
Part II — Information Architecture

Chapter 3 — Conceptual Data Model

Introduction

The Medicaid IT Architecture (MITA) Framework Information Architecture (IA) will recommend data standards, identify enabling technologies, and specify interoperable designs for data exchange. Data models represent a significant portion of the IA.

The MITA Framework 2.0 does not contain a Conceptual Data Model (CDM). Future versions of the MITA Framework will develop a CDM. Framework 2.0 is a placeholder for the MITA CDM and describes information about the CDM.

A data model is a preliminary representation of something that serves as the plan from which the final object is to be constructed. MITA's data models document the data (and the characteristics of that data) required to satisfy the needs of the Medicaid enterprise. Data models serve as a blueprint or plan for building information systems, and they serve as a tool that enables the reengineering of business processes and enterprise strategies. Specifically, the MITA data models will be used by Medicaid system architects and designers to develop plug-and-play and interoperable Medicaid information services.

This chapter answers the following questions:

- What are the parts of the MITA Conceptual Data Model?
- How will the MITA Conceptual Data Model be developed?
- How do States use the MITA Conceptual Data Model?

Purpose

The Conceptual Data Model (CDM) provides a mechanism to bridge the gap between Medicaid subject matter experts and IT architects and designers. The model depicts the major business information objects (subjects/entities) in their relationships to each other using business terminology. In addition, the MITA CDM provides the basis for an IT staff (e.g., MITA, States, or vendors) to develop a Logical Data Model (LDM) (discussed in Part II Chapter 4). The CDM also provides an initial mechanism for ensuring the completeness of the business model and serves as a tool that enables the reengineering of Medicaid business processes. It is only through the use of a shared data model that the States will achieve true plug-and-play capabilities of services and interoperability.

Scope

The following list provides an overview of the scope of the MITA CDM:

- MITA Framework 2.0 does not contain a MITA CDM. Future versions of the MITA Framework will evolve as the processes and services are defined in detail and will, at a minimum, contain all the data needed by the defined process and services.
- The MITA CDM will include all of the data that is common to States, regardless of location or systems currently performing the process, and the relationships of these common subject areas.
- The MITA CDM will be extended to be compatible with the electronic health records once they are defined.
- The MITA CDM will not contain information regarding a State's unique processes and data. It is the State's responsibility to supplement the MITA CDM with its unique data requirements in the State's own CDM.

What Is the MITA Conceptual Data Model?

The CDM identifies subject areas and groupings of data important to the business and defines their general relationships. Examples of these groupings for MITA are Member, Provider, Address, and Claim. These groupings in data modeling terminology are referred to as *entities*. The CDM also depicts the relationship between entities. For example, a Member has an Address (see **Figure 3-1**). The model also shows whether this relationship is mandatory or optional and whether it is a one-to-one, one-to-many, or many-to-many. The CDM will also reference any associated data standards.

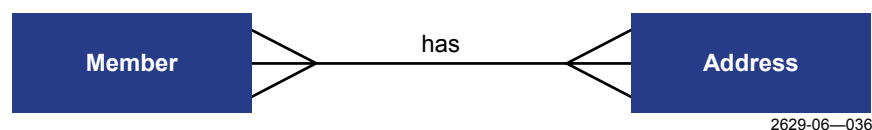


Figure 3-1. Simple Conceptual Data Model

What Are the Parts of the MITA Conceptual Data Model?

In the MITA Framework, the CDM must have the following associated data:

- **Entities.** An entity represents a person, place, thing, organization, event, or concept of interest to the State and the Centers for Medicare & Medicaid Services (CMS). It is an object (or concept) about which States store information. In general, an entity must have the following characteristics:
 - An entity must have one or more attributes that distinguish between individual occurrences of that entity.
 - An entity must have at least one relationship to another entity.

- **Relationships.** Relationships depict the business rules/requirements by which two entities are joined. The interaction between the entities joined by the relationship can be traced in either direction.
- **Definitions.** Definitions must be clear, precise, and unambiguous. They must identify and distinguish the item being defined from any other actual or possible item. Examples or exclusions may be used as needed to improve clarity.
- **Domains.** The domain to be applied to the entity must be specified.
- **Related standards.** Any standards related to the entity must be defined.
- **Entity-Relationship (E/R) Diagram.** E/R diagramming is the method by which a formal, graphical depiction of the model is produced.

How Will the MITA Conceptual Data Model Be Developed?

It is the long-term plan for the following process to be used to develop the MITA CDM:

- Develop a CDM based on HL7's Reference Information Model (RIM), the standard information model for healthcare, in order to achieve interoperability and follow industry standards. The MITA CDM will be extended as required to meet Medicaid-specific information requirements by incorporating a subset of early-adopter State Medicaid enterprises' data models.
- Distribute the draft CDM to early adopters, States and vendors, for review.
- Update the model with comments. At this point, the CDM only represents the current state of data.
- Update the model to include all Medicaid enterprise data (current and future) to develop a 360-degree view of the information domain.
- Submit the model for second review to early adopters and then to all States.
- Submit the updated model to MITA for adoption as the standard MITA CDM.

In parallel with this process, the MITA CDM will be developed as part of an HL7 information model prototype ("sandbox") and, when approved, will be submitted by MITA as an HL7 standard.

It is the long-term goal that a MITA repository will be developed. Once the MITA repository has been deployed, the complete MITA CDM will be located on it.

How Do States Use the MITA Conceptual Data Model?

When developed, the MITA CDM will be used as a reference document that provides a high-level overview of the data and relationships used by a MITA-compliant Medicaid enterprise. The CDM provides a tool for ensuring the completeness of the business model.

States will need to extend the MITA CDM with their unique data requirements. States will also use the MITA CDM to help align their data models with MITA.

Conclusion

The MITA CDM will help to ensure that implementations are interoperable and plug-and-play capable. With participation by States, partners, and other stakeholders, the MITA CDM will provide the early guidance required to successfully develop the MITA LDM.