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Central Data Administration

Data Model Tool Use Procedure

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Version 4.0	03/08/2010	Added new UDP to capture ANSI/ISO UDP standard element names	8 & 18
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Introduction

The data modeling tool provides the necessary documentation and graphical representation of the data requirements to facilitate communication within and among components.

Project data analyst must use the ERwin Data Modeling tool to capture the data design.

- ERwin Data Modeler is used on individual workstations.
- Agency standard ERwin User Defined Properties (UDP), data model templates (ERwin files) are required starting points for new Logical\Physical, Logical Only, and Physical Only models. These templates include the standard UDPs that are required components of all new models.
- Data Administration provides modeling tool software licenses and registration information.

Contact Data Administration (DataAdmin@cms.hhs.gov) for assistance with activities, standard data models and modeling software tools.

The purpose of this document is to:

1. Provide the set of procedures for creating a new data model; Conceptual or Project Logical Only or Project Logical/Physical or Project Physical Only, using the CMS Standard Data Modeling Tool Erwin. Refer to Appendix A for a definition of the ERwin Model Types.
2. Provide the procedure for incorporating User Defined Properties (UDP's) into an existing Erwin Data Model.

References throughout this document to the Logical Data Design Document and DM OP-xxx are to be found in the Data Management Operating Procedures and Guidelines Document at <http://www.cms.hhs.gov/DataAdmin/>

Procedure: Creating New Logical Only or Logical/Physical Data Models

The following references will guide the creation of Logical Only or Logical/Physical Data Models.

1. For a project logical only or logical/physical model refer to 1.3.1 Set up the Project Logical Data Model in the Logical Design Document.
2. For a conceptual data model refer to 1.2.2 Create the Conceptual Data Model in the Logical Design Document
3. For a conceptual data model refer to DM OP-003 Operating Procedure for Developing the Conceptual Data Model.
4. For a project logical only or logical/physical model refer to DM OP-005 Operating Procedure for Developing the Logical Data.

When a modeler is tasked with creating a brand-new project data model; Logical Only or Logical/Physical, data model templates (ERwin files) should be used as a starting point to facilitate the introduction of the standard UDPs. The modeler will simply:

1. Open up one of the following models available on the CMS web site.
<http://www.cms.hhs.gov/DataAdmin/> under Downloads-UDP Templates
 - a. STD_LDM_UDP Template ErwinV'nn'.erwin
 - b. STD_LDM_PDM_UDP Template ErwinV'nn'.erwin
2. Click "save as" to save the template under the name desired for the new data model. Refer to DM OP-028 Operating Procedure for Naming and Defining Data Models

The modeler can now open the model just created from the template. This model will initially contain no entities, tables, etc. But as a consequence of having used the template as a starting point, every new object that is subsequently added (manually or by using "Complete Compare" the later is a function that can be accessed through the Tool menu) to the new model will immediately have the correct standard UDPs, ready for whatever entry is relevant. The modeler is thus spared the effort of having to add the UDPs to a new data model.

If the model type is an LDM/PDM attach the .nsm file to the new model. Always attach the latest published .nsm file; Reference CMS Standard Terms available for download from the CMS web site. <http://www.cms.hhs.gov/DataAdmin/> The following procedures should be followed to attach this file to the model.

1. Click "TOOLS" on the ERwin Tool Bar
2. Select "NAME" and click "Model Naming Options"
3. Select General Tab
4. Click "Use File" then enter the path to the .nsm file on your computer, alternatively you can select "Browse" to assist in finding the file, and then Click "Set"
5. Select "Name Mapping" tab

6. Check boxes “Use Gloss” for entity to table, domains, and attribute to column
7. Click “OK”

1.1. Procedure: Capturing Model Level Metadata

The following references will guide the creation of the Model Level Metadata within the ERwin Data Modeling tool.

1. For a project logical data model refer to 1.3.1 Set up the Project Logical Data Model in the Logical Design Document
2. For a conceptual data model refer to 1.2.2 Create the Conceptual Data Model in the Logical Design Document
3. For all data models refer to DM OP-031 Operating Procedure for Capturing the Standard Logical Data Model Metadata.
4. For all data models refer to ERwin Documentation

Additionally the following should be annotated for all data models:
On the UDP Tab enter the content for required Model UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Model-Level metadata and the corresponding ERwin Modeling Tool location where this Model-Level metadata must be captured.

CMS Standard Model-Level Metadata	ERwin Model Metadata (access path)
Model Name	Model:Model Properties:General: Name
Model Author	Model:Model Properties:General: Author
Model Type	Refer to Section 1 above
Model Definition	Model:Model Properties: Definition
Model Version Effective Date	Model:Model Properties:UDP: Model Version Effective Date
Model Central DA Name	Model:Model Properties:UDP: Model Central DA Name
Model Business Owner Name	Model:Model Properties:UDP: Model Business Owner Name
LDM CDA Signoff Date	Model:Model Properties:UDP: LDM CDA Signoff Date
Project Name	Model:Model Properties:UDP: Project Name
Project Release Date	Model: Model Properties:UDP: Project Release Date

1.2. Procedure: Creating New Entities and Metadata

The following references will guide the creation of the Entity Level Metadata in the ERwin Data Modeling tool.

1. For all logical models (Project/Conceptual) refer to 1.4.1 Create New Entities in the Logical Design Document
2. For all logical data models refer to DM OP-031 Operating Procedure for Capturing the Standard Logical Data Model Metadata.
3. For all data models refer to ERwin Documentation
4. For all data models refer to DM OP-008 Operating Procedure for Defining Data Entities.
5. For all data models refer to DM OP-009 Operating Procedure for Naming Data Entities.
6. For Conceptual Data Models refer to DM OP-003 Operating Procedure for Developing the Conceptual Data Model.
7. For all data models refer to DM OP-042 Operating Procedure for Modeling Supertypes and Subtypes.

Additionally the following should be annotated for all data models:
On the UDP Tab enter content for required Entity UDPs. Refer to Data Management Operating Procedures and Guidelines document DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Entity-Level metadata and the corresponding ERwin Modeling Tool location where this Entity Level metadata must be captured.

CMS Standard Entity-Level Metadata	ERwin Entity Metadata (access path)
Entity Name	Model:Entities: Name
Entity Definition	Model:Entities: Definition
Entity Requirement ID	Model:Entities:UDP: Requirement ID (multiple Requirement IDs are separated by semicolons)
Entity Security Category Description	Model:Entities:UDP: Entity Security Category Description
Logical Only Entity Indicator	Model:Entities: Logical Only
Entity ELDM Name	Model:Entities:UDP: Entity ELDM Name

1.3. Procedure: Creating New Attributes and Metadata

The following references will guide the creation of the Attribute Level Metadata in the ERwin Data Modeling tool.

1. Refer to sections 1.4.2 Create New Attributes, 1.4.3 Model Derived Data, 1.4.6 Determine Primary Identifiers, and 1.4.8 Define Domain Value Rules in the Logical Design Document
2. Refer to DM OP-031 Operating Procedure for Capturing the Standard Logical Data Model Metadata.
3. Refer to DM OP-010 Operating Procedure for Defining Data Attributes.
4. Refer to DM OP-011 Operating Procedure for Analyzing Types of Data Attributes.
5. Refer to DM OP-012 Operating Procedure for Naming Data Attributes.
6. For all data models refer to ERwin Documentation

Additionally the following should be annotated for all data models:
On the UDP Tab enter the required Attribute UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Attribute-Level metadata and the corresponding ERwin Modeling Tool location where this Attribute Level metadata must be captured.

CMS Standard Attribute-Level Metadata	ERwin Attribute Metadata (access path)
Attribute Name	Model:Attributes:New: Attribute Name
Attribute Definition	Model:Attributes: Definition
Attribute Domain Name	Model:Attributes:General: Domain
Attribute Logical Only Indicator	Model:Attributes:General: Logical Only
Attribute Valid Values	Model:Attributes:Data Type: Valid Model:Attributes:Constraint: Valid (ERwin V 7) Or Model:Attributes:UDP: Attribute Valid Values
Attribute Required Indicator	Model:Attributes:Data Type: Required Model:Attributes:Data Type: Not Null (ERwin V7)
Attribute Primary Key Indicator	Model:Attributes:General: Primary Key
Attribute Derivation Text	Model:Attributes:UDP: Attribute Derivation Text
Attribute Requirement ID	Model:Attributes:UDP: Attribute Requirement ID (multiple Requirement IDs are separated by semicolons)
Attribute Data Source Name	Model:Attributes:UDP: Attribute Data Source Name (multiple Source Names are separated by semicolons)
Attribute Alias Name	Model:Attributes:UDP: Attribute Alias Name (multiple Alias Names are separated by semicolons)
Attribute ELDM Name	Model:Attributes:UDP: Attribute ELDM Name
ANSI/ISO Standard Element Name	Model:Attributes:UDP: ANSI/ISO Standard Element Name (multiple pairs of Standard Element Names are separated by semicolons.)

1.4. Procedure: Creating New Relationships and Metadata

The following references will guide the creation of the Relationship Metadata in the ERwin Data Modeling tool.

1. Refer to 1.4.5 Define Relationships in the Logical Design Document
2. Refer to 1.2.2 Create the Conceptual Data Model in the Logical Design Document
3. Refer to 1.4.4 Identify and Model Supertypes and Subtypes in the Logical Design Document
4. Refer to DM OP-015 Defining Relationships, Cardinality and Optionality.

Additionally the following should be annotated for all data models:
On the UDP Tab enter the required Attribute UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Relationship-Level metadata and the corresponding ERwin Modeling Tool location where this Relationship-Level metadata must be captured.

CMS Standard Relationship-Level Metadata	ERwin Attribute Metadata (access path)
Relationship Parent-to-Child Verb	Model:Relationship:General:Verb Phrase: Parent-to-Child
Relationship Cardinality	Model:Relationship:General: Relationship Cardinality: Cardinality
Relationship Optionality	Model:Relationship:General: Relationship Cardinality: Relationship Type
Relationship Definition	Model:Relationship: Definition

2. Procedure: Creating PDM for LDM/PDM Data Model

Erwin will automatically generate the PDM version of the LDM. To change the model view, click Physical Model on the Model menu. The .nsm file referenced in Section 1.0 will generate a first cut physical name from the entity and attribute logical name on the LDM side of the data model for all tables and columns. The results may not be consistent with the selected DBMS. Therefore it will be necessary to review the names that have been generated automatically to ensure compliance with the standards for naming tables and columns.

If physical-only tables and/or columns are added to the physical view of an LDM/PDM data model, then the following procedures apply.

2.1. Procedure: Creating New Tables and Metadata

Refer to 3.2 Creating New Tables and Metadata of Section 3 Creating New Physical Data Models Using ERwin.

2.2. Procedure: Creating New Columns and Metadata

Refer to 3.3 Creating New Columns and Metadata of Section 3 Creating New Physical Data Models Using ERwin.

2.3. Procedure: Creating New Relationships and Metadata

Refer to 3.4 Creating New Relationships and Metadata of Section 3 Creating New Physical Data Models Using ERwin.

3. Procedure: Creating New Physical Data Models Using ERwin

When a modeler is tasked with creating a new project physical only data model, the physical data model template should be used as a starting point to facilitate the introduction of the standard UDPs. The modeler will:

1. Open up the following model available on the CMS web site.
<http://www.cms.hhs.gov/DataAdmin/> under Downloads-UDP Templates
 - a. STD_PDM_UDP Template ErwinV'nn'.erwin
2. Do a "save as" in order to save the template under the name desired for the new data model. Refer to DM OP-028 Operating Procedure for Naming and Defining Data Models.

The modeler can now open the model just created from the template. This model will initially contain no tables, etc. But as a consequence of having used the template as a starting point, every new object that is subsequently added (manually or by using "Complete Compare") to the new model will immediately have the correct standard UDPs, ready for whatever entry is relevant. The modeler is thus spared the effort of having to add the UDPs to a new data model.

3.1. Capturing Model Level Metadata

The following references will guide the creation of the Model-Level Metadata in the ERwin Data Modeling tool.

1. For all data models refer to DM OP-032 Operating Procedure for Capturing the Standard PDM Metadata.
2. For all data models Refer to ERwin Documentation

Additionally the following should be annotated for all data models: On the UDP Tab enter the content for required Model UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Model-Level metadata and the corresponding ERwin Modeling Tool location where this Model Level metadata must be captured.

CMS Standard Model-Level Metadata	ERwin Model Metadata (access path)
Model Name	Model:Model Properties:General: Name
Model Author	Model:Model Properties:General: Author
Model Type	Refer to Section 1 above
Model Definition	Model:Model Properties: Definition
Model Version Effective Date	Model:Model Properties:UDP: Model Version Effective Date
Model Central DA Name	Model:Model Properties:UDP: Model Central DA Name
Model Business Owner Name	Model:Model Properties:UDP: Model Business Owner Name
Model Central DBA Name	Model:Model Properties:UDP: Model Central DBA Name
Model Local DBA Name	Model:Model Properties:UDP: Model Local DBA Name
Project Name	Model:Model Properties:UDP: Project Name
Project Release Number	Model:Model Properties:UDP: Project Release Number

3.2. Procedure: Creating New Tables and Metadata

The following references will guide the creation of the Table Level Metadata in the ERwin Data Modeling tool.

1. Refer to DM OP-032 Operating Procedure for Capturing the Standard PDM Metadata.
2. Refer to ERwin Documentation
3. Refer to DM OP-045 Operating Procedure for Constructing Physical Table or File Names.

Additionally the following should be annotated for all data models: On UDP Tab enter the content for required Model UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Table-Level metadata and the corresponding ERwin Modeling Tool location where this Table-Level metadata must be captured.

CMS Standard Table-Level Metadata	ERwin Table Metadata (access path)
Table Name	Model:Tables: Name
Table Comment	Model:Tables: Comment
Physical Only Table Indicator	Model:Tables: Physical Only
Logical Entity Equivalent Name	Model:Tables: UDP: Logical Entity Equivalent Name
Table Requirement ID	Model:Tables:UDP: Table Requirement ID (multiple Requirement IDs are separated by semicolons)
Table Security Category Description	Model:Tables:UDP: Table Security Category Description
Logical Entity Name	Model:Tables:UDP: Logical Entity Name (multiple Entity Names are separated by semicolons)

3.3. Procedure: Creating New Columns and Metadata

The following references will guide the creation of the Column-Level Metadata in the ERwin Data Modeling tool.

1. For all data models refer to DM OP-032 Operating Procedure for Capturing the Standard PDM Metadata.
2. For all data models Refer to ERwin Documentation
3. Refer to DM OP-046 Operating Procedure for Constructing Physical Column or Element names.
4. Refer to DM OP-041 Operating Procedure for Assigning Date Formats.

Additionally the following should be annotated for all data models: On UDP Tab enter the content for required Model UDPs. Refer to DM OP-031 Standard Metadata Matrix.

The following table identifies the CMS Standard Column-Level and the corresponding ERwin Modeling Tool location where this Column- Level metadata must be captured.

CMS Standard Column-Level Metadata	ERwin Column Metadata (access path)
Column Name	Model:Columns:New: Column Name
Column Comment	Model:Columns: Comment
Column Domain Name	Model:Columns:General: Domain
Column Null Option	Model:Columns(Database): Null Option
Physical Only Column Indicator	Model:Columns:General: Physical Only
Primary Key Indicator	Model:Columns:General: Primary Key
Column Data Source Name	Model:Columns:UDP: Column Data Source Name (multiple Sopurce Names are separated by semicolons)
Column Requirement ID	Model:Columns:UDP: Column Requirement ID (multiple Requirement IDs are separated by semicolons)
Column Derivation Text	Model:Columns:UDP: Column Derivation Text
Logical Attribute Name	Model:Columns:UDP: Logical Attribute Name (multiple Attribute Names are separated by semicolons)

3.4.Procedure: Creating New Relationships and Metadata

The following references will guide the creation of the Relationship Level Metadata in the ERwin Data Modeling tool.

For all data models Refer to ERwin Documentation

4. Procedure: Incorporating User Defined Properties (UDP's) into existing Data Models

The following references will guide the creation of the UDP's into an existing data model.

For all data models Refer to ERwin Documentation

In addition to the procedures referenced in the ERwin documentation it is recommended that you first **make a copy** of the ERwin data model that you wish to import UDPs into. Then immediately **rename** this copy to clearly indicate that it is the target data model that will be used in the import attempt. This will preserve the original data model in case something unwanted happens to the target data model during the Complete Compare work.

For the "Compare Current Model with" use model UDP template, named

"Std_PDM_UDP_Template ErwinV'nn' for Physical Only Models

"Std_LDM_UDP_Template ErwinV'nn' for Logical Only Models

"Std_LDM_PDM_UDP_Template ErwinV'nn' for Logical/Physical Models.

Appendix A ERWIN Model Type Definitions

ERwin Data Model Type	Definition of the Type of ERwin Data Model
Logical Only	<p>A type of ERwin data model that exists for the express purpose of representing business information and defining business rules.</p> <p>This could be the Project Logical Data Model or a Conceptual Data Model.</p>
Physical Only	<p>A type of ERwin data model that exists for the express purpose of focusing on the physical implementation of the logical data model in a database.</p>
Logical\Physical (Logical View)	<p>A type of ERwin data model that automatically includes both a logical and a physical model. This is made possible by the user's ability to toggle between a "Logical View" and a "Physical View" of the same data model. The "Logical View" exists primarily for the purpose of representing business information and defining business rules. The "Logical View" however also typically serves as the starting point for the "Physical View".</p>
Logical\Physical (Physical View)	<p>A type of ERwin data model that automatically includes both a logical and a physical model. This is made possible by the user's ability to toggle between a "Logical View" and a "Physical View" of the same data model. The "Physical View" exists primarily for the purpose of depicting the physical implementation of the "Logical View" of the data model in a database.</p>