ENTITY RELATIONSHIP MODELING STANDARDS AND GUIDELINES

Information Systems Branch | Economy Sector

Version 2.0.1
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REVISION HISTORY

Date	Version	Author	Description
2017-08-10	2.0.0	Maureen Bird	Pulled ER modeling information from CS_TSA_Designer10g_Standards_and_Guidelines document. Incorporated into new document standard template, removing Oracle Designer focus. Functional Modeling and Business Process Modeling not included in this version.
2017-08-21	2.0.1	Maureen Bird	Updating Deliverables section to include toolsets and timelines. Incorporating section for Conceptual Data Modeling.

1 INTRODUCTION

This document describes the guidelines and standards to be followed when designing and developing applications for the Economy Sector of the Province of British Columbia. At time of writing, the Economy Sector consists of the Ministry of Jobs, Trade & Technology, Ministry of Labour, Ministry of Municipal Affairs & Housing, and Ministry of Tourism, Arts & Culture.

Originally the Oracle Designer standards for the Ministry of Sustainable Resource Management, this document has been taken, with permission from that Ministry, and modified to suit our Sector's unique requirements. While the standards originally spoke to modeling within Oracle Designer, this adapted version is intended to be tool agnostic. Where a deliverable (or method of delivery) is Oracle Designer-specific, it will be specified.

As with any standards document, this document will evolve over time. It is fully expected that each and every development effort will contribute to the evolution of this document.

1.1 TARGET AUDIENCE

This document is directed at those who will be designing, developing, and maintaining application systems for the Economy Sector. This includes external contractors, consultants, and business partners, as well as ministry employees (Data Administrator, Database Administrator, Business Analyst and Application Analysts).

1.2 PURPOSE

This document outlines the entity relationship modeling standards which must be followed at both conceptual and logical levels when building application systems for the Economy Sector.

1.3 ASSUMPTIONS

As it is not the intent of this document to be an 'all inclusive' guide, it is assumed that the audience has a working knowledge of relational databases.

Throughout the remainder of the document, the ministries represented by the Economy Sector shall be referred to as "The Ministry".

2 SECURITY ACCESS POLICY

Audience: ISB Staff, External Contractors, Clients

The Data and Database Administration Group within the Ministry Information Systems Branch (ISB) is ultimately responsible for the management, data integrity, and security of the ministry's data repositories. Due to the inherent complexities and risks associated with managing metadata within any SCM environment and repositories, the ISB will restrict "Create/Update/Delete" access only to specific external development resources and select ISB staff. "Read only" access may be provided to other individuals in the ministry if deemed necessary on a case-by-case basis. This policy will be firmly enforced by the ISB.

3 DEFINITIONS

3.1 GUIDELINE

A guideline is a method or custom, which through common usage has become an accepted method of work. A guideline is not enforced, and is not a standard.

3.2 STANDARD

A standard is a specific statement of the rules and constraints governing the naming, contents, and operations of software. Some statements are in bold, to emphasize standards that have been overlooked in the past.

Unless otherwise noted, every statement in this document is a standard.

3.3 APPLICATION NAMING

Applications must be named as a 3-4 character short name or acronym that is unique within the business area or corporation. The expanded name should be recorded in the Title property.

When developing an Oracle database, this Application Name will be automatically prefixed to all 'physical' database objects such as tables, views, packages, sequences and roles (see Oracle Designer Database Design Transformer). Functions and procedures that are not encapsulated in packages should also be prefixed with this name.

The intent of requiring the prefixing of the Application Name on all objects is to reduce the possibility of namespace collisions in a shared database environment. For example,

the LGIS application uses LGIS as its short name. Therefore, the SCHEDULE entity becomes the LGIS_SCHEDULES table.

Approval to use a new application acronym must be obtained from the Corporate Data Administrator or Corporate Database Administrator to ensure that there are no duplicate names.

4 General Guidelines

This section presents some overall guidelines to be considered in entity relationship modeling for the Ministry.

4.1 Referencing Objects in Text Descriptions

Whenever the name of another ENTITY, ATTRIBUTE (or any other object) is used within a textual description, it should be capitalized for easier reading (and reference).

For example, if LICENCE is an entity, then the following description should be used for the LICENCE_TYPE entity:

"This entity identifies the types of LICENCES that are available to the polling system"

5 Entity Relationship Modeling

Entity Relationship Modeling involves identifying the things of importance in an organization (entities), the properties of those things (attributes), and how they relate to one another (relationships).

It is the intention of Entity Relationship Modeling to produce a data model of the business requirements, not the physical implementation.

5.1 Objectives

The objectives of the Entity Relationship Modeling process are:

- To provide an accurate model of the information needs of the organization, that will act as a framework for the development of new or enhanced systems. The model may be at a conceptual or logical level.

- To document the business requirements for data, the specific business rules, and the relationships that apply to that data.
- To produce a model independent of any data storage and access method, to allow objective decisions to be made about implementation techniques and coexistence with existing systems.
- To provide a blueprint for data storage that ensures data integrity and reduces data redundancy.

It is a Ministry standard that the Entity Relationship Model is in Third Normal form (e.g. no non-UID attribute can be dependent upon another non-UID attribute).

Note that Ministry Quality Assurance reviews will reference the Data Modeling standards found on the Government of British Columbia's IM/IT Standards – Data Administration Standard.

5.2 DELIVERABLES

The ERD document to be presented for approval must consist of:

- Entity Relationship Diagram(s) (ERDs, includes conceptual or logical)
- supporting data dictionary

The remainder of this document describes the level of detail required in the ERD and in the data dictionary.

Oracle Designer deliverables consist of:

- Entity Relationship Diagram (conceptual, logical)
- System Glossary Report (conceptual, logical)
- Entity Definition Report (conceptual, logical)
- Entities and Their Attributes Report (logical)

The following additional Designer deliverables may also be provided. This does not preclude the use of the various analytical and quality assurance reports during the design, development, and review of the components of an application.

- Entity Completeness Checks Report (conceptual, logical)
- Domain Definition Report (logical)
- Attributes In a Domain Report (logical)

5.2.1 Deliverable toolsets

It is highly recommended to use a data modeling tool (e.g. Oracle Designer, Oracle SQL Developer Data Modeller, ERWin Data Modeller) to produce the required ERD and data dictionary. Other development tools (e.g. MS Visual Studio, MS Visio) may be used but

must be approved for use by the Ministry. The goal is to produce an ERD and data dictionary that is clear, easy to understand, descriptive, and that can be readily updated.

5.2.2 Deliverable timelines

Timing of the ERD and data dictionary delivery (new or updated) depends on project timelines and on the development methodology being used for the project. Regardless of the methodology used, deliverables must be checked into the Ministry's SCM repository and be available for review by Ministry ISB staff as per the project's timelines.

5.3 CONCEPTUAL DATA MODEL (CDM)

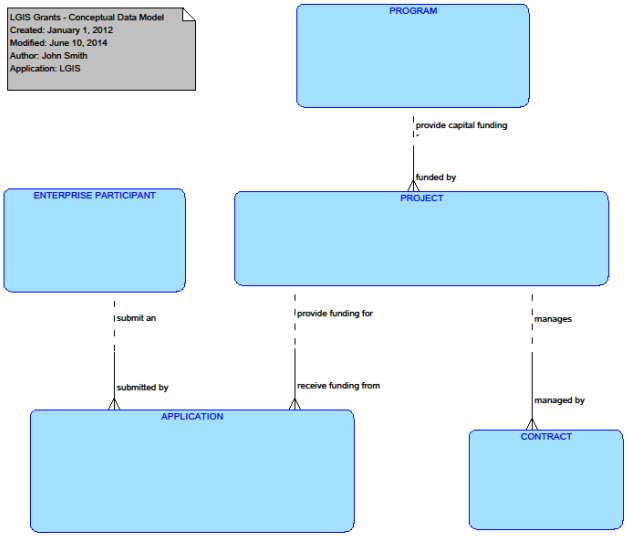
This section describes expectations for the Conceptual Data Model (CDM).
During requirements-gathering stages of a development life cycle, the CDM provides a basis for agreement on the major entities and their relationships to one another, and is used as a tool for organizing and validating requirements.

The CDM consists of high-level data entities (and their primary relationships) (data model) along with written descriptions of the entities (data dictionary). The model does not require attribute-level details nor does it require many-to-many relationships to be resolved.

5.3.1 Diagramming

To facilitate readability, the CDM may be broken down into Subject Area models.

- A subject area model should consist of no more than 10-15 entities per subject area.
- Each CDM should include a diagram summary that includes information such as:
  - Title
  - Date & Time Created
  - Date & Time Last Modified
  - Author
  - Name of application



5.3.2 Entities

Entity names included on the CDM must be:

- Meaningful
- Self-documenting – the reader should be able to tell what the entity is capturing without reading the description
- Singular
- Derived from business use or purpose

The CDM must include written descriptions of each entity. These should describe the business information held by the entity, using plain English, and ensure that any terms and acronyms are defined. Examples are recommended, where possible, to provide clarification.

- Good Definition

```
PROJECT - This entity describes a capital PROJECT for which an ENTERPRISE
PARTICIPANT (local government) has applied for funding. A PROJECT is managed under
and funded by a Capital Grants PROGRAM.

EXAMPLE:
Silver City Water Treatment Upgrade
South East Sector Utility Extensions
Harbour Environmental Protection Program
```

- Bad Definition

```
PROJECT - A Capital Grants Project.
```

5.3.3 Attributes

The CDM does not require attribute-level details but some attributes may be included to assist or clarify understanding.

5.3.4 Relationships

- Every major entity appearing on a conceptual data model should have at least one relationship to another entity.
- The CDM must contain clearly-described relationships between entities. These relationships should be described for both ends of the relationship. If known, cardinality and optionality may be included to ensure understanding but is not required.
  If cardinality and optionality are included, the relationships must be written such that it can be read as "*Each ENTITY1 must be/may be RELATIONSHIP one and only one/one or more ENTITY2"*, e.g. Each PROGRAM may provide capital funding for one or more PROJECTs / Each PROJECT must be funded by one and only one PROGRAM.

5.4 Logical Data Model (LDM)

This section describes the standards and guidelines related to the Logical Data Model (LDM). The level of detail expected at the logical level is greater than at the conceptual level since, by this point, the requirements are understood to a greater detail, and the design has taken shape.

5.4.1 Diagramming

5.4.1.1 Master ERD

The Master ERD provides context to a system by presenting a total view of all system entities and their relationships. To facilitate readability and ease of printing, the detailed entity information is presented in Subject Area ERDs.

The Master ERD must contain:

- entities with only the Primary UID attributes. The entities from specific Subject Areas must be colour coded to indicate their origin. The colour code for entities from each Subject Area must be consistent among all diagrams within a system. This requirement provides effective visual communication of each Subject Area in context of the system.
- Diagram Summary Information
- a legend describing the colour code for each set of Subject Area entities
- all of the relationships with their descriptions.

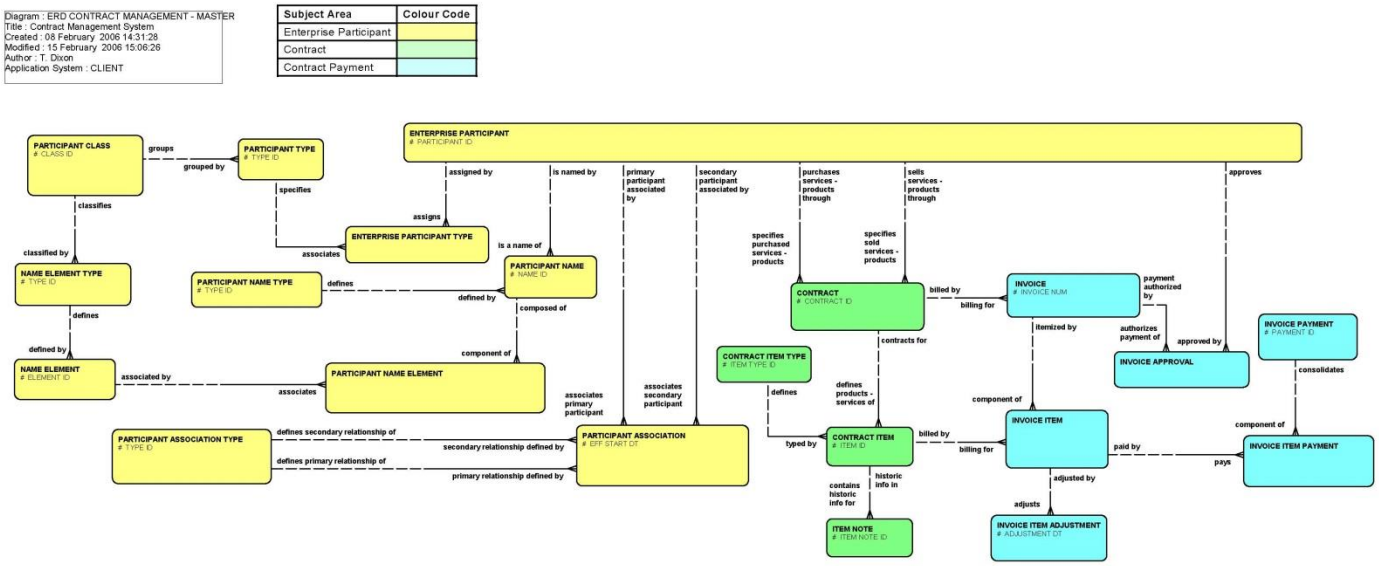


Figure 1 - Master ERD Example composed of colour-coded Subject Areas entities with the Primary UIDs

5.4.1.2 Subject Area ERDs

The Subject Area ERDs provide the required detailed information of all the entities in the system pertaining to a specific business function (e.g. contract payments).

To facilitate readability and ease of printing, a Subject Area ERD must not exceed 15 entities. If there is a business requirement to exceed this maximum, it must first be reviewed and approved by the Ministry DA.

The Subject Area ERD must contain the following:

- entities with all of the attributes including Primary UIDs and Mandatory and Optional attribute indicator symbols
- entities depicted in the diagram must be white in colour. Key entities from external Subject Areas, which are included to provide context to the Subject Area diagram, must be colour coded to indicate their origin. The colour code for these key entities must be consistent among all diagrams within the system.
- a legend describing the colour code for each set of external Subject Area entities
- all of the relationships with their descriptions.

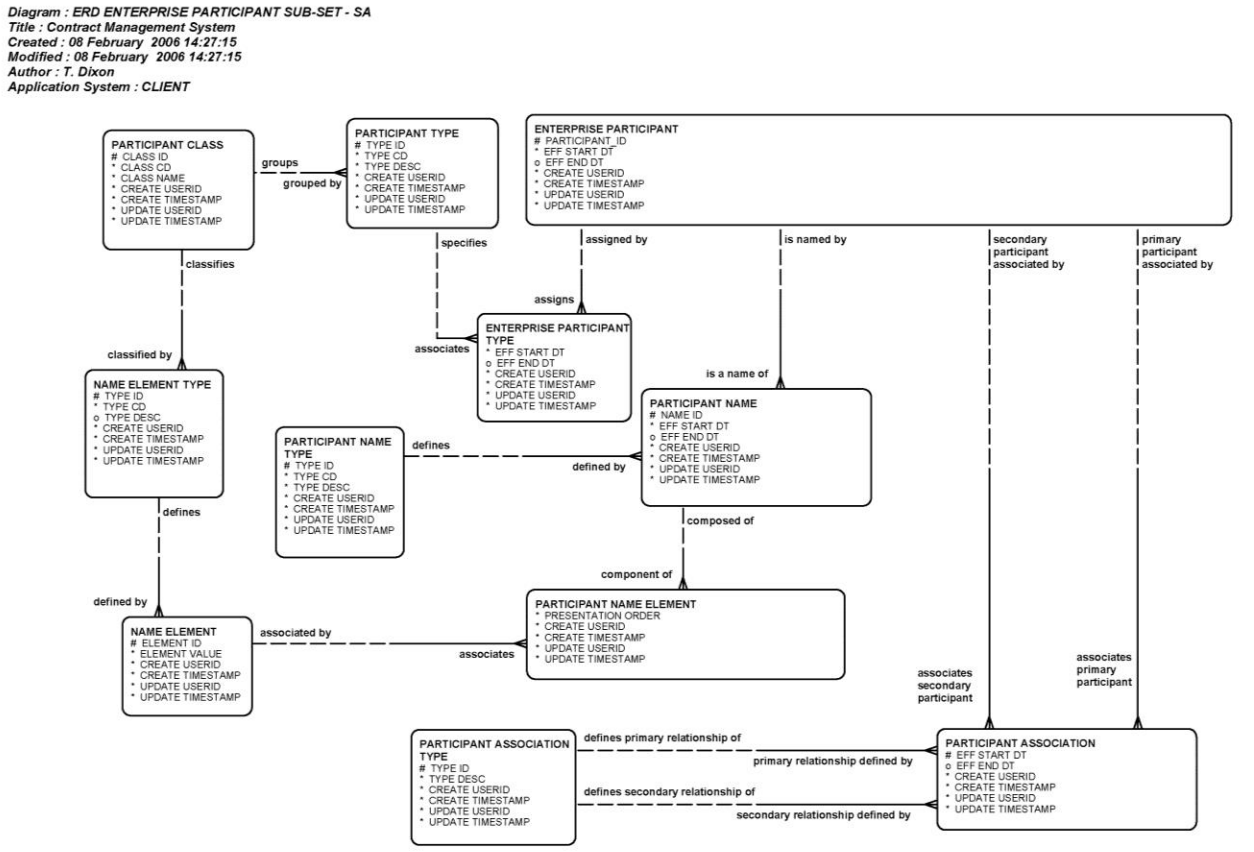


Figure 2 - Subject Area ERD Example – no external Subject Area entities

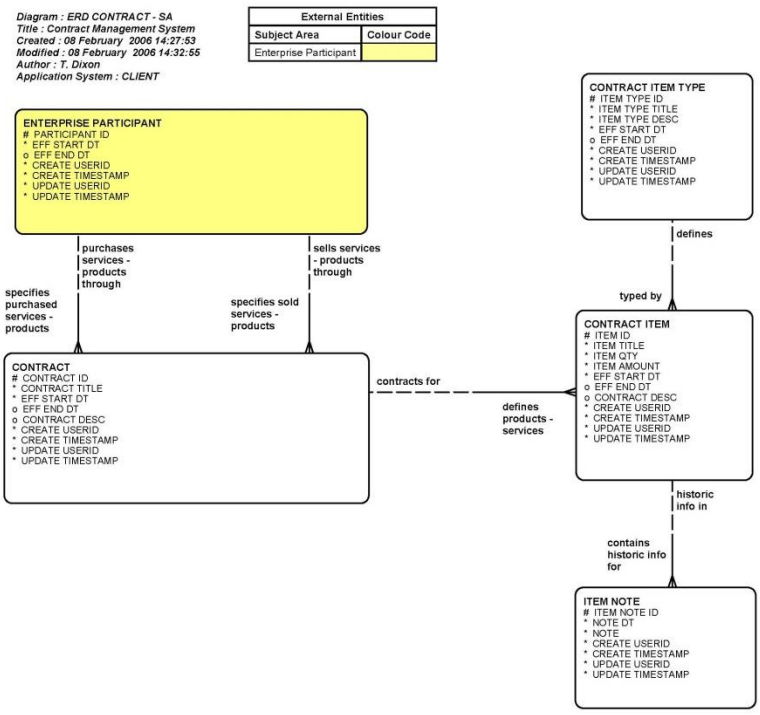


Figure 3 - Subject Area ERD Example – with external "Enterprise Participant" Subject Area entity

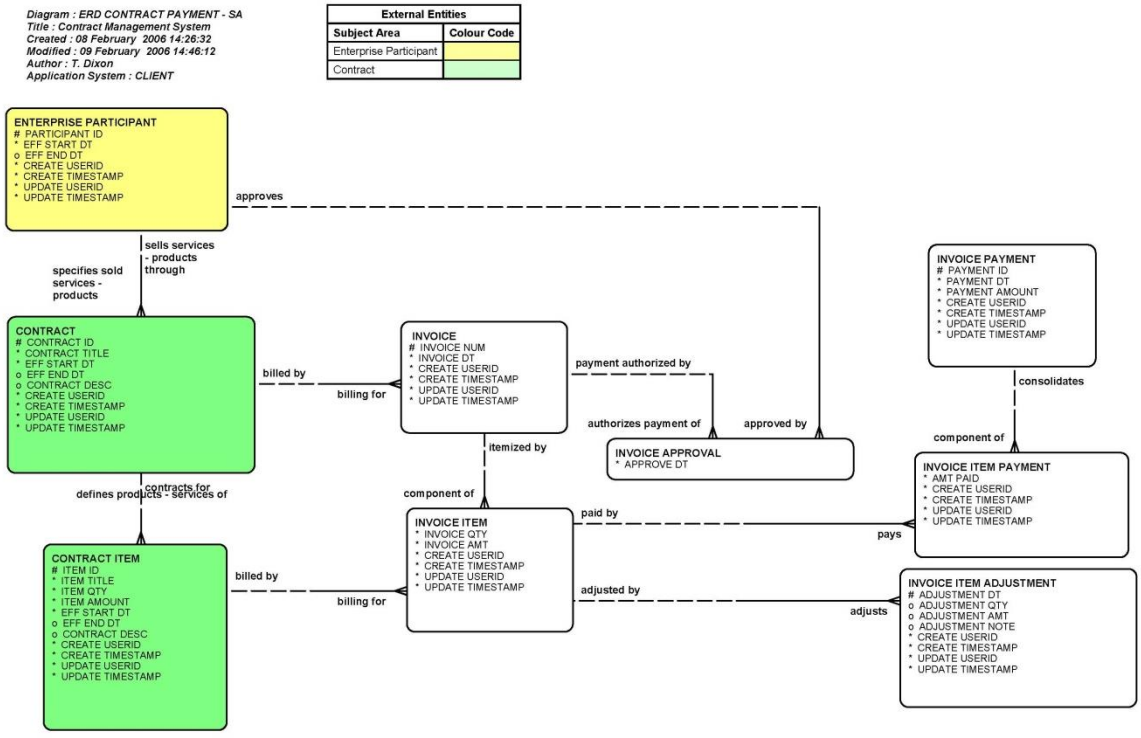


Figure 4 - Subject Area ERD Example - with external "Enterprise Participant" and "Contract" Subject Areas entities

5.4.1.3 ERD Naming Conventions

The ERD naming conventions are as follows:

- The term **"ERD"** must precede each diagram name
- If it's a Master ERD, then **"- Master"** must follow each name (e.g. **ERD Contract Management – Master**)
- If it's a Subject Area ERD, then **"- SA"** must follow each name (e.g. **ERD Contract – SA**)

5.4.1.4 Diagramming Style

Each ERD must contain the **Diagram Summary Information** displayed without borders.

The Diagram Summary Information must contain:

- Diagram name (see ERD Naming Conventions)
- Title (which could be the Application System name if the Container name is not explicit e.g. "Contract Management System" ERD in the "CLIENT" container)
- Date and time the diagram was created
- Date and time the diagram was last modified
- Author
- Application Name (see Application Name)

The recommended style is to place master (Independent) entities above the detail (Dependent) entities they are related to. When using this style, all relationships are drawn with the *many* end of *one–to–many* relationships appearing at the bottom of the relationship line and to the right. Using a consistent style improves the readability of the diagram and makes it much easier to identify potential problems in the model.

5.4.2 ERD Visual Check List

A visual check of the ERD includes the following items:

- Diagram Summary Information including:
  - Diagram Name in the format defined above
  - Title,
  - Date & Time Created,
  - Date & Time Last Modified,
  - Author,
  - Application System
- Entity boxes line up, and relationship lines are mainly straight and horizontal or vertical (*many* end at bottom or right of relationship line)
- The relationship names are easy to read. This implies that the names are:
  - horizontally orientated

    - on opposite sides of the lines next to the entity to which they refer such that they may be read in a clockwise fashion
    - not overlapping.
- All text is unambiguous - jargon and abbreviations have been avoided
- If colour is used to enhance the readability of an ERD, a legend describing the colour code for each set of subject area entities must be included in the diagram.
- The diagram must be presentable, with legible elements and minimal crossing lines.
- The diagram reflects the business accurately as validated by business users
- The diagram can be effectively used to describe data to all interested participants.

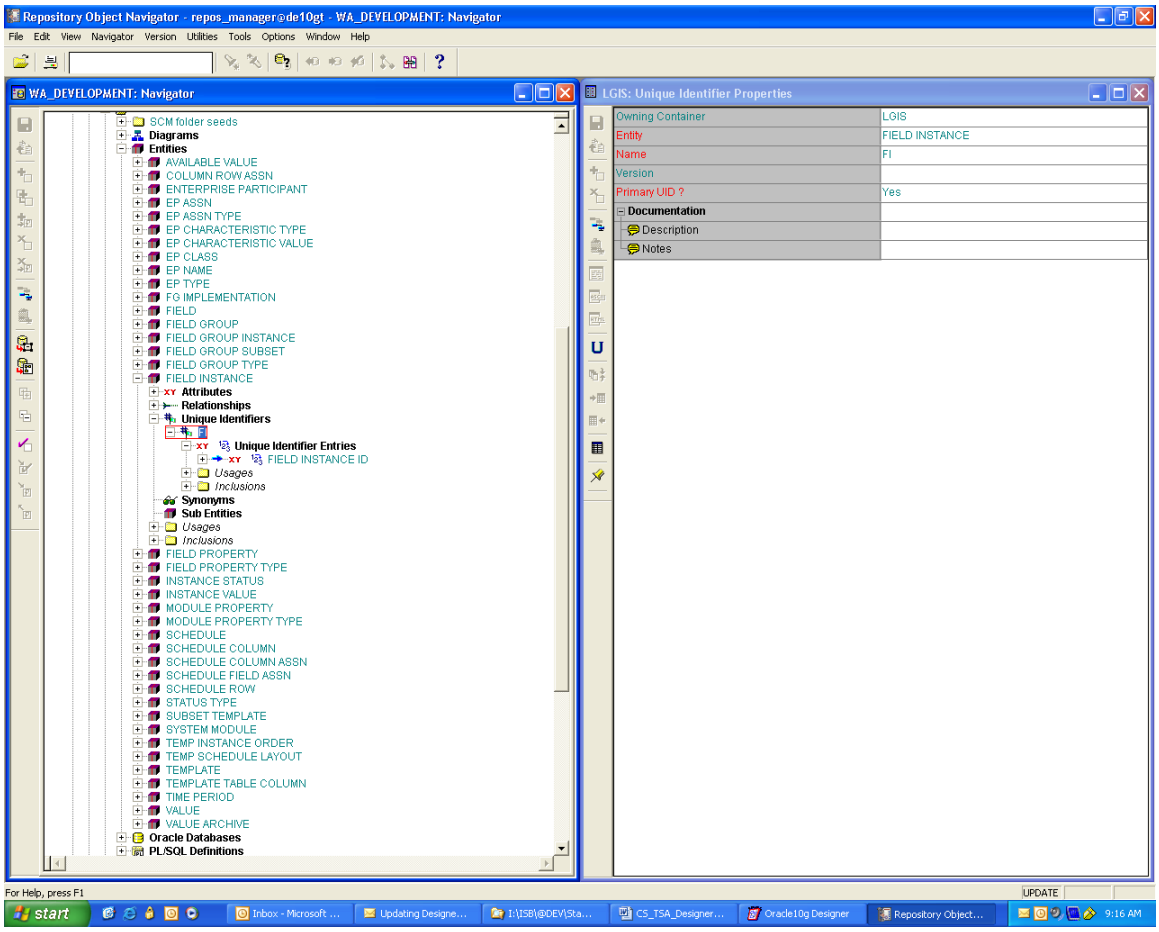
5.4.3 Entities

An entity is a thing of significance about which information needs to be known or held.

Property	Rule	Req?
Name	• Should uniquely identify the entity in a manner that is easily understood by the business people • should be made up of one to three real words, with no ambiguity in meaning • abbreviations should be avoided unless they are obvious • use a singular noun and any modifiers • contains only alphabetic characters and spaces • does not contain hyphens or underscores • when the entity name is only one word, it must not be an Oracle or SQL Server Reserved word Note: • cross-reference entity names must be suffixed with _XREF • code lookup entities must be suffixed with _CDS	Y
Short Name	• an entity identifier, up to 10 characters in length • when the entity short name is only one word, it must not be an Oracle or SQL Server Reserved word Note: In Oracle Designer, the *Entity Short Name* becomes the default *Table: Short Name* when Designer's Database Design Transformer is used.	Y
Plural	• should follow the standards for the Entity Name (no underscores, hyphens, etc) • there are cases where the name is already plural (e.g. SHEEP), so this must be corrected manually	Y

Property	Rule	Req?
	Note: In Oracle Designer, the *Entity Plural* becomes the default *Table: Name* when Designer's Database Design Transformer is used.	
Volumes	• These fields are the initial estimates for the quantity of data, and provide estimates for the annual growth in information. These data will eventually be used in the sizing estimate algorithm. Note: It is important that some thought, effort, and calculation be put into these estimates by actively soliciting this information from the business experts.	
Initial	• expected number of records in the entity (table) when the system first goes into production	Y
Maximum	• expected number of records in the entity (table) at the end of the third year	Y
Average	• average number of expected records in the entity (table) at the end of the third year	Y
Annual Growth Rate	• expected % growth rate for the entity (table) per year	Y
Documentation		
Description	• must explain what the entity is to non-application personnel • descriptions for abstract entities should contain concrete examples • can be further categorized into Definition, Example and Miscellaneous, such as: DEFINITION A type of role that a party may play in the context of a permit, PMP, license or certificate. EXAMPLE Examples of role types are 'Located Within' (i.e. Region or regions that the PMA, License or Certificate are physically located or affect in the case of items that cross regional boundaries), 'Administering Region' (i.e. the region actually responsible for a permit. PMP, License or certificate), 'Consultative' and 'Contact'. MISCELLANEOUS Note that Administering Region may include HQ, as HQ staff may perform the hands-on administration of a permit, PMP, license or certificate.	Y

Property	Rule	Req?
	This entity is used to hold the valid list of Approval Roles that are available for use in CRISP. This list is only to be modified by the Application Manager, and then, only when adding new functionality to the system. Recently, we've added 'Approved Training Agency', which will now share the duties of issuing Certificates with 'Administering Region' . Note: In Oracle Designer, the Database Design Transformer copies this information into the User / Help Text and Description fields.	
Notes	• should contain any notes about this entity • structured analysis or design comments should be placed here, for example: OUTSTANDING ISSUES ========== A! 1998-01-21 GW GENERAL LOCATION and all information specifically related to time/place details have been deleted (R. Adams, 1998-01-19) from EXAMINATION entity and the entire entity has been deleted. IMPLEMENTATION NOTES ========== MISCELLANEOUS ========== Note: In Oracle Designer, the Database Design Transformer copies this information into the Notes field.	N



5.4.3.1 Unique Identifiers

Node	Rule	Req?
Unique Identifiers	• must be comprised of attribute(s) and/or relationship(s) that are defined for the entity • this is to ensure business uniqueness Note: In Oracle Designer, although unique identifiers are usually entered via the Entity Relationship Diagrammer, they also show up in the RON, under the following sub-node.	Y
Primary UID?	• indicates that this UID is the primary key Note: UID's can be either a business key (with meaning, such as Name) or a system (a surrogate meaningless value, such as a number). When using System UID's, the underlying business keys are still recorded in Designer as Secondary UID's.	Y

5.4.4 Attributes

An attribute is a thing of significance that serves to classify, quantify, qualify, identify or express the state of an entity.

Property	Rule	Req?
Name	• should be made up of one to three real words • when an attribute name is only one word, it must not be an Oracle or SQL Server Reserved word • should be singular and contain no hyphens or underscores • if generating Oracle Forms modules, then the length should be 22 characters or less, due to a Forms Generator bug Note: In Oracle Designer, the Database Design Transformer uses this to generate the default Name and Prompt for the column.	Y
Sequence in Entity	• will become the sequence of the columns in the table (see Oracle Designer's Database Design Transformer) • optional attributes should be after mandatory ones • long character attributes should be next • large binary attributes (e.g. video, sound) should be next • audit attributes (create_userid, create_timestamp, etc.) must be last (see Standard Audit Attributes)	Y
Domain	• name of the domain (if a domain is used)	
Definition	• if a domain is not used, then the following fields must be completed to define the datatype • if a domain is used, then these fields will be populated automatically	
Format		Y
Average Length		Y
Maximum Length		Y
Decimal Places	• mandatory for numeric attributes	N
Optional?	• NO means that the attribute is required (Not null) • YES means that the attribute allows null values	Y
Units	• Used for documentation purposes only • Defined the unit of measure for the attribute (metres, kilograms, ppm)	N

Property	Rule	Req?
Default	• Should not be used if an attribute is optional • Must be the same datatype as the attribute Note: Use of defaults must be examined carefully, as default values may lead the inexperienced user to enter erroneous data	N
Derivation	• algorithm or expression how the attribute's value is derived • further explanation of this derivation must be qualified in the Attribute Notes property	N
Volumes	• These fields contain estimates for the quantity of data, and will eventually be used in the sizing estimate algorithm ***It is the Ministry standard to enter appropriate values for these fields.***	
Percent Used - Initial	• should be specified for documentation purposed • if an attribute is not optional, then will be set automatically at 100%	Y
Percent Used - Average	• if an attribute is not optional, then will be set automatically at 100% • specifies the average percent of the attributes that contain values	Y
Documentation		
Comment	• For example: `Indicator that a stay is currently on this approval` Note: In Oracle Designer, the Database Design Transformer uses this to generate the *Display: Hint* and *Comments* for the column.	Y
Description	• must be described from the user's perspective and in plain English • provide examples where possible • should further expand upon the attribute comment, for example: `A 'Stay' is an order issued by the Environmental Appeal Board, a temporarily suspending the approval, pending a decision on an appeal. This stay can affect only a certain portion on the approval.` Note: In Oracle Designer, the Database Design Transformer uses this field to populate the Text: Description and Text: User	Y

Property	Rule	Req?
	Help Text fields for the column.	
Notes	• any additional notes for the attribute	N

In Oracle Designer, although Allowable Values are usually entered via the Entity Relationship Diagrammer, they also show up in the RON, under the Allowable Values sub-node:

- where possible, defining allowable values should be done in a domain rather than explicitly in an attribute
- if this is not possible (i.e. the Database Design Transformer creates this list for discriminator columns in super-type implementations), allowable values can be defined for each attribute in this group

5.4.5 Standard Audit Attributes

It is the Ministry standard that the following audit attributes be added to all entities:

```
CREATE_USERID       not null   varchar2(30)
CREATE_TIMESTAMP    not null   date
UPDATE_USERID       not null   varchar2(30)
UPDATE_TIMESTAMP    not null   date
```

When implemented as columns in the table, these attributes allow a degree of simple security tracking, but can also be useful in tracing down problems.

5.4.6 Relationships

A relationship represents any significant way in which two entities can be associated.

Property	Rule	Req?
From		
Relationship Name	• relationship names must be meaningful • both sides of a relationship must be named • "catch all" phrases (related to, associated with) should be avoided in favour of more descriptive names Note: It is often helpful to consider the relationship name in the context of a sentence as follows: EACH *Entity1* MUST BE/MAY BE *relationship* ONE AND ONLY ONE/ONE OR MORE *Entity2* For example: EACH student MUST BE enrolled in ONE OR MORE	Y

Property	Rule	Req?
	classes, or EACH class MAY BE comprised of ONE OR MORE students	
Minimum Cardinality	• defines optionality of the relationship 0: MAY BE 1: MUST BE	Y
Maximum Cardinality	• mandatory in the sense that it must be considered • defines the degree of the relationship 1: ONE AND ONLY ONE null: ONE OR MORE	Y
Transferable	• mandatory in the sense that it must be considered • by default, a relationship is transferable, which means the end can be disconnected from the current instance and reconnected to another instance	Y
To		
Relationship Name	• relationship names must be meaningful • both sides of a relationship must be named • "catch all" phrases (related to, associated with) should be avoided in favour of more descriptive names Note: It is often helpful to consider the relationship name in the context of a sentence as follows: EACH entity1 MUST BE/MAY BE relationship ONE AND ONLY ONE/ONE OR MORE entity2 for example: EACH student MUST BE enrolled in ONE OR MORE classes, or EACH class MAY BE comprised of ONE OR MORE students	Y
Minimum Cardinality	• defines optionality of the relationship 0: MAY BE 1: MUST BE	Y
Maximum Cardinality	• mandatory in the sense that it must be considered • defines the degree of the relationship 1: ONE AND ONLY ONE null: ONE OR MORE	Y
Transferable	• mandatory in the sense that it must be considered	Y

Notes:

- One-to-one relationships should be carefully reviewed; they may actually be sub-types, perhaps with different names or attributes or relationships.

- Relationships that are optional at both ends should also be carefully reviewed; they are nearly always a modeling error.

5.4.7 Domains

A domain categorizes the nature of the data represented by a group of attributes, and indicates the general purpose of those attributes. The use of domains can save time and apply a desirably high degree of standardization across attribute definitions and, subsequently, column names.

Domains are also used to implement lists and ranges of valid values. The use of domains to implement lists of values should only be considered when the list of allowable values is static (e.g. days of week, months of the year, yes/no indicators).

Only include attributes in a domain when the values that they represent all have the same business meaning. Where applicable, domains must also represent the same units of measure.

Domains must be defined for each application and must be reviewed by the Data Administrator.

It is the Ministry standard to place all attributes under domains.

Property	Rule	Req?
Name	• should be made up of one to three real words • when the domain name is only one word, it must not be an Oracle Reserved Word • should be singular • should be meaningful; abbreviations should be avoided unless obvious	Y
Attributes in Domain	• These fields define the datatypes to be used for attributes	
Format		Y
Ave Att Length		Y
Max Att Length		Y
Att Decimal Places	• mandatory for numeric datatypes	N
Unit of Measure	• applicable to Domain Attributes only	N
Columns in Domain	• These fields define the datatypes to be used for columns	
Datatype		Y

Property	Rule	Req?
Ave Col Length		Y
Max Col Length		Y
Col Decimal Places	• mandatory for numeric datatypes	N
Dynamic List?	• if selected, will cause the LOV to be implemented as a table lookup (<APPL>_REF_CODES) Note: This is only if the column's Display Datatype is Poplist or Text	N
Documentation		
Comment	• should contain a simple description of the domain	Y
Description	• describes the domain	Y
Notes	• contains any additional information about the domain	N

If the domain is enumerated, then the values are listed under the Allowable Values sub-node.

Property	Rule	Req?
Value	• valid value for the attribute/column in this domain or the lowest allowable value when implementing a range of values	Y
High Value	• maximum allowable value when implementing a range of values	N
Abbreviation	• mandatory for entries representing a valid value in a list of values	N
Meaning	• mandatory for entries representing a valid value in a list of values	N
Display Sequence	• mandatory for entries representing a valid value in a list of values • determines the order the values are displayed in the list	N
Documentation		
Description	• contains a description of the allowable value/range	N
Notes	• contains any additional information about the allowable value/range	N

In Oracle Designer, changes to a domain can only be propagated to the associated attributes and columns by using the *Update Attributes in a Domain* and *Update Columns in a Domain* utilities. These can be accessed from the Utilities menu of the Repository Object Navigator.

Note: For enumerated values, a lookup entity (with the valid values stored as data) may be more appropriate if the valid values are subject to change; for example, city names or product codes. If the valid values are relatively static, then a domain is more appropriate; for example, gender or compass direction.

5.4.8 ERD Checklist

This ERD checklist can be used to confirm completeness of ERD deliverables (Logical Data Model section only in the Figure below.)

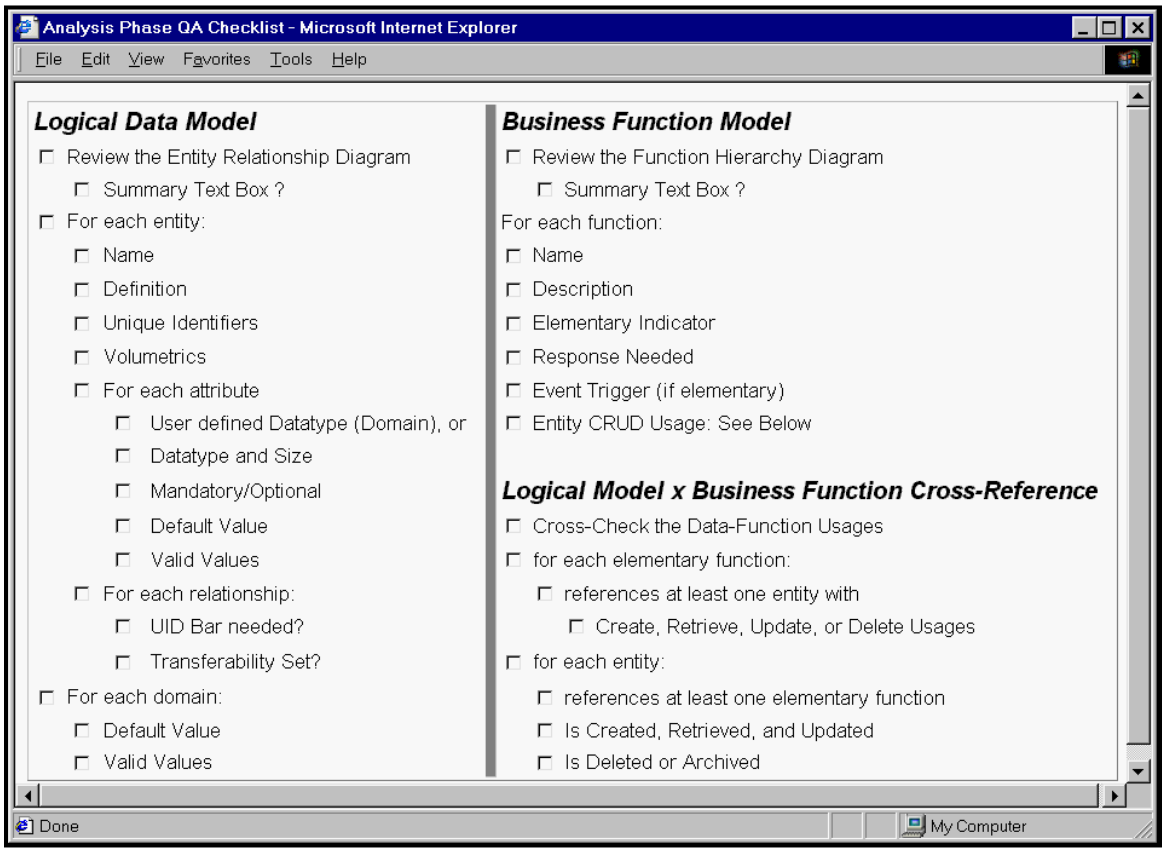


Figure 5 - ERD / Logical Data Model checklist

Note that Ministry Quality Assurance reviews will reference the Data Modeling standards found on the Government of British Columbia's IM/IT Standards – Data Administration Standard.

5.5 Oracle Designer Report Deliverables

5.5.1 System Glossary Report

- Entity names should be singular
- Entity names should be meaningful and the use of abbreviations should be kept to a minimum. A typical entity name is a noun
- A standard list of abbreviations can be found in Appendix C – Standard Approved Abbreviations, and should be used wherever possible
- All entities must have a clear business description. The description must explain what the data is to non-application personnel (e.g. Data Administration)
- Descriptions for abstract entities should contain concrete examples
- All references to other objects should be capitalized.

5.5.2 Entity Definition Report

- Entity names must be singular
- Entity names must be meaningful and the use of abbreviations should be kept to a minimum. A typical entity name is a noun
- A standard list of abbreviations can be found in Appendix C – Standard Approved Abbreviations, and should be used wherever possible
- All entities must have a clear business description. The description must explain what the data is to non-application and non-technical personnel

  Note: It is a Ministry standard that the business area expert(s) (i.e. client representative, business analyst, and data administrator) review and approve these descriptions

- Descriptions for abstract entities should contain concrete examples.
- All references to other objects should be capitalized.
- Where applicable, use should be made of Oracle's support of sub-type entities and domains.
- All super-type entities must have a unique identifier.
- All sub-type entities must have at least one relationship or attribute different from their super-type.
- All sub-type entities must be mutually exclusive
- *Many–to–many* relationships must be resolved with an intermediate entity.
- Relationship names must be meaningful and both sides of a relationship must be named. It is helpful to consider the relationship name in the context of a sentence as follows:

  ```
  EACH ENTITY1 MUST BE/MAY BE relationship ONE AND ONLY ONE/ONE OR
  MORE ENTITY2

  For example:
  ```

```
EACH STUDENT MUST be enrolled in ONE OR MORE CLASSES
EACH CLASS MAY BE comprised of ONE OR MORE STUDENTS
```

Note: The Entity Model Reference Report has a 'Relationships' section where you may check the relationship wording.

5.5.3 Entities & Their Attributes Report

Any attribute where the attribute name does not effectively describe the nature of the attribute must have an associated note. An example would be an attribute name that would exceed the 30-character limit, if fully descriptive.

Note: It is a Ministry standard that the business area expert(s) (i.e. client representative, business analyst, and data administrator) review and approve these attributes and associated elements.

5.5.4 Entity Completeness Checks

Any entity that appears on this report should have justifications documented in the Entity Notes. An example is an intersection entity, which has no attributes. The checks are:

- No Attributes
- No Description
- No Unique Identifiers
- With No Relationships
- Not Used by any Functions

5.5.5 Domain Definition Report

All attributes should be placed under a domain. This Report lists all the domains and their descriptions. There are currently no Ministry standard domains, so application-specific ones may be defined. Domains must be reviewed and approved by ministry Data Administrator

Note: The Ministry is currently reviewing its COMMON set of domains.

5.5.6 Attributes in a Domain Report

There are benefits to creating and using application-specific domains wherever an attribute is used in more than one entity. If this approach is taken, it is easier to ensure that datatype mismatches between entities/tables are avoided, and that any changes to

the datatype can be made at the domain level, and then flushed throughout the application.

It is therefore a Ministry standard that extensive use of application-specific domains be used for every attribute/column.

APPENDIX C – STANDARD APPROVED ABBREVIATIONS

Mandatory Abbreviations

Verb or Noun	Abbreviation
AVERAGE	AVG
DESCRIPTION	DESC
CODE	CD
HECTARES	HA
IDENTIFICATION	ID
INDICATOR	IND
MAXIMUM	MAX
MINIMUM	MIN
NUMBER	NO
PERCENT	PCT
SURROGATE KEY	SKEY
TIME	TM
TRANSACTION	TXN
XREF	XF
YEAR-TO-DATE	YTD

Preferred Abbreviations

Verb or Noun	Abbreviation	Verb or Noun	Abbreviation
ADDRESS	ADDR	ADMINISTRATION	ADMIN
ALTERNATE	ALT	AMOUNT	AMT
AMERICAN	USA	A PPLICATION	APPL
AUTHORITY	AUTH	BUSINESS	BUS
CANADIAN	CDN	CATEGORY	CAT
CLASSIFICATION	CLASS	CLIENT	CLI
COLLECTION	CLCTN	COLUMN	COL
COMMENT	CMT	COMMISSION	COMM
COMMITTEE	CTTE	COMPANY	CO
CONDITION	CONDTN	CONTROL	CTL
CONVERSION	CNV	COORDINATE	COORD
CORPORATION	CORP	CORRECTION	CRCTN
COUNT	CNT	CREDIT	CR
DATE (Gregorian Date)	DT	DAY	DY

Verb or Noun	Abbreviation	Verb or Noun	Abbreviation
DESTINATION	DEST	DEPARTMENT	DEPT
DETAIL	DTL	DEVELOPMENT	DEV
DIAMETER	DIAM	DISTRICT	DIST
DIVISION	DIV	DOCUMENT	DOC
EFFECTIVE	EFF	ELEMENT	ELMNT
ERROR	ERR	ESTIMATE	EST
EXECUTIVE	EXEC	EXPIRY	EXP
FACTOR	FCTR	FEDERAL	FED
GROUP	GRP	HEIGHT	HGHT
HOUR	HR	INDEX	INDX
INITIAL	INIT	INVENTORY	INV
JURISDICTION	JURIS	LATITUDE	LAT
LENGTH	LEN	LETTER	LTR
LICENCE	LIC	LOAD	LD
LOCATION	LOCN	LONGITUDE	LONG
MANAGEMENT	MGT	METHOD	MTHD
MINUTE	MN	MONTH	MO
NAME	NM	ORGANIZATION	ORG
PAYMENT	PAY	PERMIT	PRMT
PIECE	PCE	POSITION	POS
PREVIOUS	PREV	PRIMARY	PRI
PRODUCT	PROD	PROJECT	PROJ
QUANTITY	QTY	RECEIVED	RECV
REFERRED	REF	REGION	REG
REGISTRATION	REGN	RESPONSE CENTRE	RCC
REQUEST	RQST	REQUIRED	REQ
REQUIREMENT	RQMT	RETURN	RET
REVENUE	REV	SCHEDULE	SCHED
SCREEN	SCR	SEARCH	SRCH
SECONDARY	SEC	SECTION	SECT
SEQUENCE	SEQ	SERVICE	SRVC
SOURCE	SRCE	SPECIES	SPP
STATEMENT	STMT	STATUS	STS
STATUTORY	STAT	STATISTICS	STATS
TENURE	TENR	TEXT	TXT
TIMESTAMP	TS	TITLE	TTL
TOTAL	TOT	TREATMENT	TRTMT
TYPE	TYP	USERID	UID
VALUE	VAL	VERSION	VER
VISITATION	VISIT	VOLUME	VOL

Verb or Noun	Abbreviation	Verb or Noun	Abbreviation
WITHDRAWAL	WD	WEIGHT	WGT
YEAR	YR		