xs:element ref="Synonym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="RelatedTerm" minOccurs="0" maxOccurs="unbounded"/>
    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="Designation" type="xs:string"/>
<xs:element name="ExpandedAcronym" type="xs:string"/>
<xs:element name="Glossary" type="DefinitionSectionTypeRELAXED"/>
<xs:complexType name="TermType">
  <xs:sequence>
    <xs:element name="Term" type="TermTypeRELAXED" maxOccurs="unbounded"/>
    <xs:element name="Reference" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="RelatedTerm" type="xs:string" minOccurs="0" maxOccurs="0"/>
    <xs:element name="Acronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="ExpandedAcronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="DefinitionSection" type="DefinitionSectionTypeRELAXED" minOccurs="0" maxOccurs="0"/>
    <xs:element ref="Usage" minOccurs="0" maxOccurs="0"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="Name" type="xs:string"/>
<xs:element name="Nomenclature" type="xs:string"/>
<xs:element name="PreferredTerm" type="xs:string"/>
<xs:element name="RelatedTerm" type="xs:string"/>
<xs:element name="Synonym" type="xs:string"/>
<xs:complexType name="TermTypeRELAXED">
  <xs:sequence>
    <xs:element name="Name"/>
    <xs:element ref="Acronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="ExpandedAcronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="DefinitionSection" type="DefinitionSectionTypeRELAXED" minOccurs="0" maxOccurs="0"/>
    <xs:element ref="Usage" type="xs:string" minOccurs="0" maxOccurs="0"/>
  </xs:sequence>
</xs:complexType>
<xs:attribute name="version" type="xs:string"/>
<xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
<xs:element name="ID" type="xs:ID"/>
<xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
<xs:complexType name="TermTypeRELAXED">
  <xs:sequence>
    <xs:element name="Name"/>
    <xs:element ref="Acronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element ref="ExpandedAcronym" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="DefinitionSection" type="DefinitionSectionTypeRELAXED" minOccurs="0" maxOccurs="0"/>
    <xs:element ref="Usage" type="xs:string" minOccurs="0" maxOccurs="0"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
C.7 MSC-DMS-Workflow-v1_5.xsd

A listing of the schema for documenting a Workflow Metacard is provided below. The root XML element that is required to build a Workflow Metacard is Workflow. However, a relaxed root metacard can be built using WorkflowRELAXED as the root XML element instead. WorkflowRELAXED provides a mechanism for developers and integrators to begin the creation of a metacard without having to fill in components that are required to be completed before it can be shared. WorkflowRELAXED should only be used if incomplete metacards are anticipated and if XML validation of the metacard is intended to be ignored. Keep in mind most repositories and catalogs will only accept Workflow Metacards that comply using Workflow as the root XML element.

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentions, Inc.) -->
<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Bertram Chase (private) -->
<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentions, Inc.) -->

C.8 MSC-DMS-Types.xsd

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- edited with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Bertram Chase (private) -->

Version 1.5 July 12, 2012
2/17/2010 - removed duplicate "used" enumeration from dateTimeEnumerations
2/10/2010 - completed incorporation of Taxonomy support as adjudicated via 2009 CRs.
1/20/2009 - updated schema to reflect ALL complex types in alphabetical order. This allows MSC-DMS components to be used for supporting other types of assets.
9/11/2009 - created separate schema to represent common types shared across core and supplemental (to resolve namespace conflicts for loading in MDR).

<xs:documentation>
</xs:documentation>

<!--SIMPLE TYPES-->  
<xs:simpleType name="nonEmptyString">  
  <xs:restriction base="xs:string">  
    <xs:minLength value="1"/>
  </xs:restriction>
</xs:simpleType>
</!-- COMPLEX TYPES -->

<xs:complexType name="addressInfoType">
  <xs:sequence>
    <xs:element name="AddressLine1" type="genericStringValue" minOccurs="0"/>
    <xs:element name="AddressLine2" type="genericStringValue" minOccurs="0"/>
    <xs:element name="AddressLine3" type="genericStringValue" minOccurs="0"/>
    <xs:element name="City" type="genericStringValue" minOccurs="0"/>
    <xs:element name="State" type="genericStringValue" minOccurs="0"/>
    <xs:element name="Country" type="genericStringValue" minOccurs="0"/>
    <xs:element name="PostalCode" type="genericStringValue" minOccurs="0"/>
    <xs:annotation>
      <xs:documentation>0</xs:documentation>
    </xs:annotation>
    <xs:annotation>
      <xs:appinfo>
        mdr:definition>Type used to model the ddmsSource element.</mdr:definition>
      </xs:appinfo>
    </xs:annotation>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="applicationDomainType">
  <xs:sequence>
    <xs:element name="value" type="applicationDomainTypeUnion" use="required"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="associationsType">
  <xs:sequence>
    <xs:element name="Association" type="associationType" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="associationType">
  <xs:sequence>
    <xs:element name="Association" type="associationType" minOccurs="0"/>
    <xs:element name="title" type="string" minOccurs="0"/>
    <xs:anyAttribute namespace="#other" processContents="lax"/>
  </xs:sequence>
</xs:complexType>

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  <xs:sequence>
    <xs:element name="Text" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="AssociationRelationshipUnion">
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    <xs:element name="businessRelationship" type="businessRelationUnion" minOccurs="0"/>
    <xs:element name="description" type="descriptionGenericType" minOccurs="0"/>
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    <xs:any namespace="#other" processContents="lax"/>
  </xs:sequence>
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      <xs:element name="Person" type="personType"/>
      <xs:element name="Organization" type="organizationType"/>
      <xs:element name="Service" type="serviceType"/>
    </xs:choice>
    <xs:element name="Description" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Image" type="imageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:complexType name="contactNoRefTypeRELAXED">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Person" type="personType" minOccurs="0"/>
      <xs:element name="Organization" type="organizationType" minOccurs="0"/>
      <xs:element name="Service" type="serviceType" minOccurs="0"/>
    </xs:choice>
    <xs:element name="Description" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Image" type="imageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
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  <xs:sequence>
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      <xs:element name="Organization" type="organizationType"/>
      <xs:element name="Service" type="serviceType"/>
    </xs:choice>
    <xs:element name="Description" type="descriptionGenericType" minOccurs="0"/>
    <xs:element name="Image" type="imageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

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      <xs:element name="Organization" type="organizationType" minOccurs="0"/>
      <xs:element name="Service" type="serviceType" minOccurs="0"/>
    </xs:choice>
    <xs:element name="Description" type="descriptionGenericTypeNoTax" minOccurs="0"/>
    <xs:element name="Image" type="imageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
    <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
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<xs:complexType name="dateMaxType">
  <xs:attribute name="value" type="xs:date" use="required"/>
  <xs:attribute name="type" type="dateTypeUnion" use="required"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
</xs:complexType>

<xs:complexType name="dateMinType">
  <xs:attribute name="value" type="xs:date" use="required"/>
  <xs:attribute name="type" type="dateTypeUnion"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>
</xs:complexType>

<xs:complexType name="datesType">
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  </xs:sequence>
</xs:complexType>
</xs:complexType>

<xs:complexType name="descriptionGenericType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
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      <xs:anyAttribute namespace="#other" processContents="lax"/>
    </xs:extension>
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</xs:complexType>

<xs:complexType name="descriptionGenericTypeNoTax">
  <xs:simpleContent>
    <xs:extension base="xs:string">
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    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:complexType name="descriptionGenericTypeX">
  <xs:sequence>
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    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:complexType>

<xs:complexType name="descriptionType">
  <xs:sequence>
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    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Security" type="securityOptionType"/>
    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:complexType>

<xs:complexType name="emailType">
  <xs:attribute name="type" type="emailTypeUnion" use="required"/>
  <xs:attribute name="address" type="xs:string" use="required"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
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</xs:complexType>

<xs:complexType name="formatType">
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    <xs:extension base="ddms:FormatType">
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    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:complexType>

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<xs:complexType name="experienceType">
  <xs:sequence>
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  </xs:sequence>
</xs:complexType>
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<xs:attribute name="name" type="stringType"/>
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<xs:attribute name="id" type="xs:string"/>
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<xs:attribute name="title" type="stringType"/>
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<xs:attribute name="name" type="stringType"/>
<xs:attribute name="address" type="xs:string"/>
<xs:attribute name="email" type="#other" processContents="lax"/>
<xs:attribute name="format" type="ddms:FormatType"/>
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<xs:attribute name="version" type="xs:string"/>
<xs:attribute name="title" type="stringType"/>
<xs:attribute name="description" type="descriptionGenericType"/>
<xs:attribute name="name" type="stringType"/>
<xs:attribute name="address" type="xs:string"/>
<xs:attribute name="email" type="#other" processContents="lax"/>
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<xs:attribute name="genericValue" type="xs:string"/>
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    </xs:sequence>
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    <xs:attribute name="alt" type="xs:string" use="required"/>
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    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:complexType name="languageType">
    <xs:extension base="ddms:CompoundLanguageIdentifierType">
        <xs:annotation>
            <xs:appinfo xml:lang="en">
                Type used to model the ddms:keyword element.
                Allowed extension for allowing automated populators to give extra values for confidence and relativity.
            </xs:appinfo>
        </xs:annotation>
    </xs:extension>
</xs:complexType>

<xs:complexType name="locationType">
    <xs:attribute name="value" type="xs:string" use="required"/>
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</xs:complexType>

<xs:complexType name="metacardInfoType">
    <xs:sequence>
        <xs:element name="Dates" type="dateTimeType" maxOccurs="unbounded"/>
        <xs:element name="POCs" type="pocsType"/>
        <xs:element name="Description" type="descriptionType" minOccurs="0"/>
        <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
        <xs:element name="Security" type="securityOptionType" minOccurs="0"/>
        <xs:element name="metacardID" type="nonEmptyString" use="required"/>
        <xs:attribute name="taxonomy" type="nonEmptyString"/>
        <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="metacardID" type="nonEmptyString" use="required"/>
    <xs:attribute name="taxonomy" type="nonEmptyString"/>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

Version 1.5  July 12, 2012
A method of categorizing the subject of a document in a fashion understandable by DDNI-A

A method of categorizing the coverage of a document in a fashion understandable by DDNI-A

DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS)

<xs:complexType name="mediaType">
  <xs:sequence>
    <xs:element name="Format" type="xsd:string" maxOccurs="unbounded"/>
    <xs:element name="CodeLanguage" type="codeLanguageValueUnion" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Location" type="descriptionGenericNoTaxType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Description" type="descriptionGenericNoTaxType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Security" type="securityOptionType" minOccurs="0" maxOccurs="unbounded"/>
    <any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
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  <xs:attribute name="taxonomy" type="nonEmptyString"/>
  <xs:anyAttribute namespace="#other" processContents="lax"/>
</xs:complexType>

<xs:complexType name="NonStateActorCoverageType">
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    <xs:attribute name="coverage" type="xsd:string" use="required"/>
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    <xs:attribute name="subject" type="xsd:string" use="required"/>
  </xs:sequence>
</xs:complexType>

A method of categorizing the subject of a document in a fashion understandable by DDNI-A

A method of categorizing the coverage of a document in a fashion understandable by DDNI-A
<xs:element name="ContactInstruction" type="genericStringValue" maxOccurs="unbounded"/>
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</xs:complexType>
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<xs:attribute name="middle" type="xs:string" use="optional"/>
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<xs:attribute name="name" type="xs:string" use="optional"/>
<xs:anyAttribute namespaces="#other" processContents="lax"/>
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<xs:element name="Email" type="emailType" minOccurs="0" maxOccurs="unbounded"/>
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<xs:choice>
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<xs:element name="Org" type="orgReferenceType"/>
</xs:choice>
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</xs:sequence>
</xs:complexType>
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  <xs:anyAttribute namespace="##other" processContents="lax"/>
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<xs:complexType name="pocsType">
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  </xs:sequence>
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    <xs:attribute name="role" type="pocRoleUnion" default="unspecified"/>
  </xs:extension>
</xs:complexType>
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  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<xs:complexType name="rightsType">
  <xs:sequence>
    <xs:extension base="ddms:RightsType">
      <xs:element name="POCrefer" type="pocReferenceType" minOccurs="0">
        <xs:any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="taxonomy" type="nonEmptyString"/>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
  </xs:extension>
</xs:complexType>
<xs:complexType name="securityType">
  <xs:annotation>
    <mxr:definition>Type used to model the ddms:source element.</mxr:definition>
    <mxr:appinfo/>
  </xs:annotation>
  <xs:attributeGroup ref="ddms:SecurityAttributesGroup"/>
</xs:complexType>
<xs:complexType name="securityOptionType">
  <xs:annotation>
    <mxr:definition>Type used to model the ddms:source element.</mxr:definition>
    <mxr:appinfo/>
  </xs:annotation>
  <xs:attributeGroup ref="ddms:SecurityAttributesOptionGroup"/>
</xs:complexType>
<xs:complexType name="topLevelSecurityType">
  <xs:annotation>
    <mxr:definition>Type used to model the ddms:source element.</mxr:definition>
    <mxr:appinfo/>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="noticeList" type="ddms:NoticeListType" minOccurs="0"/>
    <xs:element ref="ntk:Access" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS)

<xs:complexType name="stringType">
  <xs:extension base="xs:string">
    <xs:attribute namespace="##other" processContents="lax"/>
  </xs:extension>
</xs:complexType>

<xs:complexType name="relatedResourcesType">
  <xs:sequence>
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  </xs:sequence>
</xs:complexType>

<xs:complexType name="relatedResourceTypeX">
  <xs:sequence>
    <xs:element name="Link" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:complexType name="linklocatorAttrs">
    <xs:attributeGroup ref="xlink:locatorAttrs"/>
  </xs:complexType>
</xs:complexType>

<xs:complexType name="relatedResourceType">
  <xs:sequence>
    <xs:element name="Resource" type="relatedResourceType" maxOccurs="unbounded"/>
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  </xs:sequence>
</xs:complexType>

<xs:complexType name="relatedResourceTypeX">
  <xs:sequence>
    <xs:element name="Link" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:complexType name="linklocatorAttrs">
    <xs:attributeGroup ref="xlink:locatorAttrs"/>
  </xs:complexType>
</xs:complexType>

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    <xs:element name="Link" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:complexType name="linklocatorAttrs">
    <xs:attributeGroup ref="xlink:locatorAttrs"/>
  </xs:complexType>
</xs:complexType>

The type entity used by the ddms:relationship element. Each ddms:relatedResource element designates the relationship and the directionality of the relationship between the resource described by the parent ddms:Resource and any ddms:RelatedResource elements.

The type entity used by the ddms:relationship element. Each ddms:relatedResource element designates the relationship and the directionality of the relationship between the resource described by the parent ddms:Resource and any ddms:RelatedResource elements.

The type entity used by the ddms:relationship element. Each ddms:relatedResource element designates the relationship and the directionality of the relationship between the resource described by the parent ddms:Resource and any ddms:RelatedResource elements.
<xs:complexType name="relatedTaxonomiesType">
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  </xs:sequence>
</xs:complexType>

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    <xs:element name="RelatedTaxonomy" type="relatedTaxonomyType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!-- Section 4.3 -->
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  </xs:sequence>
</xs:complexType>

<xs:complexType name="titleType">
  <xs:sequence>
    <xs:element name="Title" type="titleType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="taxonomyType">
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  </xs:sequence>
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    <xs:element name="Description" type="descriptionType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="titleGenericType">
  <xs:sequence>
    <xs:element name="RelatedTaxonomy" type="relatedTaxonomyType" maxOccurs="unbounded"/>
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  </xs:sequence>
</xs:complexType>

<xs:complexType name="relatedTaxonomyGenericType">
  <xs:sequence>
    <xs:element name="RelatedTaxonomy" type="relatedTaxonomyType" maxOccurs="unbounded"/>
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  </xs:sequence>
</xs:complexType>

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    <xs:element name="ApplicationDomain" type="applicationDomainType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

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    <xs:element name="Capability" type="capabilityType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="experienceType">
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  </xs:sequence>
</xs:complexType>

<xs:complexType name="languageType">
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  </xs:sequence>
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  </xs:sequence>
</xs:complexType>
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  <xs:attribute name="value" type="xs:string" use="required"/>
</xs:complexType>

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  </xs:sequence>
</xs:complexType>

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    <xs:element name="Workflow" type="workflowType"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="Workflow">
  <xs:sequence>
    <xs:element name="Task" type="titleGenericType"/>
    <xs:element name="Manager" type="pocReferenceType" minOccurs="0"/>
    <xs:element name="States" type="workflowStatesType" minOccurs="0"/>
    <xs:element name="Releasability" type="releasabilityType" minOccurs="0"/>
    <xs:element name="Task" type="securityType" minOccurs="0"/>
    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
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  <xs:attribute name="value" type="xs:date" use="required"/>
</xs:complexType>

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    <xs:element name="From" type="dateBasicType" minOccurs="0"/>
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  </xs:sequence>
</xs:complexType>

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    <xs:any namespace="#other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType>
  <xs:complexContent>
    <xs:restriction base="xs:complexType"/>
  </xs:complexContent>
</xs:complexType>

<!ENTITY adDesignationEnumerations "Category I|Category II|Category III|Approved - T|Other - T"/>

<!ENTITY adDesignationUnion "=">

<!ENTITY applicationDomainTypeEnumerations "analysis|training|engineering|acquisition|planning|assessment|doctrine|logistics|support to ops|intelligence"/>

<!ENTITY applicationDomainTypeUnion "=">

<!ENTITY associationQualifierEnumerations "URL|code|image|text|doc"/>

<!ENTITY associationQualifierUnion "=">

<!ENTITY associationRelationshipEnumerations "has-a|is-part-of|is-type-of|is-described-by"/>

<!ENTITY associationRelationshipUnion "=">

<!ENTITY associationTypeEnumerations "=">

<!ENTITY processContents "lax">

<!ENTITY #other "##other" minOccurs="0" maxOccurs="unbounded"/>

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  <xsd:attribute name="grant-number" type="nonEmptyString"/>
  <xsd:attribute name="program-element-number" type="nonEmptyString"/>
  <xsd:attribute name="project-number" type="nonEmptyString"/>
  <xsd:attribute name="task-number" type="nonEmptyString"/>
  <xsd:attribute name="work-unit-number" type="nonEmptyString"/>
  <xsd:anyAttribute name="#other" processContents="lax"/>
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<xsd:complexType name="contractTypeUnion">
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  <xsd:attribute name="grant-number" type="nonEmptyString"/>
  <xsd:attribute name="program-element-number" type="nonEmptyString"/>
  <xsd:attribute name="project-number" type="nonEmptyString"/>
  <xsd:attribute name="task-number" type="nonEmptyString"/>
  <xsd:attribute name="work-unit-number" type="nonEmptyString"/>
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  <xsd:attribute name="project-number" type="nonEmptyString"/>
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  <xsd:attribute name="work-unit-number" type="nonEmptyString"/>
  <xsd:anyAttribute name="#other" processContents="lax"/>
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<xsd:complexType name="contractTypeUnion">
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  <xsd:attribute name="grant-number" type="nonEmptyString"/>
  <xsd:attribute name="program-element-number" type="nonEmptyString"/>
  <xsd:attribute name="project-number" type="nonEmptyString"/>
  <xsd:attribute name="task-number" type="nonEmptyString"/>
  <xsd:attribute name="work-unit-number" type="nonEmptyString"/>
  <xsd:anyAttribute name="#other" processContents="lax"/>
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<xsd:complexType name="contractTypeUnion">
  <xsd:sequence/>
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  <xsd:attribute name="grant-number" type="nonEmptyString"/>
  <xsd:attribute name="program-element-number" type="nonEmptyString"/>
  <xsd:attribute name="project-number" type="nonEmptyString"/>
  <xsd:attribute name="task-number" type="nonEmptyString"/>
  <xsd:attribute name="work-unit-number" type="nonEmptyString"/>
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  <xs:restriction base="xs:string">
    <xs:enumeration value="resource_asset"/>
    <xs:enumeration value="contact"/>
    <xs:enumeration value="taxonomy"/>
    <xs:enumeration value="association"/>
    <xs:enumeration value="model"/>
    <xs:enumeration value="platform"/>
    <xs:enumeration value="operation"/>
    <xs:enumeration value="support"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="associationTypeUnion">
  <xs:union memberTypes="associationTypeEnumerations" base="xs:string">
    <xs:restriction base="xs:string">
      <xs:enumeration value="AKO"/>
      <xs:enumeration value="DKO"/>
      <xs:enumeration value="JWICS"/>
      <xs:enumeration value="SIPRNET"/>
      <xs:enumeration value="NIPRNET"/>
      <xs:enumeration value="BITMAP"/>
      <xs:enumeration value="PNG"/>
      <xs:enumeration value="JPG"/>
      <xs:enumeration value="GIF"/>
      <xs:enumeration value="TIFF"/>
      <xs:enumeration value="XML"/>
      <xs:enumeration value="HTML"/>
      <xs:enumeration value="Java"/>
      <xs:enumeration value="Javascript"/>
      <xs:enumeration value="Java"/>
      <xs:enumeration value="C#"/>
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      <xs:enumeration value="Fortran"/>
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      <xs:enumeration value="HTML"/>
      <xs:enumeration value="Java"/>
      <xs:enumeration value="Javascript"/>
      <xs:enumeration value="Objective-C"/>
      <xs:enumeration value="Pascal"/>
      <xs:enumeration value="PHP"/>
      <xs:enumeration value="SQL"/>
    </xs:restriction>
  </xs:union>
</xs:simpleType>

<xs:simpleType name="codeLanguageValueUnion">
  <xs:union memberTypes="codeLanguageValueEnumerations" base="xs:string">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Ada"/>
      <xs:enumeration value="C/C++"/>
      <xs:enumeration value="C#"/>
      <xs:enumeration value="Fortran"/>
      <xs:enumeration value="HTML"/>
      <xs:enumeration value="Java"/>
      <xs:enumeration value="Javascript"/>
      <xs:enumeration value="Objective-C"/>
      <xs:enumeration value="Pascal"/>
      <xs:enumeration value="PHP"/>
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      <xs:enumeration value="Java"/>
      <xs:enumeration value="Javascript"/>
      <xs:enumeration value="Objective-C"/>
      <xs:enumeration value="Pascal"/>
      <xs:enumeration value="PHP"/>
      <xs:enumeration value="SQL"/>
    </xs:restriction>
  </xs:union>
</xs:simpleType>

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  <xs:union memberTypes="dateTypeEnumerations" base="xs:string">
    <xs:restriction base="xs:string">
      <xs:enumeration value="created"/>
      <xs:enumeration value="posted"/>
      <xs:enumeration value="accepted"/>
      <xs:enumeration value="modified"/>
      <xs:enumeration value="validTil"/>
      <xs:enumeration value="infoCutOff"/>
      <xs:enumeration value="used"/>
      <xs:enumeration value="v&v"/>
      <xs:enumeration value="accreditation"/>
      <xs:enumeration value="retired"/>
      <xs:enumeration value="lastVerified"/>
    </xs:restriction>
  </xs:union>
</xs:simpleType>

<xs:simpleType name="emailTypeUnion">
  <xs:union memberTypes="emailTypeEnumerations" base="xs:string">
    <xs:restriction base="xs:string">
      <xs:enumeration value="work"/>
      <xs:enumeration value="home"/>
      <xs:enumeration value="NIPRNET"/>
      <xs:enumeration value="SIPRNET"/>
      <xs:enumeration value="TWICS"/>
      <xs:enumeration value="DKO"/>
      <xs:enumeration value="AKO"/>
    </xs:restriction>
  </xs:union>
</xs:simpleType>

<xs:simpleType name="imageTypeUnion">
  <xs:union memberTypes="imageTypeEnumerations" base="xs:string">
    <xs:restriction base="xs:string">
      <xs:enumeration value="BITMAP"/>
      <xs:enumeration value="PNG"/>
      <xs:enumeration value="JPG"/>
      <xs:enumeration value="GIF"/>
      <xs:enumeration value="TIFF"/>
    </xs:restriction>
  </xs:union>
</xs:simpleType>
<xs:union memberTypes="imageTypeEnumerations xs:string"/>
</xs:simpleType>

<xs:simpleType name="organizationTypeEnumerations">
  <xs:restriction base="xs:string">
    <xs:enumeration value="government"/>
    <xs:enumeration value="academia"/>
    <xs:enumeration value="industry"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="organizationTypeUnion">
  <xs:union memberTypes="organizationTypeEnumerations xs:string"/>
</xs:simpleType>

<xs:simpleType name="phoneTypeEnumerations">
  <xs:restriction base="xs:string">
    <xs:enumeration value="work"/>
    <xs:enumeration value="home"/>
    <xs:enumeration value="DSN"/>
    <xs:enumeration value="mobile"/>
    <xs:enumeration value="fax"/>
    <xs:enumeration value="skype"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="phoneTypeUnion">
  <xs:union memberTypes="phoneTypeEnumerations xs:string"/>
</xs:simpleType>

<xs:simpleType name="pocRoleEnumerations">
  <xs:restriction base="xs:string">
    <xs:enumeration value="primary author"/>
    <xs:enumeration value="contributor"/>
    <xs:enumeration value="publisher"/>
    <xs:enumeration value="proponent"/>
    <xs:enumeration value="sponsor"/>
    <xs:enumeration value="release authority"/>
    <xs:enumeration value="IP holder"/>
    <xs:enumeration value="copyright holder"/>
    <xs:enumeration value="technical POC"/>
    <xs:enumeration value="ADS-Designator"/>
    <xs:enumeration value="unspecified"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="pocRoleUnion">
  <xs:union memberTypes="pocRoleEnumerations xs:string"/>
</xs:simpleType>

<xs:simpleType name="ratingEnumerations">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Poor"/>
    <xs:enumeration value="Fair"/>
    <xs:enumeration value="Average"/>
    <xs:enumeration value="Good"/>
    <xs:enumeration value="Excellent"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="ratingUnion">
  <xs:union memberTypes="ratingEnumerations xs:string"/>
</xs:simpleType>

<xs:simpleType name="relatedDirectionTypeEnumerations">
  <xs:restriction base="xs:string">
    <xs:enumeration value="inbound"/>
    <xs:enumeration value="outbound"/>
    <xs:enumeration value="bidirectional"/>
  </xs:restriction>
</xs:simpleType>

<!-- Used to indicate that the relationship direction is from the related resource to the resource described in the
instant DDMS record -->

<!-- Used to indicate that the relationship direction is from the resource described in the instant DDMS record to the
related resource identified -->

<!-- Used to indicate that the relationship is bidirectional between the resource described in the instant DDMS
record and the related resource identified -->

<!-- x:s:enumeration value="is-described-by" -->
DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS)

<x:union memberTypes="relatedDirectionTypeEnumerations xs:string"/>
</xs:simpleType>
<x:simpleType name="releasabilityValueEnumerations">
  <x:restriction base="xs:string">
    <x:enumeration value="A: Unlimited distribution"/>
    <x:enumeration value="B: U.S. Govt. agencies only"/>
    <x:enumeration value="C: U.S. Govt. agencies and contractors only"/>
    <x:enumeration value="D: DoD and DoD contractors only"/>
    <x:enumeration value="E: DoD components only"/>
    <x:enumeration value="F: As directed by DoD originator"/>
    <x:enumeration value="X: Those eligible to obtain export-controlled technical data"/>
  </x:restriction>
</xs:simpleType>
<x:simpleType name="releasabilityValueUnion">
  <x:union memberTypes="releasabilityValueEnumerations xs:string"/>
</xs:simpleType>
<!--Version 1.4 update - pick list added to reflect suffix of person w/ name component-->
<x:simpleType name="suffixValueEnumerations">
  <x:restriction base="xs:string">
    <x:enumeration value="I"/>
    <x:enumeration value="II"/>
    <x:enumeration value="III"/>
    <x:enumeration value="IV"/>
    <x:enumeration value="V"/>
    <x:enumeration value="VI"/>
    <x:enumeration value="Jr."/>
    <x:enumeration value="Sr."/>
  </x:restriction>
</xs:simpleType>
<x:simpleType name="suffixValueUnion">
  <x:union memberTypes="suffixValueEnumerations xs:string"/>
</xs:simpleType>
<x:simpleType name="supportAssetTypeEnumerations">
  <x:restriction base="xs:string">
    <x:enumeration value="infrastructure"/>
    <x:enumeration value="supported_events"/>
    <x:enumeration value="future_capabilities_requirements"/>
    <x:enumeration value="related_documents"/>
    <x:enumeration value="environment"/>
    <x:enumeration value="subject_matter_expert"/>
  </x:restriction>
</xs:simpleType>
<!--Version 1.4 update - pick list added to reflect title of person w/ name component-->
<x:simpleType name="titleValueEnumerations">
  <x:restriction base="xs:string">
    <x:enumeration value="Dr."/>
    <x:enumeration value="Miss."/>
    <x:enumeration value="Mr."/>
    <x:enumeration value="Mrs."/>
    <x:enumeration value="Ms."/>
    <x:enumeration value="Prof."/>
  </x:restriction>
</xs:simpleType>
<x:simpleType name="titleValueUnion">
  <x:union memberTypes="titleValueEnumerations xs:string"/>
</xs:simpleType>
<!--Version 1.2 update - pick list updated to reflect style of titleValueEnumerations (underscores instead of spaces) -->
<!--Version 1.4 update - pick list updated to reflect singular values rather than plural and update of interface_model_specification AND resource_document from software_design_document-->
<x:simpleType name="typeValueEnumerations">
  <x:restriction base="xs:string">
    <x:enumeration value="software"/>
    <x:enumeration value="tool"/>
    <x:enumeration value="federation"/>
    <x:enumeration value="software_component"/>
    <x:enumeration value="service"/>
    <x:enumeration value="data"/>
    <x:enumeration value="data_model"/>
    <x:enumeration value="interface_model_specification"/>
    <x:enumeration value="resource_document"/>
  </x:restriction>
</xs:simpleType>
C.9 MSC-DMS-Multicard.xsd

<?xml version="1.0" encoding="UTF-8"?>
<!-- DoD Modeling and Simulation (M&S) Community of Interest (COI) Discovery Metadata Specification (MSC-DMS) -->
<!-- updated with XMLSpy v2008 rel. 2 sp2 (http://www.altova.com) by Paul Gustavson (SimVentures, Inc.) -->
<!-- edited with XMLSpy v2008 rel. 2 sp1 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<!-- version 1.5 - 7/9/2012 -->
<!-- version 1.4 - 12/20/2010 -->
<!-- version 1.3.1 - 3/22/2010 -->
<!-- version 1.3 - 2/17/2010 -->
<!-- version 1.2 - 5/21/2009 -->
<!-- version 1.1 - 8/27/2008 -->
<!-- version 1.0.1 - 1/7/2008 -->

xmlns:ms="http://metadata.dod.mil/mdr/ns/MSCDMS/1.5/" targetNamespace="http://metadata.dod.mil/mdr/ns/MSCDMS/1.5/">
  <xs:element name="Multicard"
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Title" type="titleGenericType" minOccurs="0" />
        <xs:element name="Description" type="descriptionGenericType" minOccurs="0" />
        <xs:element name="Metadata" type="MetadataType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="Resource" type="resourceType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="Contact" type="contactType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="Taxonomy" type="taxonomyType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="WorkFlow" type="workflowType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="Releaseability" type="releasabilityType" minOccurs="0" />
        <xs:element name="Security" type="securityType" minOccurs="0" />
        <xs:any namespace="#other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>

CHANGE LOG:
7/9/2012 - updated to incorporate adjudicated 2012 Change Requests (CRs) for version 1.5
12/20/2010 - Updated to support version 1.4 (supports Resources, Contacts, and Taxonomy Classifications)
3/22/2010 - Updated to support version 1.3.1
2/17/2010 - Updated to support version 1.3
4/30/2009 - New schema allowing multiple Resource elements
Appendix D - References

Several specifications, documents, and technical references provide the technical foundation for the MSC Discovery Metadata characteristics and structure defined in this specification. As such, this specification should be used in conjunction with the publications and resources listed in Table D-1. If any of the specifications identified in Table D-1 are superseded by an approved revision, then the revision shall apply.

Table D-1 Reference Documents and Resources

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>DAMSMP</td>
<td>Department of Defense Acquisition Modeling and Simulation Master Plan, April 17, 2006</td>
</tr>
<tr>
<td>DoDI 5000.61</td>
<td>“DoD Modeling and Simulation (M&amp;S) Verification, Validation, and Accreditation (V&amp;V),” December 9, 2009</td>
</tr>
<tr>
<td>DoN M&amp;S VVA Handbook</td>
<td>DON M&amp;S VVA Implementation Handbook</td>
</tr>
<tr>
<td>IEEE Std 1516.3-2003</td>
<td>IEEE Recommended Practice for High Level Architecture (HLA) Federation Development and Execution Process (FEDEP)</td>
</tr>
</tbody>
</table>
Additional resources referenced in this document, which are referenced by a footnote identifier, are provided below:

i http://www.dod.mil/cio-nii/coi
iv Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), VERSION 3, 7 January 2010
vi Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), VERSION 3, 7 January 2010
vii Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
viii Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
x The Institute of Electrical and Electronics Engineers. IEEE P1730/ Dv 5.0 Draft Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP), July 2010
xv Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xvi Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xvii Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xviii Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xviii Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xx The Institute of Electrical and Electronics Engineers. IEEE P1730/ Dv 5.0 Draft Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP), July 2010
xxiv Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xxvi Department of Defense, Department of Defense Discovery Metadata Specification (DDMS), Version 3, 7 January 2010
xxvii The Institute of Electrical and Electronics Engineers. IEEE P1730/ Dv 5.0 Draft Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP), July 2010
xxviii The Institute of Electrical and Electronics Engineers. IEEE P1730/ Dv 5.0 Draft Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP), July 2010