

ANNEX H. NAMING CONVENTIONS AND CLASS WORDS

H1 Introduction

H1.1 Purpose

The purpose of a naming convention is to provide a structured method by which standard names for data objects can be developed to support the construction of IDEF1X data models. The naming convention assumes the use of the English language. The procedures must cover the naming of the following IDEF1X conceptual objects:

- a. entities (independent and dependent entities as well as entity subtypes)
- b. attributes
- c. relationships.

H1.2 Guiding Principles

Readability. The naming convention should provide names that are completely comprehensible to the user. This means that even though a name conforms to a convention and may suffer some awkwardness in word flow, it must be readable to the user. The user must be able to derive the basic meaning of the data object by looking at the name. This is particularly important to assist validation of the IDEF1X data models by subject matter experts.

Brevity. Names should be as short as possible while still retaining meaning and uniqueness within the data model. Conflicts between brevity and clarity should always be resolved in favour of clarity.

Syntax. Each name must be constructed according to the syntax of the naming convention.

Context. Data objects are named based on their context within the data model and not according to any physical characteristics.

H2 Keywords Used to Construct the Syntax of a Name

The syntax of the naming convention is defined using three different types of keyword. These are defined below:

- a. Prime Word (PW). A Prime Word is a noun, which is used to represent the data grouping (entity) to which the data object belongs.
- b. Class Word (CW). A Class Word is used to specify the type of information contained in a set of data values.
- c. Modifier (M). A Modifier is used to refine, describe or render a name unique if this cannot be achieved by a Class Word or Prime Word alone.

In the subsequent specification of syntax, < > is used to delimit keywords, and [] is used to denote the optionality of a component word.

H3 Entity Names

H3.1 Syntax for an Entity Name (Independent and Dependent Entities)

A Prime Term, as defined below, is used to name independent and dependent entities. A Prime Term consists of a Prime Word (PW) that may be further modified to construct a name that is representative of the entity and its context within the data model. The syntax of a Prime Term is:

Prime Term = <PW> [<M>] ... [<M>]

Example: <CANDIDATE-TARGET-LIST >-<ASSOCIATION>

It is recommended but not required that the Prime Word should be the *first* keyword within the Prime Term for the following reasons:

- a. Its position in the Prime Term is always known, providing ease of reference.
- b. This approach is consistent with the way that the military traditionally classify objects by placing the major concept *first*.

H3.2 Syntax for a Category Entity (Entity Subtype)

In the case of a Category Entity (Entity Subtype) the syntax is extended to allow optional modifiers before the Prime Word. The syntax of the Category Entity Prime Term is:

Entity Subtype Prime Term = [<M>]... [<M>] <PW> [<M>]... [<M>]

Example: <PRIVATE-SECTOR>-<ORGANISATION-TYPE>

This syntax may only be used when the Prime Word is the same as that at the Entity Supertype level.

H3.3 Rules for Naming Entities

- a. The sequence of words within the Prime Term will conform to the syntax specified in Section H3.1. The Prime Word will always be the first word within the name.
- b. Prime Words can also be used as Modifiers within an Entity Name.
- c. A Prime Word must be a noun or sequence of nouns. Where more than one word is required to accurately name an independent entity, the combination of these words may then be regarded as the Prime Word. For example, OBJECT-ITEM and OBJECT-TYPE may be regarded as instances of Prime Words.
- d. A Prime Word must not be contained in the list of reserved Class Words.
- e. Plurals of Prime Words or Modifiers are not permitted.
- f. The Prime Word will often be the name of an independent entity within the Data Model. In some cases, the Prime Word may be the name of a subtype in a category hierarchy (e.g., UNIT as a subtype of ORGANISATION; FEATURE and ORGANISATION as subtypes of OBJECT-ITEM).
- g. A Modifier is an adjective or noun that is used to further refine or describe a Prime Word in order to name an entity.
- h. The use of abbreviations or acronyms shall be avoided.

- i. Only the International Reference Alphabet characters (A-Z) are permitted within a Prime Word or Modifier. Numbers are not permitted unless they form an integral part of a “Real World” entity name. For instance, “ADATP-3-ELEMENT” is permitted, while names such as “TEST3” are not. Special characters are not permitted.
- j. Each word of a Prime Term is separated by a hyphen ("-").
- k. Prepositions (at, by, from, in, to, of) are not permitted within a Prime Term.
- l. Articles (a, an, the) are not permitted within a Prime Term.
- m. Conjunctions (and, or, but) are not permitted within a Prime Term.
- n. Verbs are not permitted within a Prime Term.
- o. Gerunds (words ending in "ing") are permitted to be used as Modifiers.
- p. Sufficient modifiers will be used to adequately describe the concept.
- q. The entity name should appear in capital letters on all IDEF1X diagrams.
- r. In principle there is no limit on the length of the name provided that it is consistent with the specified syntax. However, see the implementation restrictions relating to the supporting IRD Dictionary in Section H6.
- s. Where the Entity Name contains more than one Prime Word (Prime Words being used as modifiers), the actual choice of Prime Word within the syntax should be chosen such that the concept being modelled is clearly described. In most instances, the Prime Word will describe the major concept represented by the Entity.
- t. When naming non-subtype-children, where possible, the Entity Name of a child (other than a subtype) should contain the Prime Word (or entire Prime Term) of the entity name(s) of its parent(s). See Rule H3.4(c).

H3.4 Additional Rules for Naming Categorisation Entities (Entity Subtypes)

- a. The sequence of words within the Prime Term will conform to the syntax specified in Section H3.2.
- b. The modifiers before the Prime Word are only to be used when it is agreed by that the concept being modelled cannot be adequately named using the normal syntax for a Prime Term (Section H3.1).
- c. It is not mandatory to migrate the Prime Word from the Generalisation Entity (Entity Supertype) to the related Category Entities (Entity Subtypes).
- d. Rules (b) to (t), as specified in Section H3.3, apply.

H4 Attribute Names

H4.1 Syntax for an Attribute Name

H4.1.1 The attribute name will consist of two distinct component terms; the prime term and the generic term, in which the Prime Term occurs first and the Generic Term is juxtaposed at (i.e., added to) the end of the Prime Term.

Attribute Name = Prime Term + Generic Term

H4.1.2 The Prime Term is the same as that defined for naming entities in Section H3. It will be the name of the parent entity of the attribute being named. A key attribute, which is migrated within an IDEF1X Data Model, may be named in one of two ways

depending upon whether IDEF1X role-naming is used. If role-naming is not employed, then the attribute must maintain the full migrated name as it occurs in the parent:

Attribute Name = Name of Parent Entity + Generic Term

Example: electronic-equipment-type- + category-code

H4.1.3 Where IDEF1X role-naming is used, the attribute name shall be constructed according to the following structure:

Attribute Name = Name of Host Entity + Role-named Generic Term

where the role-named generic term conforms to the rules for the construction of a Generic Term. It is desired (but not mandatory) that the role-named generic term end in the identical generic term used by the attribute in the parent entity. Example: reporting-data-

relative-timing- + reference-action-task-id

In the example first part is the name of the host entity and the second is the foreign key “action-task-id” with “reference” as a modifier to create the role-named Generic Term.

H4.1.4 The Generic Term identifies the set of values that can be associated with the Prime Term. The syntax of the Generic Term is:

Generic Term = [<M>].....[<M>] < CW>

Example: <category-><code>

H4.1.5 To distinguish attribute names from entity names, attribute names are written in lower-case characters with their words separated by hyphens.

H4.2 Rules for Naming Attributes

- a. The Prime Term will be constructed according to the rules and syntax defined for naming entities specified in Section H3.
- b. The Generic Term will be constructed according to the syntax defined above.
- c. Class Words will be reserved; and will not be used as a Prime Word. Use of Class Words as Prime Word modifiers should be avoided.
- d. All Class Words used must be from the authorised Class Word vocabulary. A list of Class Words that applies to the JC3IEDM is contained in Section H7.
- e. A Class Word must be a noun.
- f. Plurals of Class Words or Modifiers are not permitted.
- g. A Modifier is an adjective or noun that is used to further refine or describe the Generic Term.
- h. Abbreviations or acronyms should not be used within the Generic Term. (See rule x)
- i. Only International Reference Alphabet characters (a-z) are permitted within a Class Word or Modifier. Numbers and special characters are not permitted.
- j. Each word of the attribute name is separated from the next by a hyphen ("-").
- k. Prepositions (at, by, from, in, of, to) are not permitted within an attribute name unless the attribute name is a recognised fixed term considered as one word e.g. “type-of-coverage-code”, “time-of-arrival”, “method-of-control”, “unit-of-measure”.

- l. Articles (a, an, the) are not permitted within an attribute name.
- m. Conjunctions (and, or, but) are not permitted within an attribute name.
- n. Verbs are not permitted within an attribute name.
- o. Gerunds are permitted to be used as Modifiers.
- p. Sufficient modifiers will be used to adequately describe the Generic Term and make it readable.
- q. Each attribute name will contain at least one and only one Class Word (use of additional class words should be avoided).
- r. Prime Words may be used as Modifiers within the Generic Term.
- s. Plurals of Class Words or Modifiers are not permitted in the construction of the generic term.
- t. A unit of measure suffix will not be applied within the Generic Term. Unit of measure should be defined within the definition of the attribute or its associated domain and not as part of its name.
- u. The use of JC3IEDM generic terms will be controlled to ensure consistency of approach to naming.
- v. Attribute names will be displayed on IDEF1X diagrams in lower case text.
- w. Use of abbreviations is to assist in the formulation of shortened physical names. Special dispensation has been given for the demonstration data modelling to allow "id" to be used instead of "identifier".

H4.3 Rules for Defining Attributes

Data attributes are defined based on their origin. If an attribute migrates to a child entity the definition will change based on the role the attribute plays in the receiving entity.

H5 Relationship Names

H5.1 Syntax for Relationship Names

The syntax for describing relationships within an IDEF1X Data Model is:

<parent-child relationship> / <child-parent relationship>

Example: <identifies-the-source-for>/<is-referenced-to>

The IDEF1X diagram places the relationship in context with its parent and child entities. A parent-child relationship identifies the relationship between the parent entity and the child entity. The child-parent relationship identifies the relationship between the child entity and the parent entity. The parent-child verb phrase is sometimes termed the "relationship verb phrase." The child-parent verb phrase is referred to as the "inverse verb phrase."

H5.2 Rules for Relationship Names

The following rules should be followed in constructing both the parent-child and child-parent relationship names:

- a. Both the parent-child and child-parent relationship will consist of a verb phrase.

- b. The verb phrases must be meaningful so that they represent business rules that can be verified by the user community. For example, the use of words such as: "has", "uses", "relates to" and "does" indicates a weak relationship, which should be rationalised within the Data Model.
- c. Where a dependent entity is used purely to resolve a many-to-many relationship (termed an associative entity) the production of a <parent-child relationship>/<child-parent relationship> may not be meaningful. In this case a single verb phrase is assigned to each side of the associative entity; and the associative entity is read through.
- d. The verb phrases will be expressed in lower case characters.
- e. Hyphens will be used as the separator between words. Spaces are not permitted.
- f. The maximum length of the “verb phrase” and “inverse verb phrase” including hyphens are both restricted to 60 characters.

H6 IRD Implementation Restrictions

In order to implement an IRD efficiently, it desirable to specify maximum lengths for the various components of the naming convention. These have been chosen so as not to be restrictive to the application of the naming convention. The maximum lengths are shown in Table H-1.

Table H-1. Implementation Restrictions on Name Lengths

Component	Maximum Length (Chars)
Class Word	16
Prime Word	80
Attribute Name	160
Generic Term	80
Entity Name	80
Verb Phrase Name	60
Inverse Verb Phrase Name	60

H7 List of Reserved Class Words

This section contains the specification of class words that are used in the data model. The approved Class Word abbreviation is shown in parentheses after the Class Word name

Domain Name	amount (amt)
Definition	A number of monetary units specified in a currency where the unit of currency is explicit or implied.
Source of Definition	ISO/TS 15000-5:2005
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	Unbounded
High Value	Unbounded
Definition Prefix	“The monetary numeric value that represents...”

Domain Name	angle (angle)
Definition	The rotational measurement between two lines and/or planes diverging from a common point and/or line. This measurement will be expressed in units of degrees.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	0
High Value	Unbounded
Definition Prefix	“The rotational measurement...”

Domain Name	binary-object (binobj)
Definition	A set of finite-length sequences of binary octets. (Note: This Representation Term shall also be used for Data Types representing graphics (i.e. diagram, graph, mathematical curves, or similar representation), pictures (i.e. visual representation of a person, object, or scene), sound, video, etc.)
Source of Definition	ISO/TS 15000-5:2005
Data Type	Binary Object. Type
Low Value	Not applicable
High Value	Not applicable
Definition Prefix	“A binary object assigned to...”

Domain Name	code (code)
Definition	A character string (letters, figures or symbols) that for brevity and/or language independence may be used to represent or replace a definitive value or text of a property. This class word is used only when there is a limited set of possible values.
Source of Definition	Adapted ISO/TS15000-5:2005
Data Type	VARCHAR
Low Value	Not applicable
High Value	Not applicable
Definition Prefix	“The specific value that represents...”

Domain Name	coordinate (coord)
Definition	The geodetic designation for the location of a point using a polar coordinate system where the radius is defined through the geoid. This will be expressed in degrees, with positive values measured eastward from the zero meridian or northward from the equator.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	-180
High Value	180
Definition Prefix	“The numeric value that represents...”

Domain Name	count (cnt)
Definition	A counted number of non-monetary units. Counts need to be specified with a unit of the count. (Note: This Representation Term shall also be used for counted coefficients.
Source of Definition	Adapted from quantity in ISO/TS15000-5:2005
Data Type	NUMBER (Decimals not allowed)
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	“The integer value representing...”

Domain Name	datetime (dtm)
Definition	A designation of a specified chronological point measured using Coordinated Universal Time (UTC) ISO 8601:2000 as a standard of reference, constrained to "zero meridian" i.e. ‘Zulu’ time zone only. This is expressed as a composite field using a compacted ISO notation YYYYMMDDhhmmss.sss where YYYY represents a year in values from 0000 to 9999, MM represents a month in values from 00 to 12, and DD represents a day in values from 00 to 31, hh represents an hour in values from 00 to 23, mm represents a minute in values from 00 to 59, and ss.sss represents the number of seconds and milliseconds in values from 00.000 to 59.999. Note: All character positions must be filled.
Source of Definition	ISO/TS15000-5:2005
Data Type	CHAR
Low Value	Not applicable
High Value	Not applicable
Definition Prefix	“The character string representing a point in time that designates...”

Domain Name	dimension (dim)
Definition	A one-dimensional linear distance measure. This will be expressed in metres
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	“The one-dimensional linear distance representing...”

Domain Name	duration (dur)
Definition	A numeric value that represents a quantity of time expressed as milliseconds. An optional preceding minus sign ('-') is allowed, to indicate a negative duration. If the sign is omitted a positive duration is indicated.
Source of Definition	MIP derived ISO 31-1 and ISO-8601
Data Type	NUMBER
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	“The numeric value that represents a quantity of time in milliseconds ...”

Domain Name	identifier (id)
Definition	A character string used to establish the identity of, and distinguish uniquely, one instance of an object within an identification scheme from all other objects within the same scheme.
Source of Definition	Adapted ISO/TS15000-5:2005
Data Type	NUMBER (Decimals not allowed)
Low Value	Determined by key management rules
High Value	Determined by key management rules
Definition Prefix	“The unique value, or set of characters, assigned to represent a specific <entity> and to distinguish it from all other <entity>s.”

Domain Name	index (ix)
Definition	A sequence of one or more numbers, alphabetic characters and/or special characters that serve to uniquely identify some object but have no readily definable meaning. (Index enables the distinction of instances in associative entities that would otherwise be identical because the values of the other key attributes (which are all foreign-key attributes) are the same).
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals not allowed)
Low Value	Determined by key management rules
High Value	Determined by key management rules
Definition Prefix	“The unique value, or set of characters, assigned to represents a specific...”

Domain Name	ordinal (ord)
Definition	A number designating the place (as first, second, third, etc.) occupied by an item in an ordered sequence. Units are not applicable. Note: Class word ordinal is not to be used where class word index applies.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals not allowed)
Low Value	1
High Value	Unbounded
Definition Prefix	“The integer value that indicates...”

Domain Name	quantity (qty)
Definition	A numeric value that denotes a measure of the physical property of an object. Class word <i>quantity</i> has a fixed unit of measure that must be specified on an attribute-by-attribute basis. Class word <i>quantity</i> is not to be used where class words <i>angle</i> , <i>coordinate</i> , <i>count</i> , <i>dimension</i> , and <i>rate</i> apply.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	The numeric value that represents...”

Domain Name	rate (rate)
Definition	A numeric value that denotes a physical property of an object expressed as a proportion of a physical property with respect to a unit of time. The unit of measure for class word rate must be specified on an attribute-by-attribute basis.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	“The numeric value that denotes...expressed as <A> per .”

Domain Name	ratio (rat)
Definition	A numeric value representing the quotient of two values that have the same unit of measurement, i.e., ratio has no units of measure. May be used to express a percentage. The allowable range must be specified on an attribute-by-attribute basis.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	Unbounded (may be negative)
High Value	Unbounded
Definition Prefix	“The numeric quotient value that represents...”

Domain Name	temperature (tmpr)
Definition	A measure of degree of hotness or coldness in an object or in space. This will be expressed in degrees Celsius.
Source of Definition	MIP-NDAG
Data Type	NUMBER (Decimals allowed) The "decimal separator" must be a period (.). The use of scientific notation is not allowed for exchange.
Low Value	-273.15
High Value	Unbounded
Definition Prefix	“The numeric value that indicates...”

Domain Name	text (txt)
Definition	A character string (i.e. a finite set of characters) generally in the form of words of a language. This embraces notions such as description, name, comment etc.
Source of Definition	ISO/TS 15000-5:2005
Data Type	VARCHAR
Low Value	Not applicable
High Value	Not applicable
Definition Prefix	“The character string assigned to represent...”