



TECHNICAL REPORT	EIA-IS-111™	
	Issued 1994-01 Stabilized 2015-07	
CDIF - Integrated Meta-model Foundation Subject Area		

NOTICE

This document has been taken directly from the original TechAmerica document and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE Technical Standards. The release of this document is intended to replace the original with the SAE International document. Any numbers established by the original document remain unchanged.

The original document was adopted as an SAE publication under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of specifications and standards. TSB rules provide for (a) the publication of portions of unrevised specifications and standards without consensus voting at the SAE committee level, and (b) the use of the existing specification or standard format.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2016 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE WEB ADDRESS:

Full document details: [SAE EIAIS111](#)

SAE values your input. To provide feedback on this Technical Report, please visit <http://www.sae.org/technical/standards/EIAIS111>

Documents
Visit Document Sharing Hub

Interim Standard

EIA/IS-111

CDIF



CASE Data Interchange Format
A Division of Electronic Industries Association

**CDIF Integrated Meta-model
Foundation Subject Area**

January 1994

**Electronic Industries Association
CDIF Technical Committee**



Documents

Document Sharing Hub

NOTICE

EIA Engineering standards and publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such standards and publications shall not in any respect preclude any member or nonmember of EIA from manufacturing or selling products not conforming to such standards and publications, nor shall the existence of such standards and publications preclude their voluntary use by those other than EIA members, whether the standard is to be used either domestically or internationally.

Recommended standards and publications are adopted by EIA without regard to whether or not their adoption may involve patents on articles, materials or processes. By such action, EIA does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the standard or publication.

EIA INTERIM STANDARDS

EIA Interim Standards contain information deemed to be of technical value to the industry, and are published at the request of the originating Committee without necessarily following the rigorous public review and resolution of comments which is a procedural part of the development of an EIA Recommended Standard.

EIA Interim Standards should be reviewed on an annual basis by the formulating Committee and a decision made on whether to proceed to develop an EIA Recommended Standard on this subject. EIA Interim Standards must be canceled by the Committee and removed from the EIA Standards Catalog before the end of their third year of existence.

This EIA standard is considered to have international standardization implication, but the International Standardization Organization activity has not progressed to the point where a valid comparison between the EIA standard and the ISO work can be made.

COPYRIGHT 1994

Published by
ELECTRONIC INDUSTRIES ASSOCIATION
2500 Wilson Blvd.
Arlington, VA 22201

PRICE: Please refer to the current
Catalog of EIA & JEDEC STANDARDS & ENGINEERING PUBLICATIONS
or contact EIA Electronic Information Group
Phone: (703) 907-7545, FAX: (703) 907-7501

All rights reserved
Printed in U.S.A.

ISBN 0-7908-0017-9

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 Foundation subject area of the CDIF Integrated Meta-model, which is used to ensure that the information held by tools communicating using CDIF express the information they pass with an agreed meaning. This subject area contains the basic objects on which all others, including extensions, must be based.

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.

CONTENTS

1. SCOPE.....	1
2. INTRODUCTION.....	3
2.1. Audience	3
2.2. Structure of this Document	3
2.3. Conventions	4
3. STRUCTURE OF SUBJECT AREA DEFINITION	5
3.1. Introduction.....	5
3.2. Structure of Subject Area Overview.....	5
3.2.1. Summary	5
3.2.2. Description of Major Concepts	5
3.2.3. Diagram	5
3.2.4. AttributableMetaObject Hierarchy	7
3.2.5. Meta-object Summaries	7
3.3. Structure of Subject Area Detailed Definitions.....	8
3.3.1. Summary	8
3.3.2. Subject Area Definition	8
3.3.3. AttributableMetaObject Definition.....	8
3.3.4. Meta-entity Definitions	8
3.3.5. Meta-relationship Definitions.....	10
4. SUBJECT AREA OVERVIEW	12
4.1. Description.....	12
4.2. Diagram	13
4.3. AttributableMetaObject Hierarchy.....	13
4.4. AttributableMetaObject Summary	14
4.5. MetaEntity Summary.....	14
4.6. MetaRelationship Summary	14
5. SUBJECT AREA DETAILED DEFINITIONS.....	15
5.1. Introduction.....	15
5.2. Subject Area Definition.....	16
5.3. AttributableMetaObject Definitions.....	17
5.3.1. RootObject	17
5.4. Meta-entity Definitions	20
5.4.1. RootEntity	20
5.5. Meta-relationship Definitions	21
5.5.1. RootEntity.IsRelatedTo.RootEntity	21
APPENDIX A QUESTIONS AND ANSWERS.....	23
A1. Introduction.....	23
A2. General.....	23

GLOSSARY 27

INDEX..... 35

RELATED EIA STANDARDS INSIDE BACK COVER

FIGURES

Figure 1 Position in the CDIF Family of Standards 1

Figure 2 Conventions for Representing Meta-entities 6

Figure 3 Conventions for Representing Meta-relationships 6

Figure 4 Foundation Subject Area..... 13

Figure A1 Single Subtype 25

TABLES

Table 1 Contents of Subject Area Definition 8

Table 2 Contents of Meta-entity Definition 9

Table 3 Contents of Local Meta-attribute Definition..... 10

Table 4 Contents of Meta-relationship Definition 11

1. SCOPE

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

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

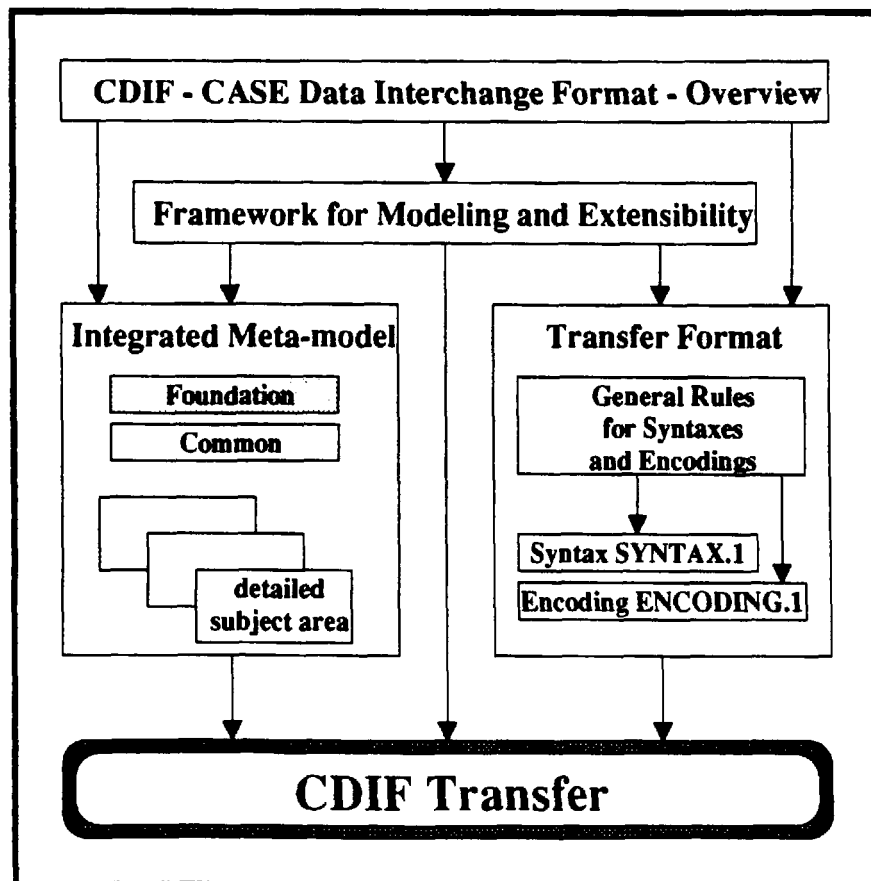


Figure 1
Position in the CDIF Family of Standards

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

This standard defines the Foundation subject area of the CDIF Integrated Meta-model. This subject area contains the basic objects on which all other objects, including those defined using extensibility, must be based.

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.

The document *EIA/IS-106 CDIF - CASE Data Interchange Format - Overview* and the document *EIA/IS-107 CDIF - Framework for Modeling and Extensibility* should be read first when initially exploring CDIF and before attempting to read other documents in 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.

Section 3 'Structure of Subject Area Definition'

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

Section 4 'Subject Area Overview'

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

Section 5 'Subject Area Detailed Definitions'

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

Section 6 'Referenced Meta-object Definitions'

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

Appendix A 'Questions and Answers'

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

Glossary

The Glossary contains definitions of terms used within this Standard.

Index

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 (e.g., *MetaAttribute*, *AttributeDerivation*, *IsDrawnUsing*, *IsOptional*)

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.

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
- AttributableMetaObject Hierarchy
- MetaObject Summaries

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

Included in the Subject Area Overview are one or more diagrams. These diagrams are 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 *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 *Meta-entity B* in Figure 2.

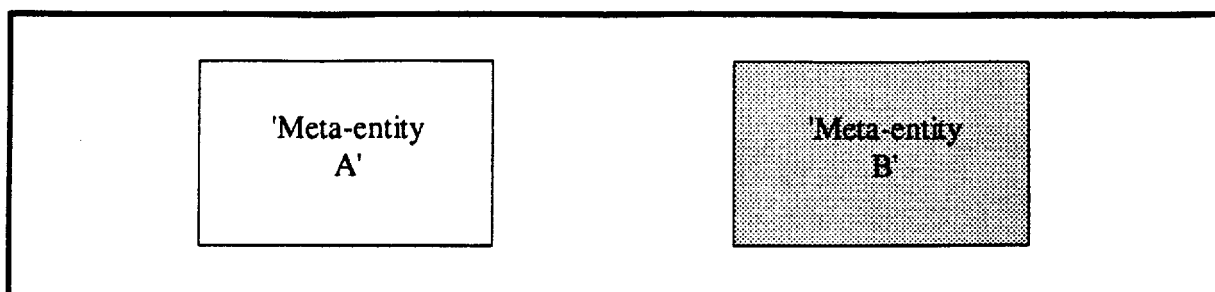


Figure 2
Conventions for Representing Meta-entities

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. **Meta-relationship A** in Figure 3 is an example of this. Additionally, two special notations may be used to represent meta-relationships on diagrams of meta-models.

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 **Meta-relationship B** in Figure 3.

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 **Meta-relationship C** in Figure 3.

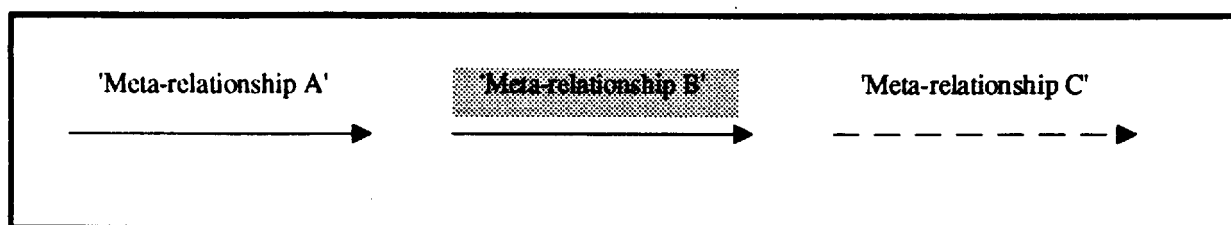


Figure 3
Conventions for Representing Meta-relationships

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 will be shown in *italics*.

3.2.5. **Meta-object Summaries**

A summary of the AttributableMetaObject *RootObject* is given first. Summaries are then given of all the meta-entities, followed by all the meta-relationships used in the Subject Area. The definitions are given in alphabetical order within each meta-object type.

For *RootObject*, the local meta-attributes are listed alphabetically and the optionality of each meta-attribute (mandatory or optional) is given.

For each meta-entity used in the subject area all the meta-attributes 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 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.