	DEPARTMENT OF HEALTH AND HUMAN SERVICES **ENTERPRISE PERFORMANCE LIFE CYCLE FRAMEWORK** **PRACTICES GUIDE** **LOGICAL DATA MODELING**	*<OIDV Logo>*

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Document Purpose

This Practices Guide is provides an overview describing the best practices, activities, attributes, and related templates, tools, information, and key terminology of industry-leading project management practices and their accompanying project management templates.

Background

The Department of Health and Human Services (HHS) Enterprise Performance Life Cycle (EPLC) is a framework to enhance Information Technology (IT) governance through rigorous application of sound investment and project management principles, and industry best practices. The EPLC provides the context for the governance process and describes interdependencies between its project management, investment management, and capital planning components. The EPLC framework establishes an environment in which HHS IT investments and projects consistently achieve successful outcomes that align with Department and Operating Division goals and objectives.

A Logical Data Model (LDM) is a complete representation of data requirements and the structural business rules that govern data quality in support of project's requirements. The LDM shows the specific entities, attributes and relationships involved in a business function and is the basis for the creation of the physical data model.

Practice Overview

A logical data model is a graphical representation of the business requirements. They describe the data that are important to the organization and how they relate to one another, as well as business definitions and examples. The logical data model is created during the Requirements Analysis Phase and is a component of the Requirements Document.

The logical data model helps to build a common understanding of business data elements and requirements and is the basis of physical database design. It helps to avoid data redundancy and helps to prevent inconsistencies in the data.   Logical Data Modeling helps to clarify and confirms business requirements. The focus is on the requirements and is independent of technology. Logical data modeling includes entities/tables, attributes/columns/fields and relationships and helps to resolve many-to-many relationships between entities into one-to-many relationships. Business names should be used when defining the data entities/tables and attributes/columns/fields.

Best Practices

- **Communicate** – The most important step in defining the logical data model is talking to people, specifically the business stakeholders.
- **Conduct with Requirement Gathering and Analysis** – The best time to consider the logical data model is during the Requirements Analysis Phase.
- **Iterative Process** – Similar to requirements management, logical data modeling is an ongoing, iterative process.
- **Review and Approve** – The logical data model should be reviewed and approved by business owners and other appropriate project stakeholders.
- **Document** – Document the logical data model. Be sure to use naming conventions that reflect the business process.
- **Review** – Conduct regular reviews of the logical data model.
- **Change Management** – Establish a change management strategy for data model changes.

Practice Activities

The following are recommended activities for logical data modeling:

- **Collaborate –** Be sure that the appropriate stakeholders, including the customer, should participate in logical data modeling activities.
- **Select a specific method** - Select a specific method for this effort taking into consideration OPDIV's standards and specific project needs.
- **Identify the entities** – Identify the entities that are applicable to the business requirements.
- **Alignment with OPDIVs conceptual data model** - Ensure that individual project logical models align with the OPDiv's conceptual data model.
- **Document the entities** - Include a glossary that defines each entity. Use business names that make sense to you're the business stakeholders.
- **Define attributes for all entities** – Identify the attributes. Each entity will contain one or more attribute. Getting the attributes correct during logical data modeling is critical to reducing the need to re-work of your database. For example, prior to Y2K, the year attribute was stored as YY.
- **Identify the relationships between entities -** Resolve many-to-many relationships between entities into one-to-many relationships.
- **Define primary keys for all entities** - A key consists of one or more attributes that are unique. A composite key is a key containing two or more attributes. One of these keys must be identified as the primary key while the others become alternate keys.
- **Normalize the entities** – Normalize the entities to reduce data redundancy. The reason for having a highly normalized data model is that information is stored in one place reducing the possibility of inconsistent data.
- **Validate the model** - Run business transactions against the logical data model. For example, if Customers can change their Address then the model must show a connection between 'Customer' and 'Address'.