



ISO/IEC JTC1/SC7  
Software Engineering  
Secretariat: CANADA (SCC)

**ISO/IEC JTC1/SC7 N1546**  
**July 14, 1996**

**DOC TYPE:** Combined WD, CD Registration and CD Ballot

**TITLE:** WD 15476-2: Information Technology - Software Engineering Data Definition and Interchange - Integrated Meta-model  
Part 2 : Common Subject Area

**SOURCE:** WG11

**PROJECT:** 07.28.3.5

**STATUS:** WD

**REFERENCES:** Resolution 449, SC7 N1539

**ACTION ID:** ACT

**DUE DATE:** 1996-10-28. It would be most appreciated that a copy of the comments, if any, be send to the project 07.28 editor, Mr Jean Bérubé (jberube@ibm.net) before 1996-10-18.  
PLEASE RETURN THE TWO BALLOTS.

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**MEDIUM:** E-Mail - uuencoded compressed Word ; Diskette - compressed Word

**NO. OF PAGES:** 94 [ 249 kB]

**DISK NUMBER:** 8



ISO/IEC JTC1/SC7  
Software Engineering  
Secretariat: CANADA (SCC)

## LETTER BALLOT

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### PROPOSAL:

That document SC7 N1546 *Information Technology - Software Engineering Data Definition and Interchange - Integrated Meta-model Part 2 : Common Subject Area* be registered as a Committee Draft (CD).

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This letter ballot is to be returned by each "P" National Body to the JTC 1/SC 7 Secretariat no later than **1996-10-28**.

\* We approve the proposal as presented

OR

\* We approve the proposal with the attached comments

OR

\* We disapprove the proposal for the attached technical reasons

OR

\* We abstain from voting (P-members have an obligation to vote)

National Body: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

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\* Delete whichever does not apply.



<b>ISO/IEC JTC1/SC7 CD 15476-2</b>	
Date <b>1996-07-14</b>	Reference number <b>ISO/JTC 1/SC 7 N 1546</b>
Supersedes document N/A	

THIS DOCUMENT IS STILL UNDER STUDY AND SUBJECT TO CHANGE. IT SHOULD NOT BE USED FOR REFERENCE PURPOSES.

ISO/JTC 1/SC 7 Committee Title <b>Software Engineering</b> Secretariat: Standards Council of Canada (SCC)	Circulated to P- and O-members, and to technical committees and organizations in liaison for: X discussion at Ottawa on 1996-10-21 X comment by 1996-10-21 X voting by (P-members only)  <b>1996-10-28</b>  Please return all votes and comments in electronic form directly to the SC 7 Secretariat by the due date indicated.
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ISO/IEC JTC1/SC7

Title: Information Technology - Software Engineering Data Definition and Interchange - Integrated Meta-model Part 2 : Common Subject Area

Project: 07.28.3.5

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Introductory note: See Attachements

Medium: E-Mail - uuencoded compressed Word ; Diskette - compressed Word

No. of pages: 94

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<b>Vote on Committee Draft ISO/IEC 15476-2</b>	
Date of circulation <b>1996-07-14</b>	Reference number <b>ISO/JTC 1/SC 7 N 1546</b>
Closing date <b>1996-10-28</b>	

ISO/JTC 1/SC 7 Committee Title <b>Software Engineering</b> Secretariat: Standards Council of Canada (SCC)	Circulated to P-members of the committee for voting  Please return all votes and comments in electronic form directly to the SC 7 Secretariat by the due date indicated.
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ISO/IEC JTC1/SC7

Title: Information Technology - Software Engineering Data Definition and Interchange - Integrated Meta-model Part 2 : Common Subject Area

Project: 07.28.3.5

**Vote:**

- APPROVAL OF THE DRAFT AS PRESENTED
- APPROVAL OF THE DRAFT WITH COMMENTS AS GIVEN ON THE ATTACHED
- general:
- technical:
- editorial:
- DISAPPROVAL OF THE DRAFT FOR REASONS ON THE ATTACHED
- Acceptance of these reasons and appropriate changes in the text will change our vote to approval
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Date:  
1996-MM-DD

Submitted by:  
Name



**SC7**

**N1546**

ISO IEC WD 15476-2  
EIA/IS-112  
SC7 WG11 N049

**Information Technology - Software Engineering Data  
Definition and Interchange - Integrated Meta-model  
Part 2 : Common Subject Area**

<b>Author:</b>	EIA CDIF	<b>Source:</b>	SC7 WG11
<b>Project:</b>	7.28.3.5	<b>Date:</b>	1996.05.31
<b>Action:</b>	Circulation to JTC1 SC7 For WD Circulation, CD Registration Ballot, CD Ballot, CD Review and Comments	<b>Status:</b>	Working Draft
<b>Reference:</b>	SC7 N1220      Resolution #343 Ottawa Plenary (94.06.17) SC7 N 1538      Resolution #459 Prague Plenary (96.05.31)		

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## Introduction

ISO/IEC JTC1 SC7 WG11, in its Project 07.28, has the objective of enabling the interchange of information between a variety of heterogeneous software engineering tools.

Many of the input documents for Project 07.28 are the result of developmental work performed by the CASE Data Interchange Format (CDIF) technical committee of the Electronics Industries Association (EIA). This is one of those documents, and is distributed as received from the CDIF editor.

At its Brisbane meeting, in June 95, SC7 approved the distribution of the committee drafts.

This document is intended to provide one part within the multipart standard resulting from Project 7.28. Documents will be reformatted to ISO Directives as part of the Committee Draft ballot and comment resolution.

## Comments

Comments are requested within the timetable provided by the SC7 cover sheet (generally 100 days) to facilitate preparation for the next WG11 meeting. Comments should be sent by normal formal channels.

To facilitate planning and preparatory resolution proposals, WG11 would appreciate comments to be submitted to the WWW ([www.cdif.org/comments.html](http://www.cdif.org/comments.html)) site identified for that purpose).

Comments are to be provided in electronic format, generally following the format used for the WWW page. If comments are also submitted on paper, they should use a similar format.

Please identify clearly the status of comments submitted, such as:

National Body Comments,  
National Body Approved Expert Comments.

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711PRA-11  
Explanatory Notes for SC7 Reviewers  
of the  
WG11-CDIF Documents  
(Project 07.28)

- The “Overview” document (WG11 N047R1, SC7 N1540) should be read first since it describes all the other project 7.28 CD documents to be reviewed at this time (as well as several documents planned for the future). It also describes the overall architecture that applies to these documents.
- The “Framework” document (WG11 N046R1, SC7 N1541) should be read second, as it describes the entity-relationship-attribute modeling notation that is used in many of the documents.
- The “Data Modeling” document (WG11 N036, SC7 N1548) and the “Data Flow Modeling” (WG11 N035, SC7 N1549) document provide the substantive coverage of software engineering techniques within the first set of documents. These documents permit the structured representation of software designs prepared by the use of any of a number of well established software engineering techniques that produce what are commonly called data flow diagrams and/or entity-relationship- attribute diagrams. These two documents will be of the greatest interest to software engineering practitioners.
- The “Foundation”, “Common”, and “Data Definition” documents (WG11 N048R1, N049, N050 and respectively SC7 N1545, N1546, 1547) are “modeling infrastructure” documents that support the contents of the software engineering techniques document, Data Modeling and Data Flow Modeling. Elements in these three infrastructure documents are incorporated by reference into the technique documents as necessary.
- The Transfer Format documents, “General Rules”, “Syntax”, and “Encoding” (WG11 N040R1, N041R1, N042R1 and respectively SC7 N1542, N1543, N1544) describe how character sequences are formed in order to communicate software design representations. These may be read separately from the technique and infrastructure documents described above.
- Of special importance for this review is the “Foundation” document (WG11 N048R1, SC7 N1545). This document illustrates the format intended to be applied to all the documents in this set for subsequent balloting. WG11 specifically solicits reviewer comments related to the format of this document so that the reformatting effort for the other documents in this set need be done only once.

WG11 will greatly appreciate the national body review comments on these documents, and thanks in advance the reviewers for their efforts. Any early submissions of comments will be very helpful.

In order to fully ensure that all comments received are processed efficiently and consistently, WG11 requests of all reviewers to please utilize the comments template that is provided with each document. Submitting comments in electronic form rather than on paper will be especially helpful.

If assistance with the usage of the comment forms is required, or if there are any other questions, please contact either Jean Berube, the Project 7.28 coordinating editor, or myself.

Sincerely,

Peter Eirich  
WG11 Convenor

1 **1. SCOPE**

2 The CDIF Family of Standards is primarily designed to be used as a description of a mechanism  
3 for transferring information between CASE tools. It facilitates a successful transfer when the  
4 authors of the importing and exporting tools have nothing in common except an agreement to  
5 conform to CDIF. The language that is defined for the Transfer Format also has applicability as a  
6 general language for Import/Export from repositories. The CDIF Integrated Meta-model defined  
7 for CASE also has applicability as the basis of standard definitions for use in repositories.

8 The standards that form the complete family of CDIF Standards are documented in *EIA/IS-106*  
9 *CDIF - CASE Data Interchange Format - Overview*. These standards cover the overall  
10 framework, the transfer format and the CDIF Integrated Meta-model.

11  
12 **Error! Not a valid filename.**

13 Figure 1  
14 Position in the CDIF Family of Standards

15 The diagram in Figure 1 depicts the various standards that comprise the CDIF Family of  
16 Standards. The shaded box depicts this Standard and its position in the CDIF Family of  
17 Standards.

18 This standard defines the Common Subject Area of the CDIF Integrated Meta-model. This subject  
19 area contains meta-objects that are used as the basis of the other subject area standards, and also  
20 meta-relationships and meta-attributes that are applicable to all meta-objects.

## 2. INTRODUCTION

### 2.1 Audience

This document is intended to be used by anyone wishing to understand and/or use CDIF. This document provides a definition of a single subject area of the CDIF Integrated Meta-model. It is suitable for:

- those evaluating CDIF
- those who wish to understand the principles and concepts of a CDIF transfer
- those developing importers and exporters.

**CDIF - CASE Data Interchange Format - Overview (ISO CD 15474-1: Information Technology - Software Engineering Data Definition and Interchange - Overview and Framework: Part 1 : Overview) and CDIF - Framework for Modeling and Extensibility (ISO CD 15474-2: Information Technology - Software Engineering Data Definition and Interchange - Overview and Framework: Part 2 : Framework for Modeling and Extensibility) should be read first when initially exploring the CDIF family of standards.**

While there are no specific prerequisites for reading this document, it will be helpful for the reader to have familiarity with the following:

- Entity-Relationship-Attribute modeling
- CASE tools
- Information repositories
- Data dictionaries
- Multiple meta-layer modeling.

### 2.2 Structure of this Document

This document is organized into the following sections:

#### **Section 1 'Scope'**

This describes the CDIF Family of Standards and positions the current document within the set of documents.

#### **Section 2 'Introduction'**

This describes the intended audience, structure and conventions used in the document.

1 **Section 3 'Structure of Subject Area Definition'**

2 This describes in detail the structure of the subsequent sections of this standard including  
3 the notation and layout of the diagrams and the detailed definitions.

4 **Section 4 'Subject Area Overview'**

5 This gives an overview of the coverage of this subject area.

6 **Section 5 'Subject Area Detailed Definitions'**

7 This gives the detailed definitions of all the objects used in the subject area.

8 **Section 6 'Referenced Meta-object Definitions'**

9 This gives the detailed definitions of objects that are not used in the subject area defined in  
10 this Standard, but are referenced by objects that are. These definitions are included to  
11 avoid the need to reference multiple standards to obtain the complete definition of the  
12 current subject area.

13 **Appendix A 'Questions and Answers'**

14 This includes detailed responses to questions that have been raised by those reviewing this  
15 document. It is intended that the inclusion of these will aid the reader in understanding  
16 this document, and related issues concerning CDIF.

17 **Glossary**

18 The Glossary contains definitions of terms used within this Standard.

19 **References**

20 The References section contains references to other standards and documents used within  
21 this Standard.

22 **Index**

23 A comprehensive index is provided.

## 2.3 Conventions

The typographical and naming conventions defined below are used throughout the CDIF Family of Standards.

- Double quotes are used to introduce new terms (e.g., "model layer")
- Bold type is used for emphasis (e.g., this is **important**)
- All meta-objects and meta-meta-objects in CDIF (in meta-models and meta-meta-models) are named by concatenating all the words that name the meta-object or meta-meta-object; the first letter of each word is upper-case, the rest are lower-case. These names are shown in italic (e.g., *MetaAttribute*, *AttributeDerivation*, *IsDrawnUsing*, *IsOptional*)
- The names of objects and values for meta-attributes that appear in examples and instance diagrams are shown in bold italic (e.g., ***Customer***, ***TRUE***, ***100***)

Full details of the CDIF Graphical Notation used in the Meta-model and Meta-meta-model can be found in *EIA/IS-107 CDIF - Framework for Modeling and Extensibility*. A summary of the major concepts is given in Section 3.2.3, Diagram(s).

## 3. STRUCTURE OF SUBJECT AREA DEFINITION

### 3.1 Introduction

The following subsections describe how the subject area is defined in the remainder of this document. The subject area is first introduced in the Subject Area Overview Section, and the detailed definitions of the objects contained in the subject area are given in the Subject Area Definitions Section.

### 3.2 Structure of Subject Area Overview

#### 3.2.1 Summary

The Subject Area Overview Section consists of the following sub-sections:

- Description of Major Concepts
- Diagram(s)
- AttributableMetaObject Hierarchy
- MetaEntity Summary
- MetaRelationship Summary

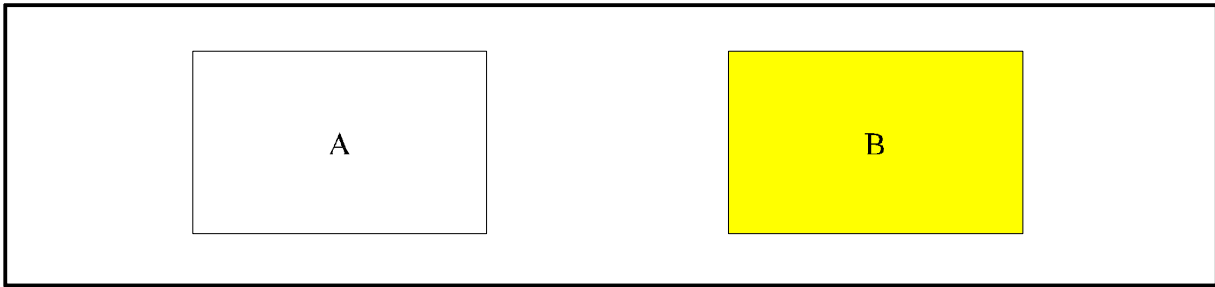
#### 3.2.2 Description of Major Concepts

This provides a textual description of the major concepts in the subject area. It explains the coverage of this subject area and outlines what it is capable of representing.

#### 3.2.3 Diagram(s)

Included in the Subject Area Overview is one meta-model diagram. This diagram is intended to present graphically an overview of the meta-entities and meta-relationships used in this subject area. All CDIF subject area diagrams use the following diagramming notation conventions.

Meta-entities used in the subject area are shown as rectangular boxes, with the name of the meta-entity on a white background. An example is the meta-entity *A* in Figure 2. An additional special notation may be used to represent meta-entities on diagrams of meta-models. If the meta-entity is not used in the subject area, but is used in another subject area and is included for clarity, the box shall be shaded. An example is the meta-entity *B* in Figure 2.

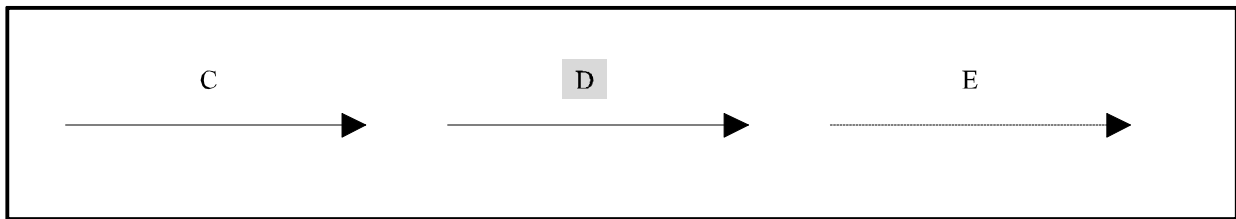


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Figure 2  
Conventions for Representing Meta-entities

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Meta-relationships are normally represented by a line joining the source and destination entities, with the name of the meta-relationship given next to the line. An arrow on the line indicates the direction in which to read the name. The meta-relationship *C* in Figure 3 is an example of this. Additionally, two special notations may be used to represent meta-relationships on diagrams of meta-models.

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If a meta-relationship is included in the diagram for clarification, but it is not used in the subject area, the text of the meta-relationship name shall be back-shaded. This is shown for the meta-relationship *D* in Figure 3.

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If a supertype meta-entity that participates in a meta-relationship is not included in the diagram, the inherited meta-relationship shall be shown on the diagram as a broken line to/from the inheriting subtype meta-entity. This is shown for the meta-relationship *E* in Figure 3.



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Figure 3  
Conventions for Representing Meta-relationships

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Full details of the CDIF Graphical Notation used in the Meta-model and the Meta-meta-model can be found in *EIA/IS-107 CDIF - Framework for Modeling and Extensibility*.

### 3.2.4 AttributableMetaObject Hierarchy

The AttributableMetaObject Hierarchy in the Subject Area Overview section contains all the meta-entities and meta-relationships used in the subject area. It also identifies all supertypes required to relate the meta-objects used back to *RootObject*. Other subtypes of objects shown in the hierarchy, where neither they nor any of their subtypes are used in this subject area, are not shown.

The AttributableMetaObject Hierarchy is presented as an indented list of meta-object names. The indentation indicates the subtyping; all names indented below a given name are subtypes of that meta-object. For example, if *Car* and *Truck* are both subtypes of *Vehicle*, this would be shown as follows:

```
Vehicle
  Car
  Truck
```

A meta-entity or meta-relationship and all its subtypes can be duplicated in the hierarchy due to multiple inheritance. Where this occurs, the duplicate entries are shown in *italics*.

The overall AttributableMetaObject supertype, *RootObject*, defined in *EIA/IS-111 CDIF - Integrated Meta-model - Foundation Subject Area*, is shown at the top of the hierarchy.

### 3.2.5 MetaEntity and MetaRelationship Summaries

Summaries are given of all the meta-entities and meta-relationships used in the Subject Area. The meta-entity definitions are given first, in alphabetical order, followed by the meta-relationship definitions, also in alphabetical order.

For each meta-entity used in the subject area, all the meta-attributes, both inherited and local, are listed. The inherited meta-attributes are shown first, in italics, sequenced alphabetically within parent meta-entity. The local meta-attributes are then listed alphabetically in normal font. The optionality, whether mandatory or optional, of each meta-attribute is given.

For each meta-relationship all the meta-attributes are listed sequenced alphabetically. Inherited and local meta-attributes are shown in the same way as for meta-entities. The optionality of each meta-attribute is given.

### 3.3 Structure of Subject Area Detailed Definitions

#### 3.3.1 Summary

The Subject Area Detailed Definitions section consists of the following sub-sections:

- Subject Area Definition
- MetaEntity Definitions
- MetaRelationship Definitions

#### 3.3.2 Subject Area Definition

This is the formal definition of the instance of the meta-entity called *SubjectArea* (SA). It contains the information listed in Table 1.

Table 1  
Contents of Subject Area Definition

<b>5.2 Subject Area Definition</b>
NAME..... <b>subject area name</b>
CDIFMETAIDENTIFIER.....
DESCRIPTION .....
USAGE.....
ALIASES.....
CONSTRAINTS .....
VERSIONNUMBER.....

#### 3.3.3 MetaEntity Definitions

The definition of each meta-entity used in the subject area is structured according to the classes of information listed in Table 2.

For each meta-entity:

- Inherited meta-attributes are listed by supertype meta-entity in a top-down hierarchical order. Within each sub-list, meta-attributes are listed alphabetically.
- Inherited meta-relationships are grouped by source meta-entity (listed in alphabetical order). Within each group, the inherited meta-relationships are sorted alphabetically by "verb" name and then alphabetically by destination meta-entity name. Inherited abstract meta-relationships are not listed.
- Local meta-attributes are listed alphabetically
- Detailed local meta-attribute descriptions are listed alphabetically.

Table 2  
 Contents of Meta-entity Definition

3	<b>5.N.N</b>	<b>Meta-entity Name</b>	
4	NAME	<b>meta-entity name</b>	
5	CDIFMETAIDENTIFIER		
6	SUBTYPEOF	List of direct supertypes of the meta-entity...	
7		meta-entity name	[not] in this SA
8	SUPERTYPEOF.....	List of direct subtypes of the meta-entity within this	
9		subject area...	
10		meta-entity name	
11	DESCRIPTION .....		
12	USAGE.....		
13	ALIASES.....		
14	CONSTRAINTS .....		
15	TYPE .....		
16	<hr/>		
17	<b>INHERITED META-ATTRIBUTES</b>		
18		List of meta-attributes inherited from all supertypes of the meta-entity, with the	
19		name of the meta-object for which the meta-attribute is defined...	
20		meta-attribute name	from meta-entity name [not] in this SA
21	<hr/>		
22	<b>LOCAL META-ATTRIBUTES</b>		
23		List of meta-attributes defined for the meta-entity...	
24		meta-attribute name	
25	<hr/>		
26	<b>INHERITED META-RELATIONSHIPS</b>		
27		List of instantiable meta-relationships inherited from all supertypes of the	
28		meta-entity...	
29		meta-relationship name	[not] in this SA
30	<hr/>		
31	<b>LOCAL META-RELATIONSHIPS</b>		
32		List of meta-relationships defined for the meta-entity...	
33		meta-relationship name	
34	<hr/>		
35	Full definitions of all local meta-attributes appear at this point. See Table 3 for format		
36	of local meta-attribute definitions.		
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Table 3  
Contents of Local Meta-attribute Definition

META-ATTRIBUTE NAME..... <b>meta-attribute name</b>
CDIFMETAIDENTIFIER.....
DESCRIPTION .....
USAGE.....
ALIASES.....
CONSTRAINTS .....
DATA TYPE.....
DOMAIN .....
LENGTH .....
ISOPTIONAL.....

### 3.3.4 MetaRelationship Definitions

The definition of each meta-relationship used in the subject area is structured according to the classes of information listed in Table 4.

For each meta-relationship:

- Inherited meta-attributes are listed by supertype meta-relationship in a top-down hierarchical order. Within each sub-list, meta-attributes are listed alphabetically
- Local meta-attributes are listed alphabetically
- Detailed local meta-attribute descriptions are listed alphabetically.

Table 4  
 Contents of Meta-relationship Definition

<b>5.N.N</b>	<b>Full Meta-relationship Name</b>	
NAME	<b>meta-relationship name</b>	
CDIFMETAIDENTIFIER		
SUBTYPEOF	List of direct supertypes of the meta-relationship... meta-relationship name [not] in this SA	
SUPERTYPEOF	List of direct subtypes of the meta-relationship within this subject area... meta-relationship name	
MINSOURCECARD .....	Minimum source meta-entity cardinality	
MAXSOURCECARD .....	Maximum source meta-entity cardinality	
MINDESTCARD .....	Minimum destination meta-entity cardinality	
MAXDESTCARD .....	Maximum destination meta-entity cardinality	
DESCRIPTION .....		
USAGE .....		
ALIASES .....		
CONSTRAINTS .....		
<hr/>		
<b>INHERITED META-ATTRIBUTES</b>		
List of meta-attributes inherited from all supertypes of the meta-relationship, with the name of the meta-object for which the meta-attribute is defined...		
	meta-attribute name	from meta-relationship name [not] in this SA
<hr/>		
<b>LOCAL META-ATTRIBUTES</b>		
List of meta-attributes defined for the meta-relationship...		
	meta-attribute name	
<hr/>		
Full definitions of all local meta-attributes appear at this point. See Table 3 for format of local meta-attribute definitions.		

### 3.4 Structure of Referenced Meta-object Definitions

This section contains the formal definitions of meta-objects referenced by the definitions of meta-objects used in the subject area. These will include the *AttributableMetaObject RootObject*, since this is the root of the *AttributableMetaObject* Hierarchy, and it may also include other meta-entities and meta-relationships.

1 The definitions are given in the following order: *AttributableMetaObject*, meta-entities, then  
2 meta-relationships. Within each section, they are listed in alphabetical order. The definition  
3 layout for the *AttributableMetaObject* is the same as that of the meta-entity; both meta-entity and  
4 meta-relationship definitions follow the same layout as that defined for the Subject Area Detailed  
5 Definitions section.

## 4. SUBJECT AREA OVERVIEW

### 4.1 Description of Major Concepts

#### 4.1.1 Introduction

The Common Subject Area is intended to cover concepts such as synonyms, decomposition, and audit data, that are common or useful to all of the CDIF Integrated Meta-model. The Common Subject Area covers aspects required for all objects described in a CDIF Transfer. Concepts defined here include alternate names, details of the tool user who created or updated any object, and constraints on objects.

#### 4.1.2 Classification

The CDIF Integrated Meta-model is hierarchical in nature. The top of the Integrated Meta-model is *RootEntity*. *RootEntity* establishes a set of common meta-attributes and meta-relationships to be inherited by all meta-objects. *RootEntity* is an abstract supertype that should not be instantiated and shall not have any supertypes defined.

There are two main subtypes defined for *RootEntity* - *SemanticInformationObject* and *PresentationInformationObject*. The other subtypes are *AbstractionLevel*, *AlternateName*, *TextualConstraint*, and *ToolUser*. These are all described in the following sub-sections.

#### 4.1.3 Semantic Information

*SemanticInformationObject* is the supertype of all meta-entities defined within the semantic information portion of the CDIF Integrated Meta-model. These describe model objects (e.g., objects in a general business model). All meta-entities that convey semantic information, defined in the set of standards forming the CDIF Integrated Meta-model, other than *RootEntity* and *SemanticInformationObject*, are defined as either direct or indirect subtypes of *SemanticInformationObject*.

The meta-entity *SemanticInformationObject* is given local meta-attributes of *BriefDescription* and *FullDescription*.

In this Subject Area, *SemanticInformationObject* has three subtypes: *DataObject*, *ProcessObject*, and *Derivation*.

## 4.1.4 Presentation Information

*PresentationInformationObject* is the supertype for all the meta-entities defined within the presentation information portion of the CDIF Integrated Meta-model. These contain the graphical information about the associated semantic models. For example, the location and shape of an object in the semantic model.

## 4.1.5 Naming

The concept of a "Name" for an object varies considerably from method to method and object to object. In some cases, an object can have a short name, a long name and alternates or synonyms for each. In other cases, no distinct name is required. Due to these differences, no *Name* meta-attributes have been provided at a high level in the *AttributableMetaObject* Hierarchy to be automatically inherited. Name meta-attributes have been added specifically as required. These meta-attributes have been called *Name* and *LongName* when used.

Often objects can be given alternate names, or synonyms. These are optional, and there may be more than one provided. To cater for this in a standard manner, an *AlternateName* meta-entity has been provided which can be related to any instance of *RootEntity* and its other subtypes, except *AlternateName*. This provides a simple way of defining such alternates, but it shall only be used where either *Name*, *LongName*, or both, are provided as meta-attributes of the meta-entity to which it is related. Alternatives for *Name* and *LongName* are recorded in the *OtherName* and *OtherLongName* meta-attributes of *AlternateName*, respectively. *AlternateName* shall not be used to provide a name for an object where no *Name* or *LongName* meta-attribute has been provided since a name is only **alternate** where there is one already defined. When it is necessary to add a name to an unnamed object, such naming should be done through the use of extensibility by adding an explicit *Name* meta-attribute.

Consider a data type called *CustomerNumber*; it may also be known by other names in the system being modeled, including *CustomerNo* and *CustNo*. These are synonyms for the same data type. The name *CustomerNumber* would be held in the *Name* meta-attribute of the instance of *DataType*. Each of the synonyms would be held in a separate instance of *AlternateName* in the *OtherName* meta-attribute. These two instances of *AlternateName* would be related to the instance of *DataType* by the meta-relationship *RootEntity.Has.AlternateName*. This set of meta-objects records that the data type has two synonyms.

1 Now consider how to record which synonym is being used in any particular context - this is where  
2 the meta-relationship *RootEntity.Uses.AlternateName* is required. The following example, where  
3 different organizations refer to vendors as either Vendors, Contractors, or Suppliers, shows how  
4 the CDIF Integrated Meta-model supports this concept. Assume that the part of a subject area  
5 dealing with contracts includes the *Organization* and *Resource* meta-entities and a meta-  
6 relationship called *Organization.Utilizes.Resource*. Assume, also, that the **Vendor** instance of  
7 *Resource* has two *AlternateNames*: **Supplier** and **Contractor**. If an organization, say  
8 Reprographics, uses the term **Vendor** to refer to those it relies on for service, this would be  
9 recorded with an instance of *Organization.Utilizes.Resource* from the **Reprographics** instance of  
10 *Organization* to the **Vendor** instance of *Resource*. If another organization, FoodServices, refers  
11 to the vendor for cafeteria operations as a **Supplier**, this would be recorded via an instance of  
12 *Organization.Utilizes.Resource* relating the **FoodServices** instance of *Organization* to the  
13 **Vendor** instance of *Resource*. But an instance of *RootEntity.Uses.AlternateName* between  
14 **FoodServices** and **Supplier** is used to indicate that the **Supplier** *AlternateName* is what  
15 FoodServices calls vendors. Figure 4 shows both the subject area fragment and a depiction of the  
16 instances discussed in this example.

17 **Error! Not a valid filename.**

18 Figure 4  
19 AlternateName Example

#### 20 **4.1.6 Audit Data**

21 The audit data supported by the Common Subject Area are the details of who created and  
22 updated any object. This is represented through meta-relationships from *RootEntity* to the  
23 *ToolUser* meta-entity.

#### 24 **4.1.7 Constraints**

25 The *TextualConstraint* meta-entity enables constraints to be attached to any semantic object or set  
26 of objects. The constraint is expressed in text, either in one of a set of computable languages or in  
27 some other formal or informal language. The supported set of languages is defined in Section  
28 4.1.11, Computable Languages.

#### 29 **4.1.8 Derivation**

30 Derivations between objects can be represented through use of the *Derivation* meta-entity, using  
31 the *UsedIn* and *ProducedBy* meta-relationships to associate the objects. The *Derivation* meta-  
32 entity can be used to describe a weak form of derivation, such as instances of *Entity* being derived  
33 from instances of *Store* on a *DataFlowModel*. Stronger forms of derivation can also be described,  
34 for example where one object is an implementation of another. The derivation is expressed in  
35 text, either in one of a set of computable languages or in some other formal or informal language.  
36 These are defined in Section 4.1.11, Computable Languages.

## 4.1.9 Abstraction Levels

The abstraction level at which any object is used or defined in a user model can be defined through the use of the meta-entity *AbstractionLevel*. The level of abstraction, for example **Conceptual**, **Logical** or **Physical**, is held in the *Name* meta-attribute of an instance of *AbstractionLevel*. All the meta-entities used at that level are then connected to it through the meta-relationship *SemanticInformationObject.IsCategorizedIn.AbstractionLevel*. A given meta-entity instance can be used in multiple abstraction levels; for example the same definition of Entity **Customer** may be valid at both a conceptual and logical level.

Where an object at a lower level of abstraction is a more concrete description or implementation of an object at a higher level of abstraction, this is recorded using the derivation mechanism described in Section 4.1.8, Derivation. The meta-attribute *IsRealizationOf* on the *Derivation* meta-entity indicates this form of derivation.

## 4.1.10 Data Object Content

The data content of a *DataObject* can be described by the use of the Data Definition Subject Area, defined in *EIA/IS-113 CDIF - Integrated Meta-model - Data Definition Subject Area*.

## 4.1.11 Computable Languages

Where meta-attributes may contain definitions of algorithmic processes, the languages that can be used to define the algorithms have been limited to a small set, covering the most appropriate ones for the problem domain. Any other language, either computable or natural, may be used, but the type of the language will not be specified unless extensibility has been used.

The set of allowable languages is defined in Table 5.

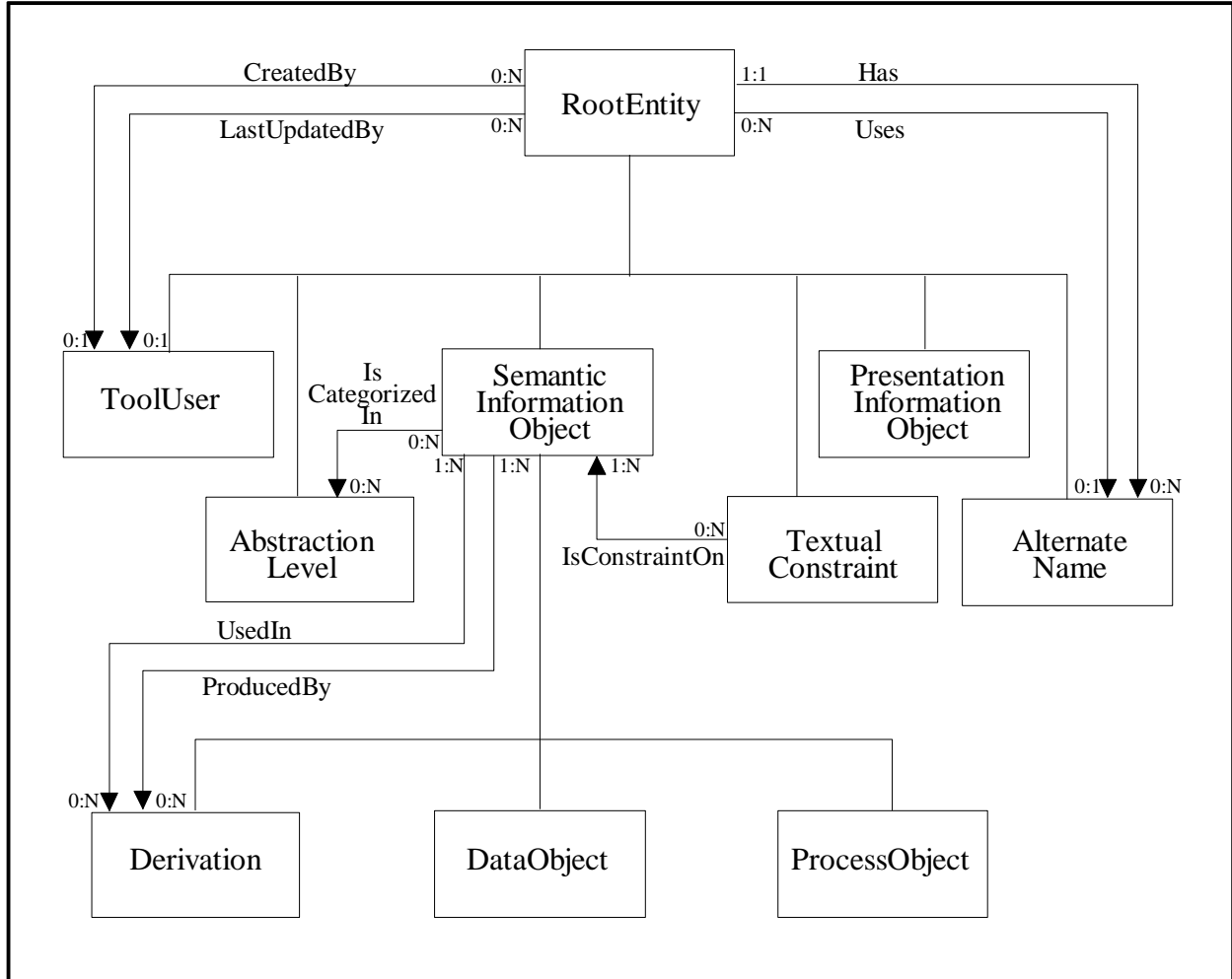
1  
2  
Table 5  
Allowable Values for Computable Languages and appropriate references

Ada	ANSI/MIL-STD-1815A, American National Standard for Information Systems - Reference Manual for the Ada <sup>®</sup> Programming Language
C	ISO/IEC 9899, International Standard for Programming Languages - C
COBOL	ISO 1989, International Standard - for information systems - programming language - COBOL
FORTTRAN	ISO 1539
MUMPS	ANSI/MDC X11.1
PASCAL	ANSI/IEEE 770/X8.97 and ANSI/IEEE 770/X8.160
PL1	ANSI X8.58
SQL	ISO/IEC 9075, Information Technology - Database Languages - SQL
Other	Any language other than those indicated by explicit values of the enumerated type.

3

1

## 4.2 Diagram



2

3

4

Figure 5  
Common Subject Area

### 4.3 AttributableMetaObject Hierarchy

MetaObjectName	Subject Area <sup>1</sup>
RootObject	not in this SA
RootEntity	in this SA
AbstractionLevel	in this SA
AlternateName	in this SA
PresentationInformationObject	in this SA
SemanticInformationObject	in this SA
DataObject	in this SA
Derivation	in this SA
ProcessObject	in this SA
TextualConstraint	in this SA
ToolUser	in this SA
RootEntity.IsRelatedTo.RootEntity	not in this SA
RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA
SemanticInformationObject.IsCategorizedIn.AbstractionLevel	in this SA
SemanticInformationObject.ProducedBy.Derivation	in this SA
SemanticInformationObject.UsedIn.Derivation	in this SA
TextualConstraint.IsConstraintOn.SemanticInformationObject	in this SA

---

<sup>1</sup>Those objects in this subject area are defined in Section 5; the others are defined in Section 6.

## 4.4 MetaEntity Summary

---

### MetaEntity Name

*Inherited MetaAttribute Name*

Local MetaAttribute Name                      Mandatory/Optional

---

### AbstractionLevel

*CDIFIdentifier*                                      *Mandatory*

*DateCreated*                                        *Optional*

*DateUpdated*                                       *Optional*

*TimeCreated*                                       *Optional*

*TimeUpdated*                                      *Optional*

Name     *Mandatory*

### AlternateName

*CDIFIdentifier*                                      *Mandatory*

*DateCreated*                                        *Optional*

*DateUpdated*                                       *Optional*

*TimeCreated*                                       *Optional*

*TimeUpdated*                                      *Optional*

OtherLongName                                   *Optional*

OtherName                                         *Optional*

### DataObject

*CDIFIdentifier*                                      *Mandatory*

*DateCreated*                                        *Optional*

*DateUpdated*                                       *Optional*

*TimeCreated*                                       *Optional*

*TimeUpdated*                                      *Optional*

*BriefDescription*                                *Optional*

*FullDescription*                                  *Optional*

Name     *Optional*

1	<b>Derivation</b>	
2	<i>CDIFIdentifier</i>	<i>Mandatory</i>
3	<i>DateCreated</i>	<i>Optional</i>
4	<i>DateUpdated</i>	<i>Optional</i>
5	<i>TimeCreated</i>	<i>Optional</i>
6	<i>TimeUpdated</i>	<i>Optional</i>
7	<i>BriefDescription</i>	<i>Optional</i>
8	<i>FullDescription</i>	<i>Optional</i>
9	DerivationLanguage	Optional
10	DerivationText	Optional
11	IsRealizationOf	Optional
12		
13	<b>PresentationInformationObject</b>	
14	<i>CDIFIdentifier</i>	<i>Mandatory</i>
15	<i>DateCreated</i>	<i>Optional</i>
16	<i>DateUpdated</i>	<i>Optional</i>
17	<i>TimeCreated</i>	<i>Optional</i>
18	<i>TimeUpdated</i>	<i>Optional</i>
19		
20	<b>ProcessObject</b>	
21	<i>CDIFIdentifier</i>	<i>Mandatory</i>
22	<i>DateCreated</i>	<i>Optional</i>
23	<i>DateUpdated</i>	<i>Optional</i>
24	<i>TimeCreated</i>	<i>Optional</i>
25	<i>TimeUpdated</i>	<i>Optional</i>
26	<i>BriefDescription</i>	<i>Optional</i>
27	<i>FullDescription</i>	<i>Optional</i>
28	ExecutionTimeInterval	Optional
29	ExecutionTimeUnit	Optional
30	Name	Optional
31	SpecificationLanguage	Optional
32	SpecificationText	Optional
33		
34	<b>RootEntity</b>	
35	CDIFIdentifier	Mandatory
36	DateCreated	Optional
37	DateUpdated	Optional
38	TimeCreated	Optional
39	TimeUpdated	Optional
40		

1	<b>SemanticInformationObject</b>	
2	<i>CDIFIdentifier</i>	<i>Mandatory</i>
3	<i>DateCreated</i>	<i>Optional</i>
4	<i>DateUpdated</i>	<i>Optional</i>
5	<i>TimeCreated</i>	<i>Optional</i>
6	<i>TimeUpdated</i>	<i>Optional</i>
7	BriefDescription	Optional
8	FullDescription	Optional
9		
10	<b>TextualConstraint</b>	
11	<i>CDIFIdentifier</i>	<i>Mandatory</i>
12	<i>DateCreated</i>	<i>Optional</i>
13	<i>DateUpdated</i>	<i>Optional</i>
14	<i>TimeCreated</i>	<i>Optional</i>
15	<i>TimeUpdated</i>	<i>Optional</i>
16	BriefDescription	Optional
17	ConstraintExpression	Optional
18	ConstraintLanguage	Optional
19	FullDescription	Optional
20		
21	<b>ToolUser</b>	
22	<i>CDIFIdentifier</i>	<i>Mandatory</i>
23	<i>DateCreated</i>	<i>Optional</i>
24	<i>DateUpdated</i>	<i>Optional</i>
25	<i>TimeCreated</i>	<i>Optional</i>
26	<i>TimeUpdated</i>	<i>Optional</i>
27	FullName	Optional
28	SystemName	Mandatory
29		

## 4.5 MetaRelationship Summary

---

### MetaRelationship Name

*Inherited MetaAttribute Name*

Local MetaAttribute Name                      Mandatory/Optional

---

### RootEntity.CreatedBy.ToolUser

<i>CDIFIdentifier</i>	<i>Mandatory</i>
<i>DateCreated</i>	<i>Optional</i>
<i>DateUpdated</i>	<i>Optional</i>
<i>TimeCreated</i>	<i>Optional</i>
<i>TimeUpdated</i>	<i>Optional</i>

### RootEntity.Has.AlternateName

<i>CDIFIdentifier</i>	<i>Mandatory</i>
<i>DateCreated</i>	<i>Optional</i>
<i>DateUpdated</i>	<i>Optional</i>
<i>TimeCreated</i>	<i>Optional</i>
<i>TimeUpdated</i>	<i>Optional</i>

### RootEntity.LastUpdatedBy.ToolUser

<i>CDIFIdentifier</i>	<i>Mandatory</i>
<i>DateCreated</i>	<i>Optional</i>
<i>DateUpdated</i>	<i>Optional</i>
<i>TimeCreated</i>	<i>Optional</i>
<i>TimeUpdated</i>	<i>Optional</i>

### RootEntity.Uses.AlternateName

<i>CDIFIdentifier</i>	<i>Mandatory</i>
<i>DateCreated</i>	<i>Optional</i>
<i>DateUpdated</i>	<i>Optional</i>
<i>TimeCreated</i>	<i>Optional</i>
<i>TimeUpdated</i>	<i>Optional</i>

1 **SemanticInformationObject.IsCategorizedIn.AbstractionLevel**

2	<i>CDIFIdentifier</i>	<i>Mandatory</i>
3	<i>DateCreated</i>	<i>Optional</i>
4	<i>DateUpdated</i>	<i>Optional</i>
5	<i>TimeCreated</i>	<i>Optional</i>
6	<i>TimeUpdated</i>	<i>Optional</i>

8 **SemanticInformationObject.ProducedBy.Derivation**

9	<i>CDIFIdentifier</i>	<i>Mandatory</i>
10	<i>DateCreated</i>	<i>Optional</i>
11	<i>DateUpdated</i>	<i>Optional</i>
12	<i>TimeCreated</i>	<i>Optional</i>
13	<i>TimeUpdated</i>	<i>Optional</i>

15 **SemanticInformationObject.UsedIn.Derivation**

16	<i>CDIFIdentifier</i>	<i>Mandatory</i>
17	<i>DateCreated</i>	<i>Optional</i>
18	<i>DateUpdated</i>	<i>Optional</i>
19	<i>TimeCreated</i>	<i>Optional</i>
20	<i>TimeUpdated</i>	<i>Optional</i>

22 **TextualConstraint.IsConstraintOn.SemanticInformationObject**

23	<i>CDIFIdentifier</i>	<i>Mandatory</i>
24	<i>DateCreated</i>	<i>Optional</i>
25	<i>DateUpdated</i>	<i>Optional</i>
26	<i>TimeCreated</i>	<i>Optional</i>
27	<i>TimeUpdated</i>	<i>Optional</i>

1     **5.     SUBJECT AREA DETAILED DEFINITIONS**

2     **5.1    Introduction**

3     This section provides the full definition of each object used in the Common Subject Area of the  
4     CDIF Integrated Meta-model.

5     The layout of the definitions in this Section is described in Section 3, Structure of Subject Area  
6     Definition.

1 **5.2 Subject Area Definition**

2 NAME.....**Common**

3 CDIFMETAIDENTIFIER ..... 11

4 DESCRIPTION.....The Common Subject Area is intended to cover aspects that are  
5 common or useful to all CASE objects.

6 USAGE.....It provides objects that are used as the basis of the remainder of the  
7 CDIF Integrated Meta-model. Some of the objects provided are  
8 generally useful as specific meta-entities and meta-relationships, such  
9 as *ToolUser*; others are useful as supertypes to be subtyped in other  
10 subject areas, such as *DataObject*.

11 ALIASES .....

12 CONSTRAINTS .....

13 VERSIONNUMBER.....01.00

---

---

15  
16

1 **5.3 Meta-entity Definitions**

2 **5.3.1 AbstractionLevel**

3 NAME.....**AbstractionLevel**  
 4 CDIFMETAIDENTIFIER ..... 12  
 5 SUBTYPEOF.....RootEntity in this SA  
 6 SUPERTYPEOF .....

7 DESCRIPTION.....A level of abstraction.  
 8 USAGE.....All objects defined in a level of abstraction are linked to the instance  
 9 of this meta-entity that names the level.

10  
 11 For example, a Conceptual Data Model would be related to an  
 12 instance of this meta-entity with a *Name* value of **Conceptual**. If the  
 13 tool models the abstraction levels of detailed objects within the data  
 14 model, these would also be related to the same instance of the meta-  
 15 entity *AbstractionLevel*. Where an object is used in more than one  
 16 abstraction level, the instance is related to more than one instance of  
 17 *AbstractionLevel*.

18 ALIASES .....

19 CONSTRAINTS.....

20 TYPE .....Kernel

---

22 INHERITED META-ATTRIBUTES

23	CDIFIdentifier	from RootObject	not in this SA
24	DateCreated	from RootObject	not in this SA
25	DateUpdated	from RootObject	not in this SA
26	TimeCreated	from RootObject	not in this SA
27	TimeUpdated	from RootObject	not in this SA

---

30 LOCAL META-ATTRIBUTES

31 Name

---

1 INHERITED META-RELATIONSHIPS

2	RootEntity.CreatedBy.ToolUser	in this SA
3	RootEntity.Has.AlternateName	in this SA
4	RootEntity.LastUpdatedBy.ToolUser	in this SA
5	RootEntity.Uses.AlternateName	in this SA

---

7 LOCAL META-RELATIONSHIPS

8 SemanticInformationObject.IsCategorizedIn.AbstractionLevel

---

---

11 META-ATTRIBUTE NAME.....**Name**

12 CDIFMETAIDENTIFIER ..... 13

14 DESCRIPTION..... The name of the abstraction level.

15 USAGE.....

16 ALIASES .....

17 CONSTRAINTS.....

18 DATATYPE..... Enumerated

19 DOMAIN..... Conceptual, Logical, Physical

20 LENGTH.....

21 ISOPTIONAL..... False

**5.3.2 AlternateName**

NAME.....**AlternateName**  
 CDIFMETAIDENTIFIER ..... 14  
 SUBTYPEOF.....RootEntity in this SA  
 SUPERTYPEOF .....

DESCRIPTION.....An alternate name for an object.  
 USAGE.....Where an object has more than one name, for example *Customer-Number* that is also known as *Cust-No* and *CUSTOMER-ID*, instances of *AlternateName* are used to hold all names except the first or primary name.

All the alternate names by which an object can be known should be connected to the object using the *RootEntity.Has.AlternateName* meta-relationship.

Where a different object refers to the object with the set of alternate names, and it is required to state which specific alternate name has been used, the other object is connected to the appropriate alternate name by an instance of the *RootEntity.Uses.AlternateName* meta-relationship. This is in addition to the relevant meta-relationship connecting the two objects.

ALIASES .....Alias, AlsoKnownAs, AKA, Synonym, Pseudonym

CONSTRAINTS.....At least one of the meta-attributes *OtherName* or *OtherLongName* shall have a value supplied.

TYPE .....Characteristic

INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

LOCAL META-ATTRIBUTES

OtherLongName  
 OtherName

1 INHERITED META-RELATIONSHIPS

2	RootEntity.CreatedBy.ToolUser	in this SA
3	RootEntity.Has.AlternateName	in this SA
4	RootEntity.LastUpdatedBy.ToolUser	in this SA
5	RootEntity.Uses.AlternateName	in this SA

---

7 LOCAL META-RELATIONSHIPS

8 RootEntity.Has.AlternateName  
9 RootEntity.Uses.AlternateName  
10  
11

---

12 META-ATTRIBUTE NAME..... **OtherLongName**

13 CDIFMETAIDENTIFIER ..... 15

14 DESCRIPTION..... An alternate long descriptive string by which the object may be  
15 known to the user.

16 USAGE..... This is used where a long descriptive name is required in addition to  
17 the *OtherName* meta-attribute.

18 ALIASES ..... FullName

19 CONSTRAINTS..... A value shall be supplied when no value is supplied for *OtherName*.

20 DATATYPE ..... String

21 DOMAIN .....

22 LENGTH..... 1024

23 ISOPTIONAL..... True  
24  
25

---

26 META-ATTRIBUTE NAME..... **OtherName**

27 CDIFMETAIDENTIFIER ..... 16

28 DESCRIPTION..... An alternate string by which the object is known to the user.

29 USAGE..... This is used for the meta-attribute that the end tool user expects to  
30 be used to name the object. This should be used where possible in  
31 preference to *OtherLongName*.

32 ALIASES ..... Label

33 CONSTRAINTS..... A value shall be supplied when no value is supplied for  
34 *OtherLongName*.

35 DATATYPE ..... String

36 DOMAIN .....

37 LENGTH..... 256

38 ISOPTIONAL..... True  
39  
40  
41

**5.3.3 DataObject**

NAME.....**DataObject**  
 CDIFMETAI DENTIFIER .....22  
 SUBTYPEOF.....SemanticInformationObject in this SA  
 SUPERTYPEOF .....

DESCRIPTION.....This object is used as a supertype for all meta-entities in the meta-model that are described using attributes, or contain attributes.

USAGE.....

ALIASES ..... View

CONSTRAINTS.....This meta-entity shall not be instantiated directly since all instances should be more precisely classified.

TYPE .....Kernel

INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA
BriefDescription	from SemanticInformationObject	in this SA
FullDescription	from SemanticInformationObject	in this SA

LOCAL META-ATTRIBUTES

Name

INHERITED META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA
SemanticInformationObject.IsCategorizedIn.AbstractionLevel	in this SA
SemanticInformationObject.ProducedBy.Derivation	in this SA
SemanticInformationObject.UsedIn.Derivation	in this SA
TextualConstraint.IsConstraintOn.SemanticInformationObject	in this SA

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LOCAL META-RELATIONSHIPS

---

---

META-ATTRIBUTE NAME.....**Name**  
CDIFMETAIDENTIFIER .....23  
DESCRIPTION.....This contains the name of the *DataObject*. The name establishes the  
identity of the *DataObject*.  
USAGE.....  
ALIASES .....  
CONSTRAINTS.....  
DATATYPE .....String  
DOMAIN .....  
LENGTH.....256  
ISOPTIONAL.....True

---

---

### 5.3.4 Derivation

NAME.....**Derivation**  
 CDIFMETAIDENTIFIER .....26  
 SUBTYPEOF.....SemanticInformationObject in this SA  
 SUPERTYPEOF .....

DESCRIPTION.....This links together a set of derived objects with the objects from which they are in some way derived. It may also define the derivation process itself.

USAGE.....This is used as a general derivation link. It can be used to describe a weak form of derivation, such as *Entities* being derived from *Stores* on a *DataFlowModel*. Stronger forms of derivation can also be described, for example where one object is an implementation of another. This can be used for relating objects defined in different *AbstractionLevels*.

ALIASES .....

CONSTRAINTS.....When multiple subject areas are being used, the other subject areas should be checked for the existence of subtypes of *Derivation* that more precisely classify the derivation. Where these exist, the appropriate subtype of *Derivation* should be used.

TYPE .....Associative

#### INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA
BriefDescription	from SemanticInformationObject	in this SA
FullDescription	from SemanticInformationObject	in this SA

#### LOCAL META-ATTRIBUTES

DerivationLanguage  
 DerivationText  
 IsRealizationOf

1	INHERITED META-RELATIONSHIPS	
2	RootEntity.CreatedBy.ToolUser	in this SA
3	RootEntity.Has.AlternateName	in this SA
4	RootEntity.LastUpdatedBy.ToolUser	in this SA
5	RootEntity.Uses.AlternateName	in this SA
6		
7	SemanticInformationObject.IsCategorizedIn.AbstractionLevel	in this SA
8	SemanticInformationObject.ProducedBy.Derivation	in this SA
9	SemanticInformationObject.UsedIn.Derivation	in this SA
10		
11	TextualConstraint.IsConstraintOn.SemanticInformationObject	in this SA
12		

---

13	LOCAL META-RELATIONSHIPS	
14	SemanticInformationObject.ProducedBy.Derivation	
15	SemanticInformationObject.UsedIn.Derivation	
16		
17		

---

18		
19	META-ATTRIBUTE NAME.....	<b>DerivationLanguage</b>
20	CDIFMETAI DENTIFIER .....	29
21	DESCRIPTION.....	This is the language used for the body of the <i>DerivationText</i> meta-attribute.
22		
23	USAGE.....	
24	ALIASES .....	
25	CONSTRAINTS.....	This shall be supplied when there is a <i>DerivationText</i> value given.
26	DATATYPE .....	Enumerated
27	DOMAIN .....	See Computable Languages topic in Section 4.
28	LENGTH.....	
29	ISOPTIONAL.....	True
30		

---

31

1 META-ATTRIBUTE NAME.....**DerivationText**  
2 CDIFMETAIDENTIFIER .....27  
3 DESCRIPTION.....This describes the relationship between the values of the objects used  
4 in the derivation and the derived objects. The language used is  
5 defined in the meta-attribute *DerivationLanguage*.  
6 USAGE.....  
7 ALIASES .....  
8 CONSTRAINTS.....When a value is provided for this meta-attribute, the language used  
9 shall be defined in the meta-attribute *DerivationLanguage*.  
10 DATATYPE.....Text  
11 DOMAIN.....  
12 LENGTH.....  
13 ISOPTIONAL.....True  
14

---

15 META-ATTRIBUTE NAME.....**IsRealizationOf**  
16 CDIFMETAIDENTIFIER .....185  
17 DESCRIPTION.....If set to **TRUE**, this indicates that the derived object(s) are at a lower  
18 level of abstraction than the objects from which they are derived.  
19 USAGE.....For example, where *AbstractionLevels* are being used, a Data Model  
20 at a **Logical** abstraction level may be recorded as being derived from  
21 a Data Model at a **Conceptual** abstraction level. Its use is not  
22 limited to when *AbstractionLevels* are being used.  
23  
24 ALIASES .....  
25 CONSTRAINTS.....  
26 DATATYPE.....Boolean  
27 DOMAIN.....  
28 LENGTH.....  
29 ISOPTIONAL.....True  
30

---

---

31

### 5.3.5 PresentationInformationObject

NAME.....**PresentationInformationObject**  
CDIFMETAIDENTIFIER .....30  
SUBTYPEOF.....RootEntity in this SA  
SUPERTYPEOF .....

DESCRIPTION.....This object is the supertype for the definition of presentation information, which describes the graphical information about the representation of the underlying semantic model.

USAGE.....  
ALIASES .....

CONSTRAINTS.....It shall not be instantiated directly since all instances should be more precisely classified.

TYPE .....Kernel

---

---

#### INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

---

---

#### LOCAL META-ATTRIBUTES

---

---

#### INHERITED META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA

---

---

#### LOCAL META-RELATIONSHIPS

---

---

1 **5.3.6 ProcessObject**

2 NAME.....**ProcessObject**  
3 CDIFMETAIDENTIFIER .....31  
4 SUBTYPEOF.....SemanticInformationObject in this SA  
5 SUPERTYPEOF .....

6 DESCRIPTION.....This is a generic *ProcessObject*, which is used as a supertype of  
7 processing objects in more detailed Subject Areas.

8 USAGE.....  
9 ALIASES .....

10 CONSTRAINTS.....This meta-entity shall not be instantiated directly since all instances  
11 should be more precisely classified.

12 TYPE .....Kernel

---

14 INHERITED META-ATTRIBUTES

16 CDIFIdentifier	from RootObject	not in this SA
17 DateCreated	from RootObject	not in this SA
18 DateUpdated	from RootObject	not in this SA
19 TimeCreated	from RootObject	not in this SA
20 TimeUpdated	from RootObject	not in this SA
22 BriefDescription	from SemanticInformationObject	in this SA
23 FullDescription	from SemanticInformationObject	in this SA

---

25 LOCAL META-ATTRIBUTES

26 ExecutionTimeInterval  
27 ExecutionTimeUnit  
28 Name  
29 SpecificationLanguage  
30 SpecificationText

---



1 META-ATTRIBUTE NAME.....**ExecutionTimeUnit**  
2 CDIFMETAI DENTIFIER .....32  
3 DESCRIPTION.....This defines the time units used for the *ExecutionTimeInterval* meta-  
4 attribute.  
5 USAGE.....  
6 ALIASES .....  
7 CONSTRAINTS.....  
8 DATATYPE.....Enumerated  
9 DOMAIN.....Picosecond,  
10 Nanosecond,  
11 Microsecond,  
12 Millisecond,  
13 Second,  
14 Minute,  
15 Hour,  
16 Day,  
17 Week,  
18 Month,  
19 Year.  
20 LENGTH.....  
21 ISOPTIONAL.....True  
22

---

23  
24 META-ATTRIBUTE NAME.....**Name**  
25 CDIFMETAI DENTIFIER .....33  
26 DESCRIPTION.....This is the name of the *ProcessObject*.  
27 USAGE.....This meta-attribute contains the user-assigned name of a  
28 *ProcessObject*.  
29 ALIASES .....  
30 CONSTRAINTS.....  
31 DATATYPE.....String  
32 DOMAIN .....  
33 LENGTH.....256  
34 ISOPTIONAL.....True  
35

36

1 META-ATTRIBUTE NAME.....**SpecificationLanguage**  
2 CDIFMETAI DENTIFIER .....36  
3 DESCRIPTION.....This is the language used for the body of the *SpecificationText* meta-  
4 attribute.  
5 USAGE.....  
6 ALIASES .....  
7 CONSTRAINTS.....This shall be supplied when there is a *SpecificationText* value given.  
8 DATATYPE .....Enumerated  
9 DOMAIN .....See Computable Languages topic in Section 4.  
10 LENGTH.....  
11 ISOPTIONAL.....True

---

13 META-ATTRIBUTE NAME.....**SpecificationText**  
14 CDIFMETAI DENTIFIER .....35  
15 DESCRIPTION.....This describes the textual specification of a *ProcessObject*.  
16 USAGE.....  
17 ALIASES .....P-Spec, Mini-Spec  
18 CONSTRAINTS.....If a value is supplied for *SpecificationText*, the language it is  
19 expressed in shall be specified in the meta-attribute  
20 *SpecificationLanguage*.  
21 DATATYPE .....Text  
22 DOMAIN .....  
23 LENGTH.....  
24 ISOPTIONAL.....True

---

27

**5.3.7 RootEntity**

1 **5.3.7 RootEntity**

2 NAME.....**RootEntity**

3 CDIFMETAIDENTIFIER .....2

4 SUBTYPEOF.....RootObject not in this SA

5 SUPERTYPEOF .....AbstractionLevel

6 AlternateName

7 PresentationInformationObject

8 SemanticInformationObject

9 TextualConstraint

10 ToolUser

11 DESCRIPTION.....This is the supertype of all meta-entities in the CDIF Integrated

12 Meta-model and all extensions to it. This exists to define the meta-

13 attributes and meta-relationships that can be given to any meta-entity

14 instance in a CDIF Transfer.

15 USAGE.....

16 ALIASES .....

17 CONSTRAINTS.....*RootEntity* should not be used directly, since all instances should be

18 more precisely classified. The addition of new supertypes to

19 *RootEntity* through extensibility is not permitted.

20 TYPE .....Kernel

21

22

23 INHERITED META-ATTRIBUTES

24	CDIFIdentifier	from RootObject	not in this SA
25	DateCreated	from RootObject	not in this SA
26	DateUpdated	from RootObject	not in this SA
27	TimeCreated	from RootObject	not in this SA
28	TimeUpdated	from RootObject	not in this SA

29

30

31 LOCAL META-ATTRIBUTES

32

33

34 INHERITED META-RELATIONSHIPS

35

36

1 LOCAL META-RELATIONSHIPS

2     RootEntity.CreatedBy.ToolUser

3     RootEntity.Has.AlternateName

4     RootEntity.LastUpdatedBy.ToolUser

5     RootEntity.Uses.AlternateName

6

---

7

**5.3.8 SemanticInformationObject**

NAME.....**SemanticInformationObject**  
 CDIFMETAIDENTIFIER .....4  
 SUBTYPEOF.....RootEntity in this SA  
 SUPERTYPEOF .....DataObject  
                                   Derivation  
                                   ProcessObject  
 DESCRIPTION.....This is used to categorize all meta-entities in the CDIF Integrated  
                                   Meta-model that contain information about the objects being  
                                   modeled.  
 USAGE.....  
 ALIASES .....  
 CONSTRAINTS.....This meta-entity shall not be instantiated directly since all instances  
                                   should be more precisely classified.  
 TYPE .....Kernel

INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

LOCAL META-ATTRIBUTES

- BriefDescription
- FullDescription

INHERITED META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA

1 LOCAL META-RELATIONSHIPS

2 SemanticInformationObject.IsCategorizedIn.AbstractionLevel

3 SemanticInformationObject.ProducedBy.Derivation

4 SemanticInformationObject.UsedIn.Derivation

5  
6 TextualConstraint.IsConstraintOn.SemanticInformationObject  
7

---

8  
9 META-ATTRIBUTE NAME.....**BriefDescription**

10 CDIFMETAIDENTIFIER .....44

11 DESCRIPTION.....A brief unformatted description of the meta-entity instance.

12 USAGE.....A summary of the purpose and function of the meta-entity instance.

13 ALIASES .....Summary

14 CONSTRAINTS.....

15 DATATYPE.....String

16 DOMAIN.....

17 LENGTH.....1024

18 ISOPTIONAL.....True  
19

---

20  
21 META-ATTRIBUTE NAME.....**FullDescription**

22 CDIFMETAIDENTIFIER .....45

23 DESCRIPTION.....Detailed textual description of the meta-entity instance, with  
24 formatting included if required.

25 USAGE.....This is used for long descriptive text, explaining the reasons for the  
26 existence of the meta-entity instance and its usage and purpose. It is  
27 not used for specifications, etc., which should have explicit meta-  
28 attributes.

29 ALIASES .....Comment, Definition

30 CONSTRAINTS.....

31 DATATYPE.....Text

32 DOMAIN.....

33 LENGTH.....

34 ISOPTIONAL.....True  
35

---

**5.3.9 TextualConstraint**

NAME..... **TextualConstraint**  
 CDIFMETAIDENTIFIER .....51  
 SUBTYPEOF.....RootEntity in this SA  
 SUPERTYPEOF .....

DESCRIPTION..... This defines any constraint on a *SemanticInformationObject* or set of *SemanticInformationObjects* in a textual form.  
 USAGE..... This is used to capture constraints and rules not explicitly modeled within the meta-model, such as time-based constraints.  
 ALIASES .....Rule  
 CONSTRAINTS.....  
 TYPE .....Characteristic

---

INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

---

LOCAL META-ATTRIBUTES

BriefDescription  
 ConstraintExpression  
 ConstraintLanguage  
 FullDescription

---

INHERITED META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA

---

LOCAL META-RELATIONSHIPS

TextualConstraint.IsConstraintOn.SemanticInformationObject

1  
2 META-ATTRIBUTE NAME.....**BriefDescription**  
3 CDIFMETAIDENTIFIER .....52  
4 DESCRIPTION.....A brief unformatted description of the purpose of the constraint.  
5 USAGE.....  
6 ALIASES .....Summary  
7 CONSTRAINTS.....  
8 DATATYPE .....String  
9 DOMAIN.....  
10 LENGTH.....1024  
11 ISOPTIONAL.....True  
12

---

13  
14 META-ATTRIBUTE NAME.....**ConstraintExpression**  
15 CDIFMETAIDENTIFIER .....53  
16 DESCRIPTION.....Detailed specification of the *TextualConstraint*.  
17 USAGE.....  
18 ALIASES .....  
19 CONSTRAINTS.....If a value is supplied for this meta-attribute, the language used shall  
20 be specified in the meta-attribute *ConstraintLanguage*.  
21 DATATYPE .....Text  
22 DOMAIN.....  
23 LENGTH.....  
24 ISOPTIONAL.....True  
25

---

26  
27 META-ATTRIBUTE NAME.....**ConstraintLanguage**  
28 CDIFMETAIDENTIFIER .....55  
29 DESCRIPTION.....This is the language used for the body of the *ConstraintExpression*  
30 meta-attribute.  
31 USAGE.....  
32 ALIASES .....  
33 CONSTRAINTS.....This shall be supplied when there is a *ConstraintExpression* value  
34 given.  
35 DATATYPE .....Enumerated  
36 DOMAIN.....See Computable Languages topic in Section 4.  
37 LENGTH.....  
38 ISOPTIONAL.....True  
39

40

1 META-ATTRIBUTE NAME.....**FullDescription**  
2 CDIFMETAI DENTIFIER .....54  
3 DESCRIPTION.....Detailed textual description of the purpose of the constraint.  
4 USAGE.....  
5 ALIASES .....  
6 CONSTRAINTS.....  
7 DATATYPE.....Text  
8 DOMAIN.....  
9 LENGTH.....  
10 ISOPTIONAL.....True  
11

---

---

12

**5.3.10 ToolUser**

NAME..... **ToolUser**  
 CDIFMETAIDENTIFIER .....56  
 SUBTYPEOF.....RootEntity in this SA  
 SUPERTYPEOF .....

DESCRIPTION.....A person, team, project, department, etc. who can be the creator/updater of objects. These are the users of the CASE environment, rather than the end-users of the systems being represented.

USAGE.....For example, a *ProcessObject* may be created by *Fred Bloggs* and last updated by *John Doe*.

ALIASES .....Department, Team, Project, Person, Group, LoginId  
 CONSTRAINTS.....  
 TYPE .....Kernel

---

INHERITED META-ATTRIBUTES

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

---

LOCAL META-ATTRIBUTES

FullName  
 SystemName

---

INHERITED META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser	in this SA
RootEntity.Has.AlternateName	in this SA
RootEntity.LastUpdatedBy.ToolUser	in this SA
RootEntity.Uses.AlternateName	in this SA

---

LOCAL META-RELATIONSHIPS

RootEntity.CreatedBy.ToolUser  
 RootEntity.LastUpdatedBy.ToolUser

1  
2 META-ATTRIBUTE NAME.....**FullName**  
3 CDIFMETAI DENTIFIER .....57  
4 DESCRIPTION.....The full name of the *ToolUser*. This will be the name of the person,  
5 team, department, etc.  
6 USAGE.....  
7 ALIASES .....  
8 CONSTRAINTS.....  
9 DATATYPE.....String  
10 DOMAIN.....  
11 LENGTH.....256  
12 ISOPTIONAL.....True  
13

---

14  
15 META-ATTRIBUTE NAME.....**SystemName**  
16 CDIFMETAI DENTIFIER .....58  
17 DESCRIPTION.....The name by which the *ToolUser* is known to the system.  
18 USAGE.....  
19 ALIASES .....UserId, UserName, LoginId  
20 CONSTRAINTS.....  
21 DATATYPE.....String  
22 DOMAIN.....  
23 LENGTH.....32  
24 ISOPTIONAL.....False  
25

---

---

26

1 **5.4 Meta-relationship Definitions**

2 **5.4.1 RootEntity.CreatedBy.ToolUser**

3 NAME..... **CreatedBy**  
4 CDIFMETAIDENTIFIER ..... 68  
5 SUBTYPEOF..... RootEntity.IsRelatedTo.RootEntity not in this SA  
6 SUPERTYPEOF .....

7	MINSOURCECARD.....	0	
8	MAXSOURCECARD.....	N	
9	MINDESTCARD.....	0	
10	MAXDESTCARD.....	1	

11 DESCRIPTION..... This relates a *RootEntity* with the *ToolUser* who initially created it.  
12 USAGE..... This meta-relationship may be used for audit trails, change tracking,  
13 etc.  
14 ALIASES ..... DefinedBy, OriginatedBy  
15 CONSTRAINTS.....  
16

---

17 INHERITED META-ATTRIBUTES

19	CDIFIdentifier	from RootObject	not in this SA
20	DateCreated	from RootObject	not in this SA
21	DateUpdated	from RootObject	not in this SA
22	TimeCreated	from RootObject	not in this SA
23	TimeUpdated	from RootObject	not in this SA

24

---

25 LOCAL META-ATTRIBUTES  
26  
27

---

**5.4.2 RootEntity.Has.AlternateName**

NAME.....**Has**  
 CDIFMETAIDENTIFIER .....69  
 SUBTYPEOF.....RootEntity.IsRelatedTo.RootEntity           not in this SA  
 SUPERTYPEOF .....

MINSOURCECARD ..... 1  
 MAXSOURCECARD ..... 1  
 MINDESTCARD ..... 0  
 MAXDESTCARD ..... N

DESCRIPTION.....This enables an object to have aliases. Each alias is stored in a separate occurrence of *AlternateName*. Each is connected to the relevant object by an instance of this meta-relationship.

USAGE.....

ALIASES .....HasAlias

CONSTRAINTS.....This shall be used only where the source object has a *Name* meta-attribute defined in the CDIF Integrated Meta-model or added through extensibility. It shall not be used for adding a name to an otherwise nameless object. This meta-relationship shall not be used from a source object of type *AlternateName*, thereby giving alternate names to alternate names.

**INHERITED META-ATTRIBUTES**

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

**LOCAL META-ATTRIBUTES**



**5.4.4 RootEntity.Uses.AlternateName**

NAME..... **Uses**  
 CDIFMETAIDENTIFIER ..... 71  
 SUBTYPEOF.....RootEntity.IsRelatedTo.RootEntity not in this SA  
 SUPERTYPEOF .....

MINSOURCECARD .....0  
 MAXSOURCECARD.....N  
 MINDESTCARD .....0  
 MAXDESTCARD .....1

DESCRIPTION.....Where any object refers to another by one of its alternate names, this meta-relationship is used to indicate which of the set of alternate names is being used.

USAGE.....Where instance **A** of object Q is related to instance **B** of object R by an instance of meta-relationship W, but refers to **B** by one of its *AlternateNames*, an instance of this meta-relationship shall be used to indicate which *AlternateName* instance related to **B** (by the meta-relationship *RootEntity.Has.AlternateName*) is to be used. The instance of this meta-relationship does not replace the need for the instance of W, it merely indicates the name to be used when interpreting that relationship.

ALIASES .....

CONSTRAINTS.....This meta-relationship shall only be used to connect instances where the other relevant meta-relationship instances exist: a connection between the source of this meta-relationship and another object, and a corresponding instance of *RootEntity.Has.AlternateName* between that other object and the destination *AlternateName* instance of this meta-relationship instance.

**INHERITED META-ATTRIBUTES**

CDIFIdentifier	from RootObject	not in this SA
DateCreated	from RootObject	not in this SA
DateUpdated	from RootObject	not in this SA
TimeCreated	from RootObject	not in this SA
TimeUpdated	from RootObject	not in this SA

**LOCAL META-ATTRIBUTES**

**5.4.5 SemanticInformationObject.IsCategorizedIn.AbstractionLevel**

NAME.....**IsCategorizedIn**  
 CDIFMETAIDENTIFIER ..... 72  
 SUBTYPEOF.....RootEntity.IsRelatedTo.RootEntity           not in this SA  
 SUPERTYPEOF .....

MINSOURCECARD .....0  
 MAXSOURCECARD.....N  
 MINDESTCARD .....0  
 MAXDESTCARD .....N

DESCRIPTION.....This relates one or more *SemanticInformationObjects* to the  
*AbstractionLevel* that identifies the level at which the objects are  
 defined or used.

USAGE.....  
 ALIASES .....

CONSTRAINTS.....

---

INHERITED META-ATTRIBUTES			
CDIFIdentifier	from RootObject		not in this SA
DateCreated	from RootObject		not in this SA
DateUpdated	from RootObject		not in this SA
TimeCreated	from RootObject		not in this SA
TimeUpdated	from RootObject		not in this SA

---

LOCAL META-ATTRIBUTES

---

**5.4.6 SemanticInformationObject.ProducedBy.Derivation**

NAME.....**ProducedBy**  
 CDIFMETAIDENTIFIER ..... 73  
 SUBTYPEOF.....RootEntity.IsRelatedTo.RootEntity not in this SA  
 SUPERTYPEOF .....

MINSOURCECARD ..... 1  
 MAXSOURCECARD.....N  
 MINDESTCARD ..... 0  
 MAXDESTCARD ..... N

DESCRIPTION.....This relates one or more *SemanticInformationObjects* to the  
*Derivation* used to produce them. It connects the outputs of a  
 derivation to the derivation itself.

USAGE.....  
 ALIASES .....

CONSTRAINTS.....

---

INHERITED META-ATTRIBUTES			
CDIFIdentifier	from RootObject		not in this SA
DateCreated	from RootObject		not in this SA
DateUpdated	from RootObject		not in this SA
TimeCreated	from RootObject		not in this SA
TimeUpdated	from RootObject		not in this SA

---

LOCAL META-ATTRIBUTES

---

1 **5.4.7 SemanticInformationObject.UsedIn.Derivation**

2 NAME..... **UsedIn**  
3 CDIFMETAIDENTIFIER ..... 74  
4 SUBTYPEOF..... RootEntity.IsRelatedTo.RootEntity not in this SA  
5 SUPERTYPEOF .....

6 MINSOURCECARD .....	1
7 MAXSOURCECARD .....	N
8 MINDESTCARD .....	0
9 MAXDESTCARD .....	N

10 DESCRIPTION..... This relates all the *SemanticInformationObjects* used in a particular  
11 derivation to the *Derivation* concerned. These are the inputs to the  
12 derivation.  
13 USAGE.....  
14 ALIASES .....

15 CONSTRAINTS.....
---------------------

16

---

17  
18 INHERITED META-ATTRIBUTES

19 CDIFIdentifier	from RootObject	not in this SA
20 DateCreated	from RootObject	not in this SA
21 DateUpdated	from RootObject	not in this SA
22 TimeCreated	from RootObject	not in this SA
23 TimeUpdated	from RootObject	not in this SA

24

---

25 LOCAL META-ATTRIBUTES

---

26  
27  
28

---

**5.4.8 TextualConstraint.IsConstraintOn.SemanticInformationObject**

1  
 2 NAME.....**IsConstraintOn**  
 3 CDIFMETAIDENTIFIER .....80  
 4 SUBTYPEOF.....RootEntity.IsRelatedTo.RootEntity not in this SA  
 5 SUPERTYPEOF .....

6	MINSOURCECARD.....0		
7	MAXSOURCECARD.....N		
8	MINDESTCARD .....1		
9	MAXDESTCARD .....N		

10 DESCRIPTION.....This relates one or more *SemanticInformationObjects* to any  
 11 *TextualConstraints* imposed on those objects.  
 12 USAGE.....  
 13 ALIASES .....

14	CONSTRAINTS.....		
----	------------------	--	--

15

---

INHERITED META-ATTRIBUTES

18	CDIFIdentifier	from RootObject	not in this SA
19	DateCreated	from RootObject	not in this SA
20	DateUpdated	from RootObject	not in this SA
21	TimeCreated	from RootObject	not in this SA
22	TimeUpdated	from RootObject	not in this SA

23  
 24

---

LOCAL META-ATTRIBUTES

---

## 6. REFERENCED META-OBJECT DEFINITIONS

### 6.1 AttributableMetaObject

#### 6.1.1 RootObject

NAME.....**RootObject**  
CDIFMETAIDENTIFIER ..... 1  
SUBTYPEOF.....  
SUPERTYPEOF .....RootEntity  
                                  RootEntity.IsRelatedTo.RootEntity  
DESCRIPTION.....This object is the root object of the CDIF AttributableMetaObject  
                                  Hierarchy. It can be extended by the addition of new meta-attributes,  
                                  which will have the effect of adding the new meta-attribute to every  
                                  meta-entity and meta-relationship.  
USAGE.....It is abstract, and cannot be instantiated.  
ALIASES .....  
CONSTRAINTS.....No supertypes can be added to *RootObject* through extensibility.

---

---

#### INHERITED META-ATTRIBUTES

---

---

#### LOCAL META-ATTRIBUTES

CDIFIdentifier  
DateCreated  
DateUpdated  
TimeCreated  
TimeUpdated

---

---

#### INHERITED META-RELATIONSHIPS

---

---

#### LOCAL META-RELATIONSHIPS

---

---

1 META-ATTRIBUTE NAME.....**CDIFIdentifier**  
2 CDIFMETAIDENTIFIER .....5  
3 DESCRIPTION.....*CDIFIdentifier* is a unique identifier. A unique value shall be  
4 provided for this meta-attribute for all instances of meta-entities and  
5 meta-relationships in a transfer.  
6 No semantic meaning is conveyed by the *CDIFIdentifier*. Uniqueness  
7 is within the scope of a single transfer.  
8 USAGE.....*CDIFIdentifier* is used to identify referenced instances in the Model  
9 Section of a Transfer.  
10 ALIASES .....

---

11 CONSTRAINTS.....  
12 DATATYPE.....Identifier  
13 DOMAIN .....

---

14 LENGTH.....  
15 ISOPTIONAL.....False  
16

17  
18 META-ATTRIBUTE NAME.....**DateCreated**  
19 CDIFMETAIDENTIFIER .....6  
20 DESCRIPTION.....This contains the date of creation of the object.  
21 USAGE.....  
22 ALIASES .....

---

23 CONSTRAINTS.....None  
24 DATATYPE.....Date  
25 DOMAIN.....Any valid Date value.  
26 LENGTH.....  
27 ISOPTIONAL.....True  
28

29  
30 META-ATTRIBUTE NAME.....**DateUpdated**  
31 CDIFMETAIDENTIFIER .....7  
32 DESCRIPTION.....This contains the date of most recent update of the object.  
33 USAGE.....  
34 ALIASES .....

---

35 CONSTRAINTS.....If a value is given for *DateCreated*, then the absolute timestamp  
36 indicated by *DateUpdated*, together with the *TimeUpdated* if  
37 supplied, shall not be earlier than that of *DateCreated*, together with  
38 *TimeCreated* if supplied  
39 DATATYPE.....Date  
40 DOMAIN .....

---

41 LENGTH.....  
42 ISOPTIONAL.....True  
43

1  
2 META-ATTRIBUTE NAME..... **TimeCreated**  
3 CDIFMETAIDENTIFIER .....8  
4 DESCRIPTION..... This contains the time of creation of the object, and shall be specified  
5 in UTC (Universal Co-ordinated Time), which is defined in  
6 Recommendation 460 of the Consultative Committee on  
7 International Radio (CCIR).  
8 USAGE.....  
9 ALIASES .....

10 CONSTRAINTS..... If a *TimeCreated* value is specified, there shall be a value provided  
11 for *DateCreated*.  
12 DATATYPE..... Time  
13 DOMAIN..... Any valid time.  
14 LENGTH.....  
15 ISOPTIONAL..... True  
16

---

17  
18 META-ATTRIBUTE NAME..... **TimeUpdated**  
19 CDIFMETAIDENTIFIER .....9  
20 DESCRIPTION..... This contains the time of most recent update of the object, and shall  
21 be specified in UTC (Universal Co-ordinated Time).  
22 USAGE.....  
23 ALIASES .....

24 CONSTRAINTS..... If a *TimeUpdated* value is specified, there shall be a value provided  
25 for *DateUpdated*.  
26 DATATYPE..... Time  
27 DOMAIN..... Any valid time.  
28 LENGTH.....  
29 ISOPTIONAL..... True  
30

---

---

31

1 **6.2 Meta-entity Definitions**

2 There are no references to meta-entities that are not used in this subject area.



1

2

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1  
2

## APPENDIX A<sup>1</sup> QUESTIONS AND ANSWERS

3

### A1. Introduction

4 The following questions and answers are presented in order to help the reader's understanding of  
5 the standard. They have been derived from discussions held within the CDIF Technical  
6 Committee and during presentations to outside observers.

7

### A2. General

8

#### Question 1:

9 **Why are *Foundation* and *Common* two distinct subject areas?**

10

#### Answer:

11 The Foundation Subject Area has been kept distinct from all the other subject areas because it  
12 defines the fundamental supertypes of the CDIF type hierarchy, that are required to be used even  
13 when no other parts of the Integrated Meta-model are used. Even if an exporter is using only  
14 extensibility, the Foundation Subject Area must be referenced.

15 The Common Subject Area contains objects that are common to all other subject areas of the  
16 standard CDIF Integrated Meta-model; these concepts may not be applicable to, or may even  
17 conflict with, those used by an exporter solely using extensibility. For this reason, the two subject  
18 areas have been kept distinct.

---

<sup>1</sup>This appendix is not a formal part of the attached EIA Standard but is included for the purposes of information only.

### 1 **A3. Naming**

#### 2 **Question 2:**

3 **Why is there no *Name* meta-attribute defined for every object?**

#### 4 **Answer:**

5 *Name* has not been provided as an meta-attribute on the generic supertypes to be inherited by all  
6 the subtypes since its occurrence can be mandatory on some objects, optional on some objects,  
7 and without meaning on others. Also, the definition of the exact semantics of the *Name* meta-  
8 attribute varies from object to object and must be precisely specified in each case.

#### 9 **Question 3:**

10 **Is the name space for *AlternateName* unique?**

#### 11 **Answer:**

12 The uniqueness of *AlternateName* is not defined in the standard and therefore the values need not  
13 be unique.

#### 14 **Question 4:**

15 **How should *Name* and *LongName* be used?**

#### 16 **Answer:**

17 *Name* is a reasonably short length and acts as a tag. *LongName* is more of a descriptive name  
18 usually accompanying *Name*.

### 19 **A4. Audit Data**

#### 20 **Question 5:**

21 **Why are the meta-relationships between *RootEntity* and *ToolUser* not mandatory?**

#### 22 **Answer:**

23 Where an exporting tool does not store any information about users, objects in this tool would  
24 have no recorded creator or modifier and thus there would be nothing to export. Therefore, the  
25 meta-relationships between *RootEntity* and *ToolUser* must be optional.

1 **Question 6:**

2 **Why isn't Version Control covered?**

3 **Answer:**

4 The CDIF Technical Committee is aware of other standards efforts that are addressing this issue  
5 and thus has no wish to replicate effort. Additionally, the problem remains of mandating a  
6 particular version control scheme that may not meet the needs of particular exporters and  
7 importers. This remains an open issue.

8 **A5. Extensibility**

9 **Question 7:**

10 **How can new meta-attributes be added to meta-entities and meta-relationships in the**  
11 **Common Subject Area? Can both the semantic information and the presentation**  
12 **information be extended?**

13 **Answer:**

14 New meta-attributes can be added to any of the meta-objects in the standard subject area, through  
15 the creation of a new subject area, called for example *MyCommonSubjectArea*, which uses the  
16 meta-objects to be extended and adds the new meta-attributes required.

17 Additional meta-attributes can be added to every **semantic** meta-entity by extending the meta-  
18 attributes of *SemanticInformationObject*. Similarly, additional meta-relationships can be defined  
19 for every semantic meta-entity by using *SemanticInformationObject* as either the source or  
20 destination of a new meta-relationship.

21 Extensions to all **presentation** objects can be achieved by extending  
22 *PresentationInformationObject* in the same manner as for *SemanticInformationObject*.

23 For a more detailed discussion of extensibility, please see *EIA/IS-107 CDIF - Framework for*  
24 *Modeling and Extensibility*.

## 1 **A6. Modeling**

### 2 **Question 8:**

3 **Why have no keys or unique identifiers been defined for any of the objects?**

#### 4 **Answer:**

5 In general, there is no attribute or set of attributes that can be defined as the unique identifier for  
6 an object across all analysis and design methods that have a need for a definition of that object. In  
7 some cases, a name may need to be unique, whereas in others it may be qualified by the name of  
8 some scoping object. It is not the intention of this standard to define or enforce some arbitrary  
9 name-uniqueness rules.

10 For the purposes of the transfer of information between tools, a unique identifier for each object  
11 in the transfer that can be referenced by other objects in the same transfer is required. This is  
12 achieved by the use of the *CDIFIdentifier* meta-attribute of the *RootObject*, which is defined in  
13 this document. This has no meaning other than as a unique identifier for the meta-object for the  
14 duration of the transfer.

### 15 **Question 9:**

16 **Why is there no general decomposition mechanism?**

#### 17 **Answer:**

18 A general decomposition mechanism that would allow any semantic object to decompose into any  
19 other semantic object would make the task of the importing tool nearly impossible. The CDIF  
20 Integrated Meta-model defines semantics for decomposition in relevant subject areas, where the  
21 scope of the decomposition is finite and constrained. On this basis, importing tools can be  
22 expected to interpret a CDIF transfer.

### 23 **Question 10:**

24 **What does having a single subtype of a supertype mean?**

#### 25 **Answer:**

26 A single subtype of a supertype is used as a classification mechanism. For example, in Figure A1  
27 the supertype *Customer* has a single subtype *CreditCustomer*. This subtype has properties  
28 peculiar to a credit customer, such as credit limit. All other types of customer are thus treated in a  
29 generic manner through the supertype properties.

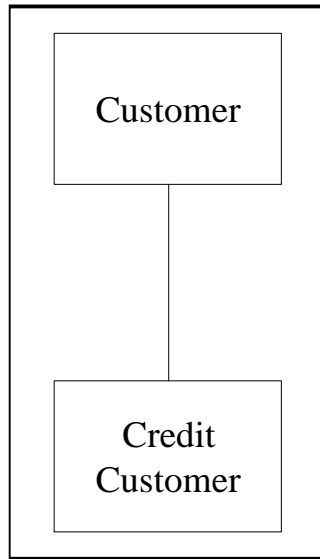


Figure A1  
Single Subtype

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3  
4 **Question 11:**

5 **How do you enforce the rules of XYZ methodology?**

6 **Answer:**

7 It is not the role of an Interchange Format to enforce the rules of any specific methodology; it  
8 must be capable of supporting information in the areas covered, expressed by any methodology  
9 covering that area. There is no way of expressing the methodology itself in the standard at  
10 present. In a future release of the standard, support for method-specific rules may be included as a  
11 new subject area of the CDIF Integrated Meta-model.

1 **Question 12:**

2 **Why has the abstraction level been modeled using a Meta-entity, rather than a Meta-**  
3 **attribute inherited by every Meta-entity?**

4 **Answer:**

5 It has been modeled in this manner to be able to capture the fact that an object may have the same  
6 definition in more than one level of abstraction. This cannot be modeled using a single-valued  
7 meta-attribute. For example, an *Entity* may have the same definition in a conceptual data model  
8 and in a logical data model. This is represented by relating the same *Entity* definition to the two  
9 different instances of *AbstractionLevel* that represent the two levels of abstraction.

10 **Question 13:**

11 **Can *ProcessObject* be used to model Functions or Business Functions?**

12 **Answer:**

13 It is not intended that *ProcessObject* be used to model any type of process. *ProcessObject* is an  
14 abstract supertype for processing objects, just as *DataObject* is an abstract supertype for objects  
15 containing data, such as *Entity*, *DataStore*, etc. Until Functions and Business Functions are  
16 modeled explicitly within the CDIF Integrated Meta-model, extensibility should be used to add  
17 concrete subtypes to *ProcessObject*, along with any required meta-relationships and meta-  
18 attributes to enable the required information to be expressed.

19 **Question 14:**

20 **Why do the meta-relationships *RootEntity.Has.AlternateName* and**  
21 ***RootEntity.Uses.AlternateName* appear as both inherited and local meta-relationships in the**  
22 **definition of the meta-entity *AlternateName*?**

23 **Answer:**

24 They appear as inherited meta-relationships because the meta-entity *AlternateName* is a subtype  
25 of *RootEntity*, and therefore can theoretically act as a source meta-entity for the meta-  
26 relationship. They appear as local meta-relationship because *AlternateName* is itself the  
27 destination meta-entity for the meta-relationships. In fact, to avoid being able to define alternate  
28 names for alternate names, a constraint is explicitly given on *RootEntity.Has.AlternateName* to  
29 prevent this; however this does not remove the fact that the meta-relationship is theoretically  
30 inherited by *AlternateName* as a valid subtype meta-entity for acting as a source for the meta-  
31 relationships.

**Question 15:**

**How are *AbstractionLevels* and *Derivations* used?**

**Answer:**

*AbstractionLevels* are used to relate all objects that are defined at a given level of abstraction. In Figure A2, there are two data models; one is conceptual and the other logical. The definition of the entity *Customer* is the same in both models, but the single entity *Order* in the conceptual data model has been replaced by two entities, *Order* and *OrderLine* in the logical data model. Figure A3 shows how the relationship between *Order* in the conceptual data model could be related to the two entities in the logical data model to record the fact that they are derived from it. This can be regardless of whether *AbstractionLevel* has been used.

Note that in Figures A2 and A3, the meta-entities and meta-relationships whose names are shown in normal italic are examples only, and are not defined in the Common Subject Area, or necessarily in any part of the CDIF Integrated Meta-model; they are purely used for the purposes of this illustration.

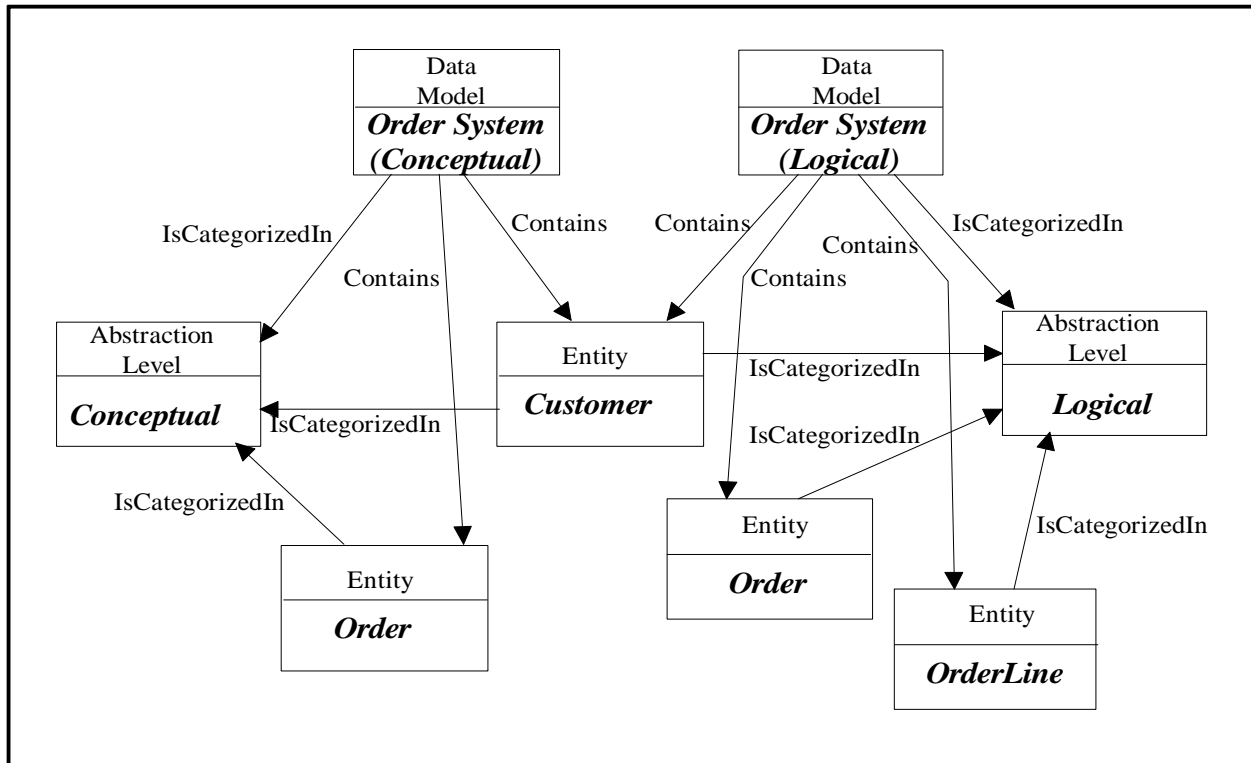
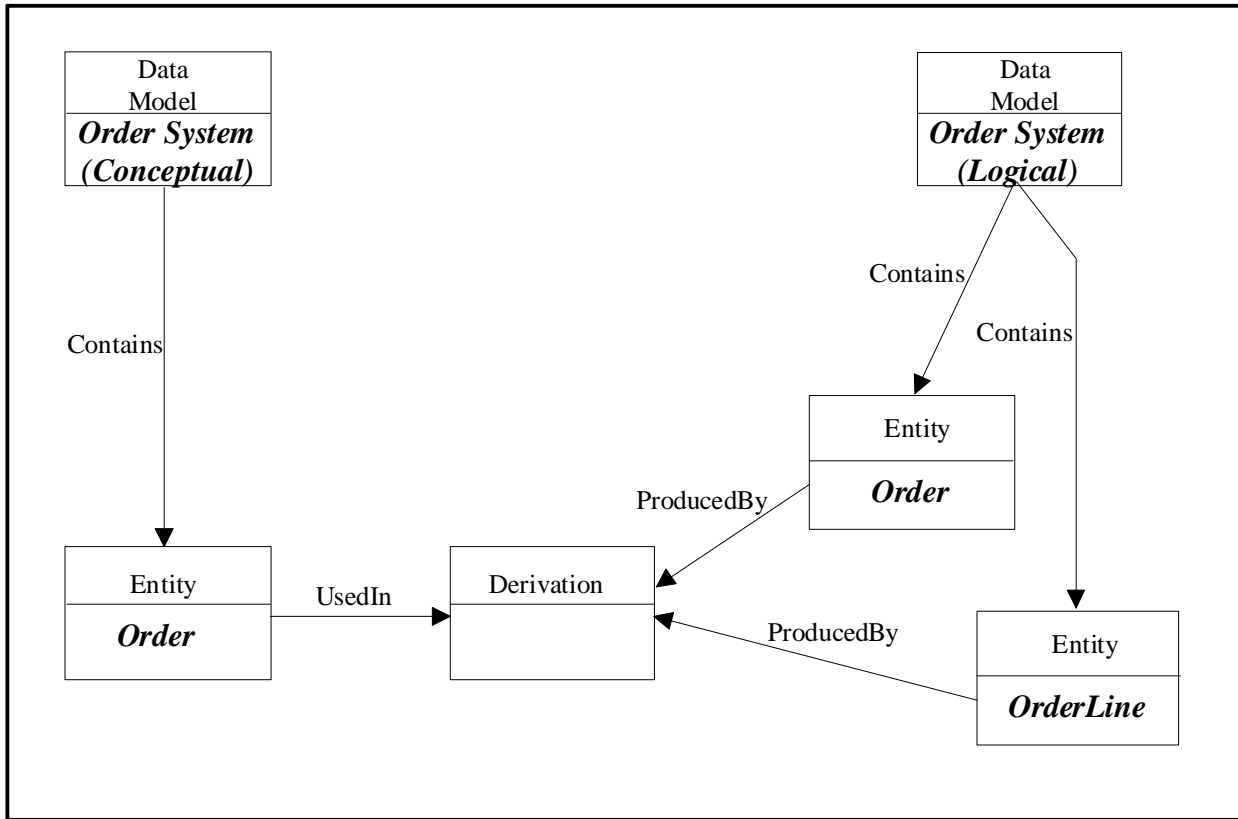


Figure A2  
 Instance diagram showing example of abstraction levels



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Figure A3  
Instance diagram showing example of derivation

1

## GLOSSARY<sup>1</sup>

<b>ASSOCIATIVE ENTITY</b>	An entity used to represent a relationship between other entities. Used when a relationship does not otherwise provide sufficient mechanisms.
<b>ATTRIBUTE</b>	A single-valued characteristic of an entity or relationship.
<b>CDIF</b>	See <i>CDIF Family of Standards</i> .
<b>CDIF FAMILY OF STANDARDS</b>	The CDIF Family of Standards is composed of a set of standards that, when used together, provide a standard definition for the interchange of information between CASE tools.
<b>CDIF IDENTIFIER</b>	An attribute that uniquely identifies an object in the Model Section of a transfer.
<b>CDIF INTEGRATED META-MODEL</b>	The description of the set of concepts and notations used to define a model. The CDIF Integrated Meta-model defines an Entity-Relationship-Attribute model that is used to construct and define models used in systems development.
<b>CDIF METAIDENTIFIER</b>	A meta-meta-attribute that uniquely identifies a meta-object in the Meta-model Section of a transfer.
<b>CHARACTERISTIC ENTITY</b>	Each instance of a characteristic meta-entity is logically only related to one instance of one other meta-entity. Therefore an importer could incorporate the meta-attributes of a characteristic meta-entity with those of the 'owning' meta-entity, where the owning meta-entity is the one to which the characteristic meta-entity is related with a cardinality of 1:1.

---

<sup>1</sup>This glossary is not a formal part of the attached EIA standard, but is included for information purposes only.

**CONSTRAINT**

A constraint is generally a restriction on the value of an attribute or the existence of any object based on the value or existence of one or more others. In CDIF a constraint may be classed as computable (i.e., code may be built to implement the constraint) or non-computable (e.g., a constraint expressed in natural language). An example of a non-computable constraint - "No two instances of *DFMProcess* may have the same value for the meta-attribute *Name*". An example of a computable *textual constraint* "*ForAny (DFMProcess,c) Unique (c.Name)*".

**DATA-MODEL**

A model about data by which a reasonable interpretation of the data can be obtained. In the CASE industry a data model is one that may be encoded and manipulated by a computer.

**ENTITY**

An object (i.e., thing, event or concept) that occurs in a model (i.e., transfer).

**INSTANCE**

An individual occurrence of a type (e.g., the diagram *MyDiagram* is an instance of the *Diagram* type).

Usually, an instance is an object that occurs one meta-level beneath its (type's) definition. This is not always true, however (e.g., within the Presentation Model where icon type definitions and their instances are both contained within the same meta-level).

**INTEGRATED META-MODEL**

See *CDIF Integrated Meta-model*.

**KERNEL ENTITY**

This classification is used for a meta-entity whose instances are meaningful without the occurrences of other meta-entities. For example, an instance of the meta-entity called *Attribute*, having a name, full description and brief description, is significant without the knowledge of the *DataObject* it describes.

**META**

According to Webster's Ninth New Collegiate Dictionary: *more comprehensive: transcending - used with the name of a discipline to designate a new but related discipline designed to deal critically with the original one.*

Meta- is used in CDIF generally as a prefix to a concept to imply definition information about the concept. Specifically, used to designate the location of an object in the three model layers.

**META-ATTRIBUTE**

A definition of a characteristic of a meta-entity or meta-relationship. Instances of a meta-attribute occur in a model as data values.

**META-ENTITY**

A definition of a type of data object that occurs in CDIF models. Specifically, a meta-entity represents a set of zero or more meta-attributes, stored together to represent a thing, event or concept that has instances in a model.

**META-LAYERS**

See *Model Layers*.

**META-MODEL**

A meta-model contains detailed definitions of the meta-entities, meta-relationships and meta-attributes whose instances represent an actual CDIF transfer.

The CDIF Integrated Meta-model (as defined in the set of standards that comprise the CDIF Family of Standards) is a definition of all of the types of information that can be transferred in a CDIF Transfer without using the CDIF extensibility mechanism.

While the terms semantic model and data model are usually exact synonyms for meta-model, they are occasionally used when discussing a different meta-level.

**META-OBJECT**

A meta-object is a generic term for meta-entities and meta-relationships

**META-RELATIONSHIP**

A definition of a type of data object that occurs in CDIF models. Specifically, a meta-relationship represents the definition of a relationship between meta-entities that has instances in a model. A meta-relationship may also define a set of zero or more meta-attributes, stored together to represent characteristics of a relationship between meta-entities.

**MODEL**

A specific collection of software engineering data. This is called a model because it usually represents a model of a software system under development.

A collection of instances of meta-objects.

**MODEL LAYERS**

The different layers of definition (or abstraction) used in defining the CDIF Family of Standards. The four model layers in CDIF are: user data, model, meta-model, meta-meta-model.

Any given model layer provides an accurate and complete definition of all the instances that may occur one layer below the given layer. For example, the meta-meta-model provides a set of definitions that are used to construct and understand the meta-model; the meta-model provides a set of definitions that are used to construct and understand a model.

**PRESENTATION MODEL**

The portion of the CDIF Integrated Meta-model that defines how graphical and presentation information is represented.

**RELATIONSHIP**

A real-world association among one or more entities. Where the association is between an entity and itself, the relationship is said to be recursive.

**SEMANTIC MODEL**

The portion of the CDIF Integrated Meta-model that defines how semantic (i.e., non-graphical) information is represented.

**SUBJECT AREA**

A related collection of meta-object instance definitions. Subject areas are used to define scoped areas of interest. Subject areas overlap to ensure the integration of the overall Meta-model, but a tool need only use those subject areas relevant to the data to be exported/imported.



## REFERENCES

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The following standards contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed. Members of IEC and ISO maintain registers of currently valid International Standards.

ANSI X8.58-1976, American National Standard Programming Language PL/1

ANSI/MDC X11.1-1990, American National Standard for Information Systems - Programming Language - MUMPS

ANSI/IEEE 770/X8.97-1983, American National Standard for Information Systems - Programming Language - Pascal

ANSI/IEEE 770/X8.160-1989, American National Standard for Information Systems - Programming Language - Extended Pascal

ANSI/MIL-STD-1815A-1983, American National Standard for Information Systems - Reference Manual for the Ada<sup>®</sup> Programming Language

ISO/IEC 1539:1980(E) Fortran

ISO/IEC 1539:1991 Extended Fortran

ISO/IEC 9899:1990(E), International Standard for Programming Languages - C

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## **RELATED EIA STANDARDS**

*EIA/IS-106 CDIF - CASE Data Interchange Format - Overview*

*EIA/IS-107 CDIF - Framework for Modeling and Extensibility*

*EIA/IS-111 CDIF - Integrated Meta-model - Foundation Subject Area*

*EIA/IS-113 CDIF - Integrated Meta-model - Data Definition Subject Area*



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40 ISBN 0-7908-0018-7

## PREFACE

This standard will assist the vendors and users of CASE tools in developing mechanisms for interchanging information between CASE tools. This standard specifies an element of a family of related standards. When used together, these standards specify a mechanism for transferring information between CASE tools.

***EIA/IS-106 CDIF - CASE Data Interchange Format - Overview and EIA/IS-107 CDIF - Framework for Modeling and Extensibility* should be read first when initially exploring CDIF.** The first explains the overall CDIF Architecture and how the family of standards fits together. The second explains the scope, and modeling approach in CDIF. The CDIF Meta-meta-model and extensibility mechanism are also defined in that document.

This standard explains the Common subject area of the CDIF Integrated Meta-model, that defines information common to all other objects in the Integrated Meta-model. The CDIF Integrated Meta-model is used to ensure that the information transferred by tools communicating using CDIF is expressed with an agreed meaning.

This standard has been developed with the wide support and participation of vendors, users, academia and government involved in or familiar with the CASE industry, its products and the general requirements associated with interchanging information between these products.

The material contained in this publication was formulated under the cognizance of the CDIF Technical Committee.

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