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NIH Grants Conceptual Data Model v1.0

Status of This Memo

This document specifies a standard for the National Institutes of Health (NIH) and requests discussion and suggestions for improvements. Distribution of this memo is unlimited.

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1 Introduction

The Grants Conceptual Data Model (CDM) provides a description of the key data entities and relationships that support NIH's grants business processes. The Federal Enterprise Architecture (FEA) Data Reference Model (DRM)[1] defines a conceptual data model as follows:

> *A data model represents an abstract view of the real world; (ISO 11179-3) a higher level data artifact that is often used to explore domain concepts with project stakeholders. Logical data models are often derived from conceptual data models. At this level, the data modeler attempts to identify the highest-level relationships among the different entities.*

This model is intended to provide a basis for the way NIH Information Technology (IT) solutions will structure data about grants and the management processes related to grants. This model captures the key business rules about the relationships between different types of data. The business rules can then be used by system designers and developers to ensure that data is represented consistently across NIH systems, data can be effectively shared, and systems meet business needs for information. The Grants CDM provides an overarching framework to organize more detailed grants data architecture efforts and a common taxonomy for describing grants data assets across the NIH.

1.1 Purpose of the Grants CDM

The purpose of the Grants CDM is to provide a conceptual view of the key data entities and relationships that support NIH's extramural research activities including the process of reviewing, awarding and managing grants.

The Grants CDM expands on the Enterprise CDM[2] and is focused more narrowly on the information related to grants and the management of extramural research. NIH needs a CDM specific to Grants for a number of reasons:

- To provide a foundation for supporting new ways of characterizing grants and related reporting requirements in the future.
- To provide a common vocabulary for the discussion of key enterprise data elements used for extramural research administration to allow for more consistent representation of requirements and description of systems.
- To provide a consistent basis for the development of the next generation of grants systems within NIH.
- To effectively and consistently manage information about grants in the future, and to provide an organizing framework for further Grants Information Architecture activities.

This high level representation allows NIH management and stakeholders to effectively understand the plan for a future-state data architecture that will enhance NIH's ability to share

[1] The DRM version 2.0 can be found at http://www.whitehouse.gov/OMB/egov/documents/DRM_2_0_Final.pdf
[2] NIH Enterprise CDM—NRFC0025, version 1.0, January 2007 - http://enterprisearchitecture.nih.gov/NR/rdonlyres/5D3017EA-22C1-4BCC-8E0F-79EB7B5C797A/0/NRFC0025.pdf

information across the enterprise and build more integrated, flexible systems. This version of the Grants CDM represents an initial iteration and will be progressively refined through future updates as business processes and systems evolve and as understanding of grants data needs is further refined.

The Grants CDM is intended to provide the basis to build systems that are more flexible to adapt to the changing business needs. The future vision of how NIH operates and how it provides funding opportunities and grants has become more complex, making the current systems unable to provide the requisite information in a consistent and reliable manner. The Grants CDM tries to address those challenges and takes into account the possibilities of resolving those challenges.

The Grants CDM can also help support the effective communication and outreach programs among the various stakeholders within an organization by having a common terminology. The Grants CDM is a key artifact that can be used as tool to help map the details on where the data resides and how it is being used within the organization.

For the staff who implements systems in the grants business area, the Grants CDM will help to incorporate the key structural elements of the CDM into new databases or provide extensions to the existing databases, provide a mechanism to map the implementation activities to the higher-level CDM and to leverage the CDM terms for naming conventions. As these systems are being developed, the lessons learned from their implementation will be incorporated back into the CDM model to further refine the business rules and context.

1.2 Intended Audience

This standard is available to the entire NIH community, but it is most relevant to the following NIH stakeholders:

- *Business Owners of Data*—The data entities described in this standard should be consistent with commonly used NIH business language, and the definitions of the entities should be understandable to business users.
- *Data Architects*—Those responsible for providing grants-specific data architecture leadership at the NIH enterprise level and the Institutes and Centers (ICs) levels should use the Grants CDM as a reference and will map their work products to the data entities identified within the Grants CDM.
- *IT Leaders and Planners*—CIOs within NIH Institutes and Centers and other senior IT leadership should use the Grants CDM as the common taxonomy for identifying NIH grants data assets in strategy and IT planning documents.
- *Solution Architects*—Architects responsible for the overall design of a new solution or enhancement of existing systems related to grants will be a key audience of the Grants CDM. Systems developed at NIH will often instantiate the high level conceptual entities and relationships identified in the Grants CDM in their logical and physical database designs. Solution architects for grant applications need to align their data entities to the key entities in the Grants CDM.
- *Database Designers*—The Grants CDM will help feed current state and future state documentation that will provide database designers with an understanding of the sources of record for key grants data elements within NIH and will provide a high level overview

of how the data related to grants is to be managed in their database relative to the overall structure of information across NIH.

- *IT Program Managers*—The managers of solution implementation efforts should be aware of the Grants CDM and other Enterprise Data Architecture artifacts and the alignment of their solutions with these artifacts. The NIH Capital Planning and Investment Control (CPIC)[3] process will require mapping for grants-specific IT solution development efforts to the Grants CDM.

1.3 Scope of Standard

The approved initial iteration of the Grants CDM is considered to be an NIH standard for all projects subject to alignment with the NIH Enterprise Architecture (EA) as part of the grants business segment. This document is intended to provide a conceptual view of key data entities required to support NIH's grants processes. In practical terms, this means that data architecture artifacts such as data dictionary, metamodels, etc developed related to grants processes should:

- Provide a mapping of the artifact to the Grants CDM
- Align the naming of data elements with those used in the Grants CDM

The Grants CDM is to be used by all of NIH in the development of their systems that support the Grants business area. This ensures the implementation models of the future grant systems applications support the shared core business processes. The model can also improve quality of design and save time in the development of data models and database designs in support of specific solutions.

For the purposes of this standard, data architecture is defined as efforts to identify cross-system and/or cross-organization strategies for data management that may include a current state, target state and transition strategy. This may also include documents addressing the governance of NIH grants data assets. It is assumed that grants data architecture efforts within NIH will coordinate with the Office of the Chief IT Architect (OCITA). Grants data architecture deliverables may be developed by data architecture within the ICs due to unique business rules and in support of major solution implementation efforts.

Further, solution development efforts subject to alignment with the NIH EA should:

- Develop data models in support of specific solutions that reflect the business rules implicit in the Grants CDM, even though the specific data structures may differ, in order to support system performance and address other implementation constraints.
- Develop data models and map them to the entities defined as part of the Grants CDM.
- Provide a mapping of the data exchanged with other systems to the Grants CDM.

The scope of this standard is limited to only a high level, conceptual view of the data entities and their key relationships in support of the management of grants.

This model does not address research contracts at this time. Research contracts will be addressed in a subsequent conceptual model to be developed in cooperation with business modeling efforts for research contracts.

[3] The NIH CPIC process guidelines can be found at http://irm.cit.nih.gov/itmra/CPIC.html.

Additional detailed descriptions and development of NIH grants logical and physical data models are left for subsequent data architecture efforts or specific implementation efforts. It is recognized that this model represents a subset of the data entities required to support all of NIH grants business processes and that most architecture and implementation efforts will create additional data entities that are not addressed in this version of the CDM.

2 Grants CDM Overview

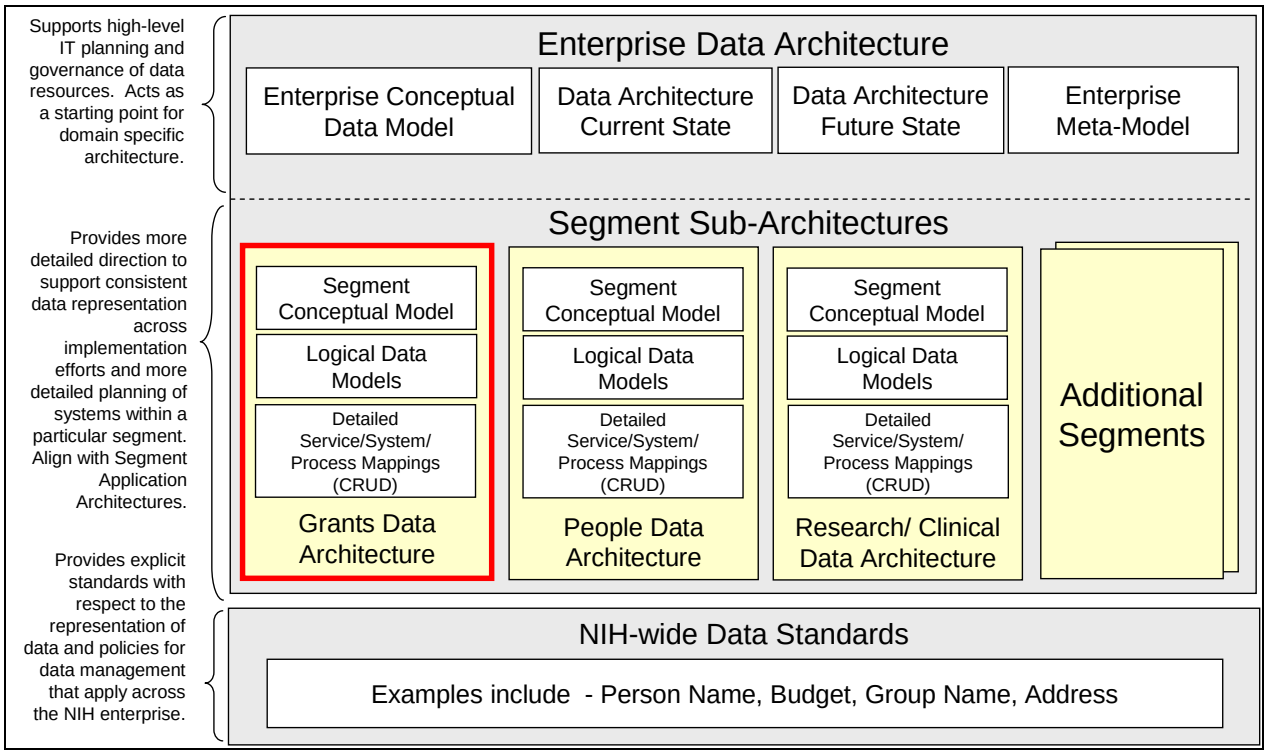
The Grants CDM documents the information requirements of the functional activity associated with the grants process. The Grants CDM supports the notion of more effective sharing of grants information in order facilitate decision making with respect to:

- Initial and ongoing funding of grants;
- The definition of the research portfolio; and
- The efficient operations of NIH grant programs.

2.1 Grants Data Architecture Overview

The Grants CDM is one component of the overall Data Architecture for grants. Grants Data Architecture is one part of the segment sub-architecture that will be developed in order to better align NIH's information systems with NIH's mission. Figure 1 shows the decomposition of data architecture and data standard components that may be used to manage NIH's data assets

Figure 1—Data Architecture Framework



The Enterprise Data Architecture identifies the key subject areas and entities that are shared across the NIH and current and future state environment supporting data management. The Enterprise CDM (NRFC0025) provides a model of the core data entities and relationships that support NIH.

The Segment Sub-Architectures are more detailed. The CDMs within individual segments allow for detailed planning in a specific business area. Also included in the segment sub-architecture

are the logical data models and data and process mappings which will not be addressed in this standard. The conceptual data model described in this document is part of the Grants segment sub-architecture.

2.2 Grants CDM Inputs

The Grants CDM was developed based on a number of key inputs:

- Grants Business Model—OCITA has developed a set of current-state business process models for grants in cooperation with grants subject matter experts from across the NIH. These models provided the basis for identifying the critical data elements that support information exchange for grants management. Fifty four (54) Subject Matter Experts (SMEs) representing 12 Institutes and Centers (ICs) participated and validated detailed business process models during this 12 month period. One dimension of the business process modeling effort was to identify which data and artifacts support the Grants business area and to record the information that the business keeps about itself and the various forms in which it is displayed and manipulated.
- Grants Business Drivers—The business drivers were developed in cooperation with NIH business leadership and represent the key imperatives that are shaping the evolution of grants business processes in the future. These drivers often have direct implications on the data architecture and the structure of the CDM. For example, the business driver to recognize the contributions of a greater number of principal investigators leads to a need to support multiple principal investigators on a single grant. This in turn dictates a many-to-one relationship between grant and principal investigator in the CDM.
- Discussions with stakeholders—The business rules and context for the entities and relationships were also vetted with business stakeholders to ensure the accuracy of the current and future direction of the grants processes and future concepts. Data model working sessions were held with individual Subject Matter Experts (SMEs) and two data model validation workshops were held which involved 30 IT and Business SMEs. After the initial publication of the draft Grants CDM, additional review sessions were held to gather additional feedback from more than 100 participants spanning a broad range of NIH organizations.

2.3 Grants CDM Content and Structure

The Grants CDM is comprised of: **Entities**, **Relationships** and **Attributes**. These components align with widely accepted nomenclature for the elements of a data model and are consistent with the approach to data description described in the Federal Enterprise Architecture (FEA) Data Reference Model (DRM). These are defined in Table 1[4].

Table 1—Grants CDM Components

Component	Description
Entities	An abstraction for a person, place, object, event or concept described (or characterized) by common Attributes. For

[4] These definitions are based on those found in the DRM version 2.0, but have been modified to reflect NIH's specific needs. The DRM version 2.0 can be found at http://www.whitehouse.gov/OMB/egov/documents/DRM_2_0_Final.pdf.

Component	Description
	example, "Grant Application" and "Grant" are Entities. An *instance* of an Entity represents one particular occurrence of the Entity, such as a specific person or a specific agency.
Relationships	Describes the association between two Entities. Relationships may also be described as business rules that specify the nature of the interaction between two Entities.
Attributes	A characteristic of an Entity whose value may be used to help distinguish one instance of an Entity from other instances of the same Entity. For example, an Attribute of a "Grant Application" Entity may be "Grant Application Identification Number."

The Grants CDM will be presented in three notations to accommodate the wide variety of stakeholders: Object Role Modeling (ORM)[5] notation, sentences or fact types, and Entity-Relationship (ER) diagrams. An explanation of how to read each is included in Appendix C – Data Modeling Tutorial. The sentence structure is included as part of each focus area and is intended to make the CDM easier to readers without a technical background. All these sentences are normative in the order of precedence of the ORM, ERD and XML Schema Definitions (XSD) models.

All entities and attributes that are specific to a focus area have been presented in a tabular form in the document. A readable version of the comprehensive grants conceptual data model (ORM version) has been presented in Appendix A – Comprehensive Grants CDM – ORM Notation. The table structure in an ER diagram is presented in Appendix B – Comprehensive Grants CDM – ERD Notation. An explanation for reading and evaluating the ORM model and sentences is provided in Appendix C – Data Modeling Tutorial. An entire glossary of all entities and attributes and the areas where they are used is listed in Appendix F – Glossary of Entities and Attributes used in Grants CDM.

The Grants CDM inherits all the related entities, attributes and relationships from the NIH Enterprise Conceptual Data Model standard (NRFC 0025/STD0012). By not including all the inherited entities, attributes and relationships in this model, the Grant CDM is able to focus exclusively on the Grants business area. This allows for the business area specific entities, attributes and relationships to be captured and easily understood.

The Grant CDM also will have business rules that will allow for unique identifiers for all entities including party, person and organization. The Grants CDM also does not include time dimensions for this version. We understand that this concept is important and, as the Grants CDM is refined for implementation, the time dimensions will be appropriately defined. The Grants CDM does not address the requirements of entities, attributes, and relationships to be mandatory and/or optional as these are dependent on the business process that uses the rules which in turn define that and many other constraints. For example, for a point in time in the business process, the assignment of an SRO is mandatory and will be required on the grant

[5] For more information on the ORM notation and interpreting ORM models see http://www.orm.net/.

application. However all activities prior to this point in time in the business process, the SRO assignment will not be required at the time of the creation of the grant application.

2.4 Key Grants CDM Entities and Structures

There are a few key concepts associated with the Grants CDM that are integral to providing the flexibility that will be needed by NIH in its management of extramural research in the future.

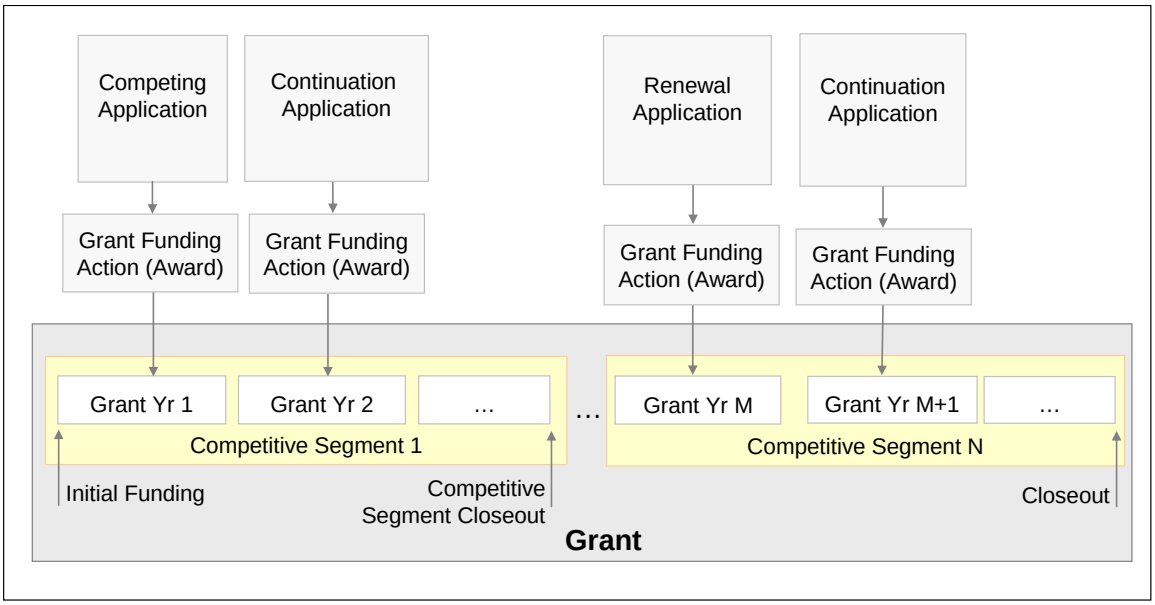
These core elements of the model are summarized in this section and are useful in understanding the remaining sections of this document. Some of the key entities represented in the model include:

- *Grant Application*—Represents the application for financial assistance from a funding organization.
- *Grant Action*—Grants are created or changed through "Grant Actions" in this model.
- *Grant Funding Action (Award)*—Within this model, a "Grant Funding Action" is a type of grant action that results in a change to the funding associated with a grant. A grant award can be thought of as a type of grant action that results in funding being allocated to a grant.
- *Grant*—For the purposes of this model, a "Grant" is the financial support provided to a research effort through its entire life cycle.
- *Grant Year*—Refers to a single fiscal year within the life of a grant.
- *Competitive Segment*—Refers to the period of grant before which the grantee must re-compete for additional funds.
- *Biomedical Research Project*—A key characteristic of this model is that the funding supporting the research, the grant, is differentiated from the actual research being conducted. The research effort is represented as a "Biomedical Research Project."

The definition of these terms may differ slightly from current common usage at NIH or may be somewhat more limited. These deviations or more precise definitions are needed in the model to ensure that each term has a single, clear meaning within the context of the model or to address structural requirements for the grouping of information that will allow for more flexibility in information systems and improved reporting in the future.

Figure 2 below illustrates the key relationships between Grant Applications, Grants, Competitive Segments and Grant Years.

Figure 2—Key Grant Structures

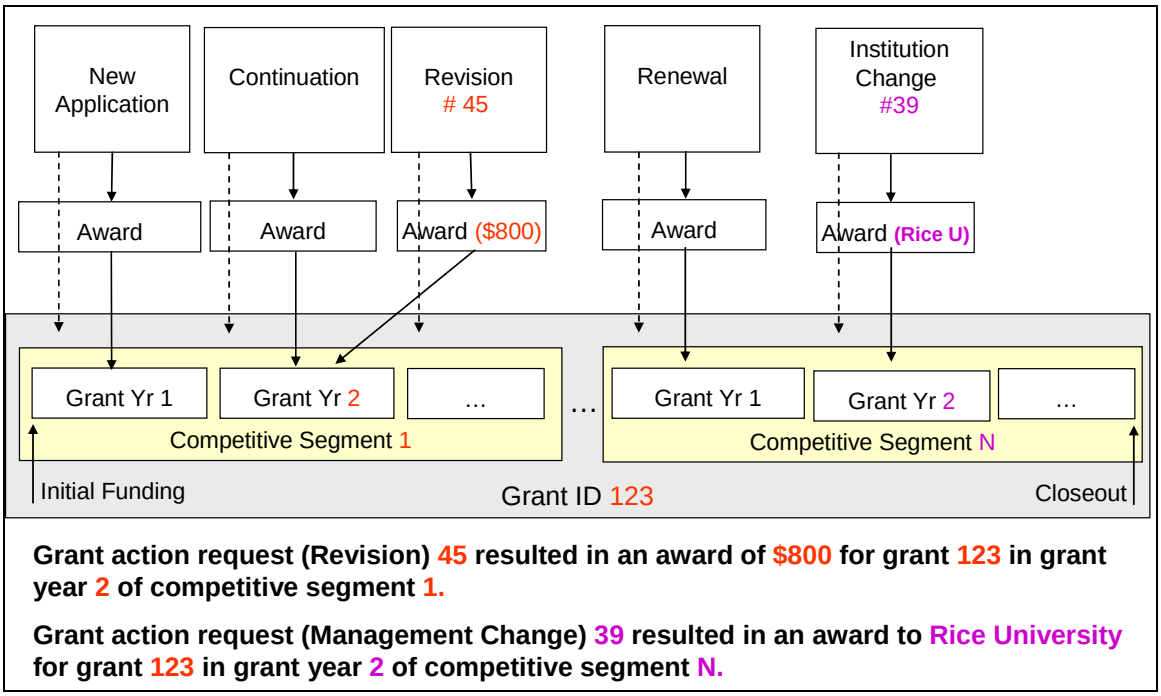


The representation of grants in the model has several key characteristics:

- The "Grant" object in the model aggregates all the information about the funding of a research effort from its initial Grant Funding Action through final closeout.
- Each "Grant Year" an application is submitted results in an award of funds as would be expected.
- All the information related to a particular grant can always be retrieved through the master "Grant" entity.

Figure 3 below shows additional detail with example data shown for key attributes. The sentences below the figure provide examples of the types of statements that are used to derive the structure and rules provided by the Grants CDM.

Figure 3—Key Grant Structure with Example Attribute Values



The Grants CDM model also addresses a number of emerging business needs currently being discussed within the NIH which include the need to support a variety of approaches for linked awards, tethered applications, complex mechanisms and other flexible relationships between the entities. The information related to these concepts has been modeled within this Grants CDM, but the process that will capture the data is still under discussion within NIH. Several examples of these concepts are explained in Appendix D – Grant Application Grouping Types.

The details of the approach to representing grant information illustrated in the figures are provided in Section 3 – Grants CDM of this document.

3 Grants CDM

This section describes the Grants CDM in detail, including definitions of all the Entities, Attributes and Relationships that comprise the model. The CDM has been decomposed into the following focus areas to support greater clarity:

1. Roles and Organizations
2. Grant Application
3. Grant
4. Grants Funding and Management
5. Grant Action
6. Peer Review
7. Advisory Council

A subsection for each of these components is outlined that includes an ORM model for the component, a description of the entities, a description of the attributes assigned to those entities, and a sentence description of the relationships between the entities and/or attributes. The constraint on each relationship is abbreviated as 1:1 (one-to-one), M:1 (many-to-one), 1:M (one-to-many), or M:M (many-to-many) when the sentence is read from left to right.

A complete list of entities and attributes has been defined in Appendix F - Glossary of Entities and Attributes in the Grants CDM.

3.1 ROLES AND ORGANIZATION

3.1.1 Introduction

This section describes the structure that is used to manage people and organizations. The effective management of information about the roles individuals and organizations play in the life cycle of a grant is essential to meeting NIH's business needs which are to used for reporting purposes

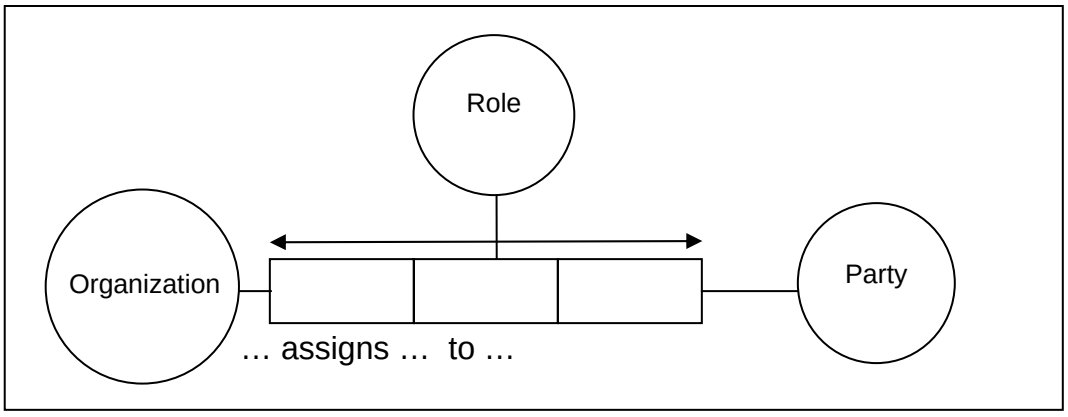
An individual person can play multiple roles, such as Scientific Review Officer, Scientific Review Director or Referral Officer, depending on the organization and timeline of the grant, etc. Each of these roles can have specific permissions and responsibilities in the activities they perform and are assigned by the organization(s) associated with a person.

Flexible definition of roles is required in order to allow NIH to effectively evolve its business processes over time. By allowing for many roles in the research activities to be tracked, NIH will be able to understand the history of the persons involved, such as principal investigator, core leader or researcher. In this model we have chosen to allow for continued flexibility and expansion of the number of roles that NIH manages about the Grants business area. This flexibility also allows NIH to create those yet to be identified roles within the NIH Grants business area without additional change to the data structures.

These concepts are used throughout the Grants CDM to describe the relationships between people and grants, grant applications and administrative activities. It is important to understand the basic structure of roles and their relationship to parties and organizations in order to fully understand the other areas of the Grants CDM.

There are some key relationships between parties' (people or organizations) roles, and the organizations that assign them. Figure 4 shows the basic structure of these relationships.

Figure 4—Role, Organization, Party Structure



As shown in the Figure 4 an organization assigns a role to a party (defined later in this section)

A role will typically be assigned with respect to some other entity within the model. Examples of the types of relationships used to represent the relationships between roles and other entities include:

- Grant application has role played by person
- Grant application has research institution with role played by person.
- Grant has role played by person.

This flexible structure will allow new roles to be added to grant activities without the need to change the structure of the data model. Creating a separate entity in the model for each role in a grants process would limit the flexibility of role assignment, and require changes in data structure to add roles. Instead, this model allows new roles to be added by simply changing the data stored about roles. More than one person can fulfill any role and a person can also fulfill many roles.

This model does not specify when a particular role is assigned in the processes supporting grants management. The timing of role assignment will be driven by the NIH's business processes and policies. Constraints on the person playing a role will be presented for each rule includes a role assignment.

The set of roles for organizations are simpler and better defined than the set of roles for people. Therefore, the roles played by organizations are explicitly specified in the model. For example:

- A Grant Application is reviewed by an IRG.
- A Grant is funded by a Funding Organization.
- A Grant is provided to a Grantee.

The Grants CDM does not require that the rules for roles be implemented in this flexible manner, but it provides the foundation for systems to be flexible enough to allow for the assignment of future roles in an efficient manner.

3.1.2 Roles and Organization—Data Entities and Attributes

Table 2 shows the main objects that have been defined as part of the Roles and Organization. These are the high level objects that represent the relationships between Party, Person and Organization and the role they play in the Grants business area.

All of these entities have been defined as part of the Grants CDM as related to the Roles and Organization. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard)
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH whenever possible.
- *Source:* The point of origin for the definitions identified within this standard.

Table 2—Role and Organization—CDM Objects

#	Name	Definition	Source
1	**Party**	Information about people, organizations and other actors in NIH processes, and their roles.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
2	*Party ID*	*A unique identifier of a Party.*	*OCITA*
3	*Party Type*	*An indicator to reflect as belonging to a member of a higher class. Examples include person or organization.*	*OCITA*
4	**Organization**	A formal grouping of people and/or business units coordinated to perform a specific purpose or obtain a specified objective.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
5	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
6	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
7	*RoleName*	*A short description specifying the role.*	*OCITA*

Table 3 shows a representative set of known and allowable roles within the Grant business area and relationships with the objects. We have provided an example of how to read these constraints in English and also provided the technical rules for the set of known and allowable roles that can interact with the object.

Table 3—Roles and Organization—Allowable Roles associated with Objects

#	Object	Constraint	Allowed Role(s)	Role Object
1	A single Advisory Council Board may have many Members. A member may belong to at most one Advisory Council Board			
	Advisory Council Board	M:1	Member	Person
2	An Advisory Council Board has at most one Chairperson. A Chairperson may chair many Advisory Council Boards			
	Advisory Council Board	1:M	Chairperson Acting Chairperson Council Executive Secretary	Person
3	Advisory Council Board Meetings may have many Attendees. Attendees may attend many Advisory Council Board Meetings			
	Advisory Council Board Meeting	M:M	Attendee	Person
4	Competitive Segment Closeout is managed by one Grants Management Specialist. Grants Management Specialist may manage many Competitive Segment Closeouts.			
	Competitive Segment Closeout	1:M	Grants Management Specialist Scientific Program Manager Grants Management Official	Person
5	Funding Grant Action is performed by one Grant Management Official. Grant Management Official may perform many Funding Grant Actions.			
	Funding Grant Action	1:M	Grant Management Official	Person [Funding Organization]
6	Funding Grant Action is performed by one Leads Grant Management Official. Leads Grant Management Official may perform many Funding Grant Actions			
	Funding Grant Action	1:M	Lead Grants Management Official	Person
7	A Grant can be worked on by many Principal Investigators. Principal Investigators may work on many Grants			
	Grant	M:M	Principal Investigator Researcher Key Personnel Trainee	Person [Research Institution]
8	A Grant has one Contact Principal Investigator. A Contact Principal Investigator may work on many Grants			
	Grant	1:M	Contact Principal Investigator Fellow SubGrant (Project) Leader Core Leader Signing Official Business Office Contact Grants Management Specialists Scientific Program Manager	Person
9	A Grant Application can have many Principal Investigators. A Principal Investigator may be named on many Grants Applications.			
	Grant Application	M:M	Principal Investigator Researcher Key Personnel Trainee	Person [Research Institution]
10	A Grant Application has one Contact Principal Investigator. A Contact Principal Investigator may be named on many Grant Applications.			

#	Object	Constraint	Allowed Role(s)	Role Object
	Grant Application	1:M	Contact Principal Investigator Fellow SubGrant (Project) Leader Core Leader Signing Official Business Office Contact Grants Management Specialists Scientific Program Manager	Person
12	A Grant Application Review Result can be provided by a single Reviewer One. Reviewer One may provide many Grant Application Review Results.			
	Grant Application Review Result	1:M	Reviewer One Reviewer Two Reviewer Three Reviewer n	Person
13	An Integrated Review Group can have at least one Chief. A Chief can be chief of many Integrated Review Groups.			
	Integrated Review Group	1:M	Chief	Person
13	A Pay plan can be approved by a Grant Final Approval Official. Grant Final Approval Official may approve many Pay plans.			
	Pay plan	1:M	Grant Final Approval Official	Person
14	A Scientific Review Group can have at least one Scientific Review Officer. A Scientific Review Officer can be manager of many Scientific Review Groups.			
	Scientific Review Group	1:M	Scientific Review Officer	Person
15	A single Scientific Review Group may have many Members. A Member may belong to many Scientific Review Groups			
	Scientific Review Group	M:M	Member	Person
16	A Scientific Review Group has at most one Chairperson. A Chairperson may chair many Scientific Review Groups.			
	Scientific Review Group	1:M	Chairperson Acting Chairperson Scientific Review Officer Extramural Support Assistant	Person
17	Scientific Review Group Meetings may have many Attendees. Attendees may attend many Scientific Review Group Meetings			
	Scientific Review Group Meeting	M:M	Attendee	Person

Table 4 shows the organizations and their definitions and Table 5 provides the definitions for the roles that have been allowed in this model.

Table 4—Organization—CDM Entities

#	Name	Definition	Source
1	**Advisory Council/Board**	Chartered NIH institute advisory committee that performs second level peer review, makes funding and policy recommendations, and helps develop research agendas. In addition to grants advisory action, additional boards may exist such as the Advisory Council to the Director (ACD), which is made up of external experts who are to assist the NIH Office of Director in creation of major plans and policies, especially those related to allocation of NIH funds and resources (for example, pioneer awards). Advisory Board is interchangeably used with Advisory Council.	NIAID Glossary of Funding and Policy Terms and Acronyms
2	**Administering Organization**	The organization that is responsible for managing the grant and the associated research.	OCITA
4	**Funding Organization**	The organization that is interested in funding the research. Within NIH these are the Institutes and Centers, commonly called "ICs." There are 27 Institutes and Centers that form the National Institutes of Health (NIH), which perform other roles as well in addition to the funding of the grants.	OCITA
5	**Integrated Review Group (IRG)**	A group/collection of review study sections organized around a similar area of science that performs initial peer review in the NIH Center for Scientific Review (CSR).	NIAID Glossary of Funding and Policy Terms and Acronyms
6	**Grantee**	The organization or individual awarded a grant (received funds to conduct or currently conducting biomedical research) or cooperative agreement by NIH that is responsible and accountable for the use of the funds provided and for the performance of the grant supported project or activities. The grantee is the entire legal entity, even if a particular component is designated in the award document. The grantee is legally responsible and accountable to NIH for the performance and financial aspects of the grant supported project or activity.	eRA Glossary of Terms http://grants.nih.gov/grants/glossary.htm#F32
7	**Research Institution**	An organization that conducts biomedical research and may have agreements with the grantee in conducting specific research areas.	OCITA
8	**Scientific Review Group (SRG)**	Component of an NIH Center for Scientific Review and ICs integrated review group organized around a scientific area, which conducts initial peer review in that field. Composed of non-NIH scientific experts, study sections are managed by CSR or IC specific scientific review officers or directors. SRGs can be Chartered SRGs (or study sections) with a core of standing members, recurring Special Emphasis Panels (SEPs) or non-recurring Special Emphasis Panels.	OCITA

Table 5—Roles—CDM Entities

#	Name	Definition	Source
1	**Advisory Council Member**	A member of the standing committee in each IC who provides the second level of grant application review following the Scientific Review Group (SRG).	OCITA
2	**Attendee**	The personnel who attend the peer review meetings. This may be made up of external reviewers, SROs, etc.	OCITA

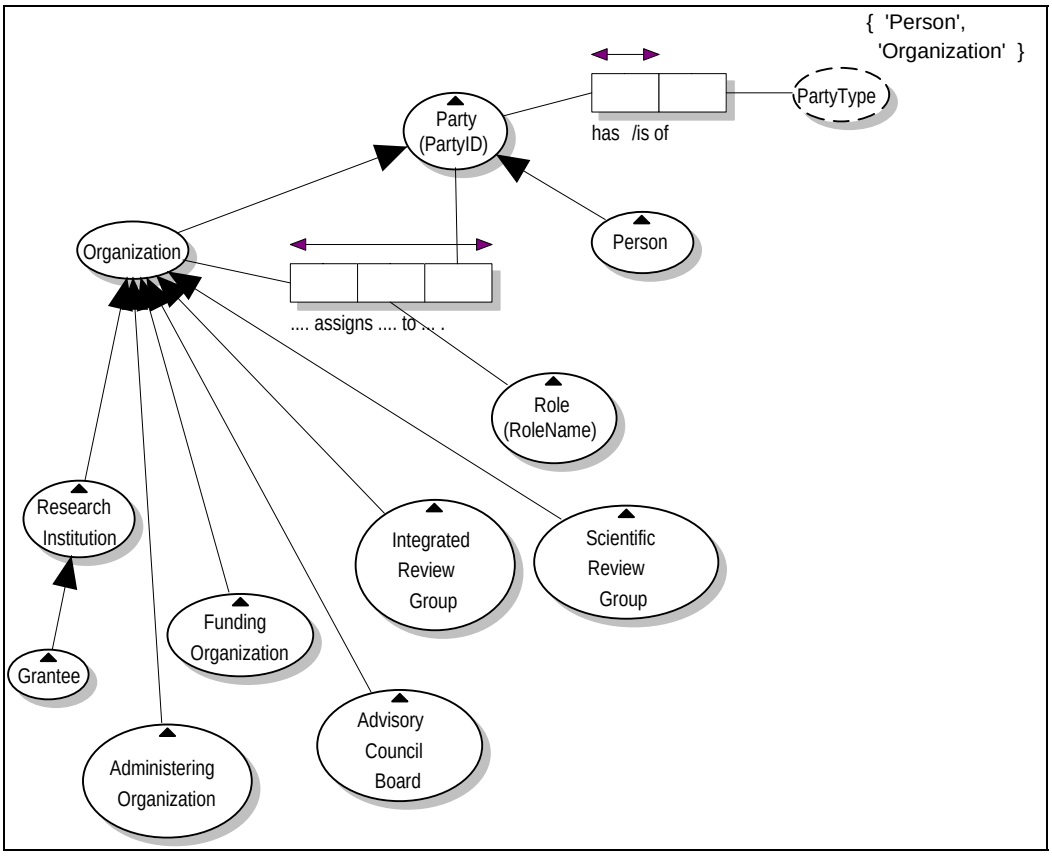
#	Name	Definition	Source
3	**Business Office Contact**	Designated personnel who are employed by the research institution to manage the business management of a particular grant.	OCITA
4	**Chairperson**	The presiding officer of an Advisory Council Board and Scientific Review Groups Under certain conditions, an Acting Chairperson may be needed	OCITA
5	**Contact Principal Investigator**	A Principal Investigator from the research institution who serves as the liaison with NIH and the research team. He/She is responsible to provide relevant information to the other PIs of a multiple PI grant award.	OCITA
6	**Core Leader**	A person who takes on a leadership role in providing essential services on a research project. A multi-project application may include two types of core leaders: scientific core leader and a single administrative core leader.	OCITA
7	**Council Executive Secretary**	An IC official who is responsible for setting the council priority and council recommended budget for grant applications eligible for an award based on Integrated Review Group (IRG) results.	OCITA
8	**Extramural Support Assistant**	While Extramural Support Assistant (ESA) is a role in multiple business areas, the definition here refers to the ESA role in the Peer Review business area. The efficient and effective management of review group requires the cooperative efforts of the Scientific Review Officer (SRO) and the Extramural Support Assistants (ESAs). The SRO works with the ESA in preparing nomination slates; in processing, assigning and mailing applications to reviewers; in preparing for and managing meetings; and in preparing summary statements. The ESA's duties include processing applications promptly after they are received in the SRG office; preparing and mailing applications and supporting materials to reviewers; making arrangements for and taking budget and action notes at SRG meetings; entering accurate SRG data into the eRA system; ensuring that summary statements are properly prepared and released; maintaining office files; preparing nomination packages; scheduling office work to meet periodic deadlines; handling administrative details in the daily management of the office; and training Grants Clerks in the procedures described above.	eRA Glossary of Terms http://era.nih.gov/aboutera/glossary.cfm#g
9	**Fellow**	The recipient of a NIH training and research program award, referred to as a fellowship, where the NIH specifies the individual receiving the award for pre-doctoral studies or post-doctoral studies.	OCITA
10	**Grant Final Approval Official**	The highest signing authority for approving the pay plan. This can be the Extramural Director of an IC and/or Director of an IC or Branch.	OCITA

#	Name	Definition	Source
11	**Grants Management Official (GMO)**	An NIH official responsible for the business management aspects of grants and cooperative agreements, including review, negotiation, award and administration, and for the interpretation of grants administration policies and provisions. Only GMOs are authorized to obligate NIH to the expenditure of funds and permit changes to approved projects on behalf of NIH. Each NIH Institute and Center that awards grants has one or more GMOs with responsibility for particular programs or awards. Sometimes also known as Grants Management Officer.	NIAID Glossary of Funding and Policy Terms and Acronyms
12	**Grants Management Specialist (GS)**	A Grants Management Specialist (GS) is an agent of the Grants Management Officer (GMO) and is assigned responsibility for the day-to-day management of a portfolio of grants. The Grants Management Specialist is the IC staff member who is the focal point for all business and policy activities associated with the negotiation, award and administration of a grant or cooperative agreement, and who interprets and applies grants policies.	eRA Glossary of Terms http://era.nih.gov/aboutera/glossary.cfm#g
13	**Lead Grants Management Official**	A Grant Management Official who serves as the final signatory authority in the case of multiple funding organizations.	OCITA
14	**Member**	An individual who belongs to peer review groups and advisory councils boards.	OCITA
15	**Principal Investigator (Program Director or Project Director) (PI)**	Any individual judged by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program supported by the grant. Each principal investigator is responsible and accountable to the grantee organization for the proper conduct of the project or program including the submission of all required reports. Qualified person who is designated by a grantee to direct a research project or program supported by NIH and who usually writes the grant application. PIs oversee scientific and technical aspects of a grant and the day-to-day management of the research. PIs do not have to be employees of a grantee organization, but these parties must have a written agreement specifying their relationship. The Grants.gov term is principal investigator/project director.	Multi-PI Workgroup NIAID Glossary of Funding and Policy Terms and Acronyms
16	**Referral Officer**	NIH or IC official responsible for overseeing the referral process.	OCITA
17	**Researcher**	An individual who performs extensive investigations and experiments to discover or revise scientific theories and facts.	OCITA
18	**Reviewer**	A person participating in the peer review process who reads a grant application thoroughly, writes and distributes a critique of it to the SRG for discussion purposes at the meeting. Reviewers can be of multiple kinds: One, Two, Three or N number. – alternatively they may be also known as primary, secondary (who serves as backup to the primary reviewer and may write a critique) and a reader (who serves as backup to the primary and secondary reviewers and does not necessarily prepare a critique) or discussers, mail reviewers and telephone reviewers.	OCITA

#	Name	Definition	Source
19	**Scientific Program Manager (Program Official)**	The NIH official responsible for the programmatic, scientific and/or technical aspects of a grant. In some ICs, the scientific program manager may also be known as Program Director, Medical Officer or Health Scientist Administrator (HSA).	NIH Glossary http://grants2.nih.gov/grants/glossary.htm
20	**Scientific Review Officer (SRO) or Scientific Review Director (SRD)**	Federal scientist who presides over a scientific review group and coordinates and reports the initial peer review of each grant application assigned to it. Scientific Review Officers act as intermediaries between PI applicants and reviewers and prepare summary statements for all applications reviewed. Also see Scientific Review Group. May also be known as Health Scientist Administrator (HSA).	NIAID Glossary of Funding and Policy Terms and Acronyms
22	**Scientific Review Group Member**	A technical professional who is assigned to review grant applications as part of a study section or scientific review group. The scientific reviewer is a type of scientific review group member and can be of multiple types: One, Two, Three. Alternatively they may be also known as primary peer reviewer, secondary peer reviewer, or a reader (tertiary peer reviewer). The reviewers are scientists who review grant applications or contract proposals. This includes the scientific review group chair, who leads the discussions.	OCITA
21	**Signing Official**	A Signing Official (SO) has institutional authority to legally bind the institution in grants administration matters. The individual fulfilling this role may have any number of titles in the grantee organization. The label “Signing Official” is used in conjunction with the NIH eRA Commons. The SO can register the institution and create and modify the institutional profile and user accounts. The SO also can view all grants within the institution, including status and award information. An SO can create additional SO accounts as well as accounts with any other role or combination of roles. For most institutions, the Signing Official (SO) is located in its Office of Sponsored Research or equivalent. The NIH term Institutional Business Official, may still be used.	http://grants.nih.gov/grants/glossary.htm#P
23	**SubGrant (Project) Leader**	A leader on a research project who has the responsibility of planning and executing the tasks associated with a portion or subset of the grant tasks.	OCITA
24	**Trainee**	Target investigators (as opposed to health professionals) in fields where there is an identified need for biomedical and behavioral research personnel receiving funding from NIH	http://grants2.nih.gov/training/career_progress/chapter1.pdf.

3.1.3 Roles and Organization—ORM Model

Figure 5: Roles and Organization



3.1.4 Roles and Organization—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level, and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 6—Roles and Organization—CDM Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Party is identified by <PartyID>.	Party is identified by **23444323.**	PartyID is unique.		
2	Party with party id <PartyID> has party type of <PartyType>.	Party with party id **23444323** has party type of **Organization.**	M:1		
3	Organization with organization id <PartyID> assigns role with role name of <RoleName> to Person with person id <PartyID>.	Organization with organization id **23444323** assigns role with role name of **Business Office Contact** to person with person id **11145378.**	M:M		

3.2 GRANT APPLICATION

3.2.1 Introduction

Applicants or Principal Investigators (PIs) submit application(s) for financial assistance from NIH to fund biomedical and/or behavioral research. Some are in response to a research agenda, initiatives and opportunity announcements, and some are unsolicited and not in response to any opportunity announcements. There are many types of grant applications which are typically divided into the general types of competing and non-competing. Competing grants are evaluated by representatives who are external to NIH. Non-competing grants are evaluated and approved by NIH personnel. Competing grant applications cover new grant applications, renewal grant applications and revisions to existing grant applications. Non-competing grant applications include continuation applications. Requested management changes also change the grant and they can come from the responsible grantee when the change involves a principal investigator, the grantee, and changes in the mechanism funding the grant and from the responsible funding organization (e.g.: NIH Institute/Center) when the funding organization is changed.

The grant application includes many critical attributes that provide further application detail. A few of those attributes such as, accession number, grant application title and abstract, grant specific aims, technical content and grant type, have been identified below. The grant application also has relationships and business rules associated with most of the entities within the Grant CDM model. These include but are not limited to: principal investigator (PI), grantee, funding organization, signing officials, and scientific program. Individual grant application types use a subset of the identified attributes.

The Grants CDM has been designed to accommodate some proposed [6]new and complex types grant applications. The grant application structures outlined here are examples of the various scenarios that could exist. The model is designed to be flexible enough to adapt to other unanticipated changes or complex structures. Appendix D – Grant Application Grouping Types describes some complex grant applications and how the Grants CDM provides the necessary rules to support them.

The terminology for the different types of grant applications is reflected in Appendix E. The Grants CDM represents attributes that signify and allow for these different types of grant applications.

[6] Tethered Application Records and High Level Requirements Documents, Results of Working Group Sessions, August – November 2006

3.2.2 Grant Application—Data Entities and Attributes

Table 7 shows the data entities that have been defined as part of the Grants CDM as related to the Grant Application. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this standard.

Table 7—Grant Application—CDM Entities and Attributes

#	Name	Definition	Source
1	**Administering Organization**	The organization that is responsible for managing the grant and the associated research.	OCITA
2	**Communication**	Any ad hoc written correspondence exchanged between the applicant and NIH during the course of the review of the grant application until it is awarded.	OCITA
3	*Communication ID*	*A unique identifier for the communications*	OCITA
4	**Financial Status Report**	Report showing the status of funds for a grant or cooperative agreement, mandatory for continued funding.	NIAID Glossary of Funding and Policy Terms and Acronyms
5	*Financial Status Report ID*	*A unique identifier for financial status report as submitted by the applicant.*	*OCITA*
6	**Funding Organization**	The organization providing funding for a grant.	OCITA
7	**Grant**	Financial assistance from Public Health Service agency for approved activities. Performance responsibility rests primarily with a grantee with little or no government involvement in the research; term covers grants and cooperative agreements. A grant starts with the initial funding of competitive segment. Each competitive segment will have a closeout. The grant will end with the closeout of the final competitive segment.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
8	*Grant ID*	*A unique identifier for a grant.*	*OCITA*
9	**Grant Action Request**	A request for an action that may create or change a grant. Examples include grant application, revisions, resubmissions, renewals, etc. On the associated grants, changes can be research institution, PI, funding organization and mechanism.	OCITA

#	Name	Definition	Source
10	**Requested Management Change**	Requested management changes to a grant application. Examples of requested changes include changes to mechanisms, research institutions, institute or center, and/or principal investigator.	OCITA
11	**Grant Application**	Application for financial assistance from a Public Health Service agency.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
12	*Activity Code*	*A code to identify the award type. General categories include research grants, contracts, training, and fellowship. Activity codes are usually grouped into mechanisms.* *Often used interchangeably with activity code.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
13	*Application Status*	*The condition signifying the progress of a grant application in its life cycle from receipt to award.*	*OCITA*
14	*Competing Application Flag*	*An indicator to show the whether the grant application is competing or noncompeting when submitted.*	*OCITA*
15	*Grant Abstract*	*A complete description of what the proposed research intends to accomplish. This description becomes the current abstract of the Grant after funding.*	*OCITA*
16	*Grant Application ID*	*An identifier for a grant application that is not derived from other information about the Grant.* *Note: The current Grant Number as implemented in eRA and other NIH systems is derived from other information about the grant. In the future, it is useful to have an ID that does not contain such information. This will result in more flexible systems.* *This is not intended to reflect the current systems identifier.*	*OCITA*
17	*Grant Application Grouping Role*	*A role played by the grant application within a grouping.* *For example—a lead grant application or a supporting grant application.*	*OCITA*
18	*Grant Narrative Abstract*	*A written abstract that describes the public health relevance of the proposed research in layman's terms.*	*OCITA*
19	*Grant Specific Aims*	*Statement of the objectives and milestones of a research project in a grant application.*	*OCITA*
20	*Grant Technical Content*	*The section of a grant application that specifies the research effort that is to be undertaken.*	*OCITA*
21	*Grant Title*	*The title of the Grant Application that becomes the current Title of the Grant after the grant is funded.*	*OCITA*
22	*Grant Year*	*The sequence year of funding of a grant's competitive segment.*	*OCITA*

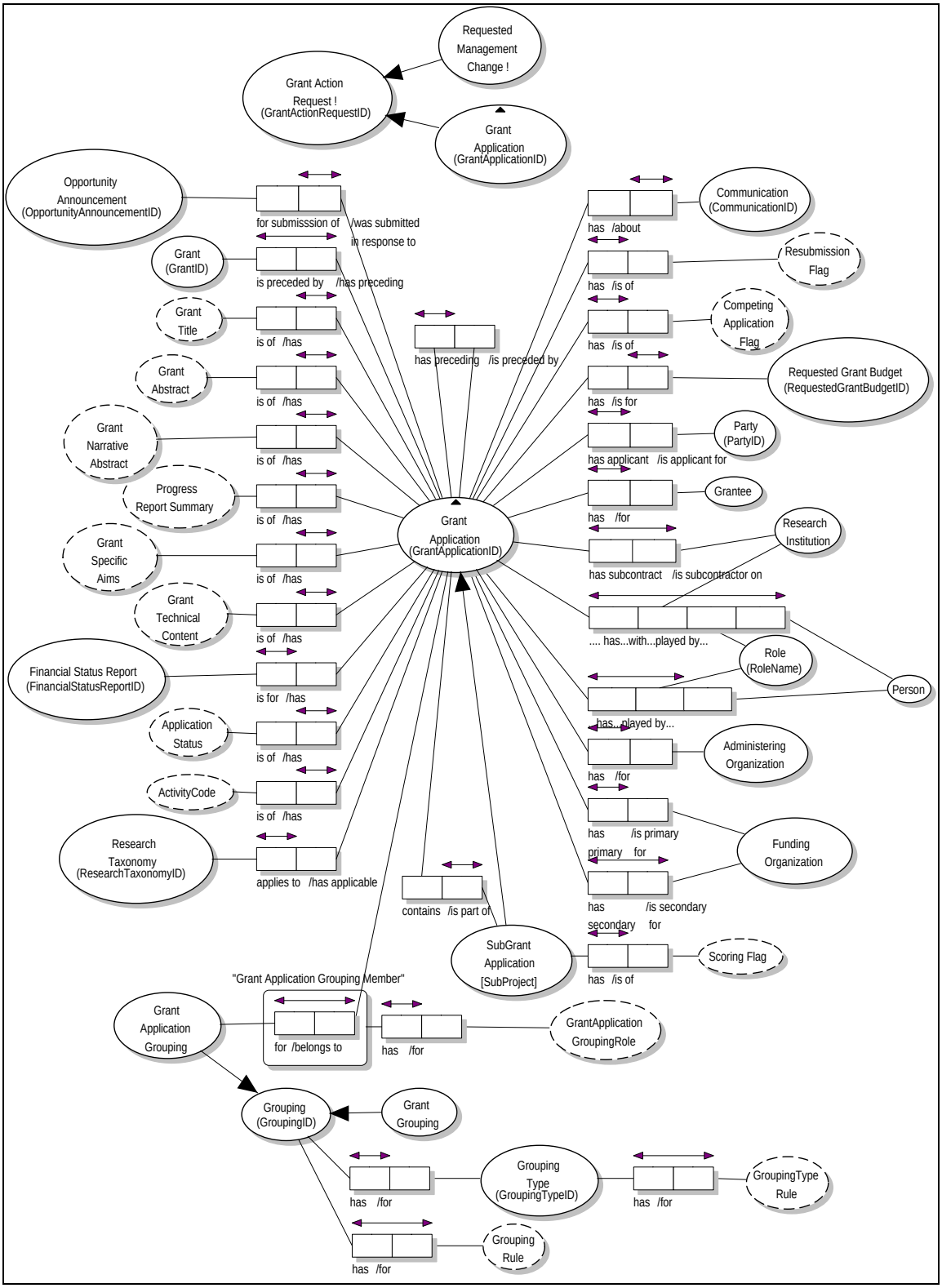
#	Name	Definition	Source
23	*Progress Report Summary*	*A summary of research work conveying the technical accomplishments on the grant and submitted by the grantee (research institution or individual).*	*OCITA*
24	*Resubmission Flag*	*An indicator to show whether the grant application is a resubmission of a previous application.* *Examples: S1 and S2.*	*OCITA*
25	**Competing Grant Application**	A grant application that must undergo a peer review**.**	OCITA
26	*Conflict Of Interest Type*	*A type of conflict of interest that people have with a grant application.. NIH provides regulations to ensure employees, scientific review group members and advisory council members or other having the ability to influence funding decision have no personal interest in the outcomes* *The types of conflicts of interest could be financial, career, including interests of family members that could be advanced by participation on advisory boards/councils.*	*OCITA*
27	*Council Result*	*The funding and policy result for an individual application provided by the Advisory Council based on the second level review.*	*OCITA*
28	*Intent To Pay Value*	*The amount obligated by authorized funding organization staff for the funding of a research grant.*	*OCITA*
29	*Priority Score*	*Average of individual ratings of scientific merit given by reviewers of an initial peer review scientific review group. Priority scores range from 100 (outstanding) to 500 (acceptable).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
30	**Integrated Review Group (IRG)**	A group/collection of review study sections organized around a similar area of science that performs initial peer review in the NIH Center for Scientific Review (CSR).	NIAID Glossary of Funding and Policy Terms and Acronyms
31	**Party**	Information about people, organizations and other actors in NIH processes, and their roles.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
32	*Party ID*	*A unique identifier of a Party.*	*OCITA*
33	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012

#	Name	Definition	Source
34	**Opportunity Announcement (OA)**	A funding opportunity announcement (FOA) is a notice in Grants.gov of a federal grant funding opportunity. Grants.gov lets organizations apply for grants for over 1,000 grant programs from 26 federal agencies. NIH FOAs can be program announcements or requests for applications (RFAs). An official announcement from NIH of a grant or contract research opportunity for which interested parties may apply.	NIAID Glossary of Funding and Policy Terms and Acronyms and NIH Enterprise Conceptual Data Model NRFC0025/STD0012
35	*OpportunityAnnouncementID*	*A number assigned to the Grants.gov notice of a federal grant funding opportunity at NIH. FOAs can be Request for Applications (RFAs) or Program Announcements (PAs).*	*OCITA*
36	**Requested Grant Budget**	An amount (including direct and indirect costs) applied for in the grant application by the applicant to conduct the research. The pay plan requested budget item may be a line item in this budget plan.	OCITA
37	*Requested Grant Budget ID*	*A unique identifier for the grant budget as requested by the applicant.*	*OCITA*
38	**Research Institution**	An organization that conducts biomedical research and may have agreements with the grantee to conduct specific research areas..	OCITA
39	**Research Taxonomy**	A system of classification for medical research that structurally defines the research areas of interest or other categorizations for research. This will also include disease categories	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
40	*Research Taxonomy ID*	*A unique identifier for the research taxonomy.*	*OCITA*
41	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
42	*RoleName*	*A short description specifying the role.*	*OCITA*
43	**Scientific Review Group (SRG)**	Component of an NIH Center for Scientific Review and ICs integrated review group organized around a scientific area, which conducts initial peer review in that field. Composed of non-NIH scientific experts, study sections are managed by CSR or IC specific scientific review officers or directors. SRGs can be Chartered SRGs (or study sections) with a core of standing members, recurring Special Emphasis Panels (SEPs) or non-recurring Special Emphasis Panels.	NIAID Glossary of Funding and Policy Terms and Acronyms
44	**SubGrant Application**	A grant application that is submitted as part of another grant but may be independently reviewed and awarded. This is similar to a grant application (for title and summary) and must be tied to a specific grant application. This is an expansion of the current concept for sub-projects and includes additional rules for grouping of grant applications	OCITA

#	Name	Definition	Source
45	*Scoring Flag*	*An indicator to specify whether the subgrant application has to be scored individually during the review process.*	*OCITA*
46	**Grouping**	An aggregation of grant applications and/or grants that are managed together; possibly because they are related in the science. This reflects the emerging needs of NIH to support collaborative science and examples include one-to-many and clustered applications. This flexible grouping allows for complex mechanisms.	OCITA
47	**Grant Application Grouping**	A collection of *grant applications* that are managed together; possibly because they are related in the science.	OCITA
48	**Grant Grouping**	A collection of the *grants* that are managed together; the grouping may follow or may be independent of associated grant application grouping.	OCITA
49	*Grouping ID*	*A unique identifier of a grouping*	*OCITA*
50	*Grouping Rules*	*A collection of rules that provide the basis for the relationships of a grouping.*	
51	**Grouping Type**	An indicator that defines reused rules for a grouping. Examples include: one-to-may and clustered.	OCITA
52	*Grouping Type ID*	*A unique identifier for grouping type*	*OCITA*
53	*Grouping Type Rules*	*A collection of reused rules that provide the basis for the relationships of the grouping type.*	*OCITA*
54	**Grant Application Grouping Member**	A record of the membership of a grant application in a grant application grouping.	OCITA
55	*Grant Application Grouping Role*	*A role played by the grant application within a grouping.* *For example, a lead grant application or a supporting grant application.*	*OCITA*

3.2.3 Grant Application—ORM Model

Figure 6—Grant Application



3.2.4 Grant Application—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 8—Grant Application—CDM Relationships and Rules

	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Grant action request is identified by grant action request id <GrantActionRequestID>.	Grant action request is identified by grant action request id **0444444789.**	GrantActionRequestID is unique.		This number applies to all grant action requests.
2	Grant application is identified by grant application id <GrantApplicationID>.	Grant application is identified by grant application id **0123456789.**	GrantApplicationID is unique.		This number applies to the grant application only.
3	Grant action request <GrantActionRequestID> has grant application <GrantApplicationID>.	Grant action request **0444444789** has grant application **0123456789.**	1:1		
4	Grant application with grant application id <GrantApplicationID> has grant title of <GrantTitle>.	Grant application with grant application id **0123456789** has grant title of **"The Study…"**.	M:1		Is there a restriction for a grant title to be unique for a review round?
5	Grant application with grant application id <GrantApplicationID> has preceding grant application with grant application id <GrantApplicationID>.	Grant application with grant application id **0123456789** has preceding grant application with grant application id **0123455555.**	M:1		
6	Grant application with grant application id <GrantApplicationID> has preceding grant with grant id <GrantID>.	Grant application with grant application id **0123456789** has preceding grant with grant id **045643219.**	M:1		
7	Grant application with grant application id <GrantApplicationID> was submitted in response to opportunity announcement with opportunity announcement id of	Grant application with grant application id **0123456789** was submitted in response to opportunity announcement with opportunity announcement id	M:1		All applications coming through grants.gov are in response to some FOA. This is different from the way NIH currently does

	Relationship/Rule	Example	Constraint	Assumption	Comment
	<OpportunityAnnouncementID>.	of **3342-06.**			business. RFA-HD-07-010
8	Grant application with grant application id <GrantApplicationID> has grant abstract of <GrantAbstract>.	Grant application with grant application id **0123456789** has grant abstract of **"Our grant's purpose is applied statistical research on effects of environmental factors on cancer…"**.	M:1		
9	Grant application with grant application id <GrantApplicationID> has grant narrative abstract of <GrantNarrativeAbstract>.	Grant application with grant application id **0123456789** has grant narrative abstract of **"The effect of environmental factors on cancer…"**.	M:1		
10	Grant application with grant application id <GrantApplicationID> has grant specific aims of <GrantSpecificAims>.	Grant application with grant application id **0123456789** has grant specific aims of **"Correlate the characteristics of staphylococcus with production of …"**.	M:1		
11	Grant application with grant application id <GrantApplicationID> has grant technical content of <GrantTechnicalContent>.	Grant application with grant application id **0123456789** has grant technical content of **"Recent developments…"**	M:1		
12	Grant application with grant application id <GrantApplicationID> has progress report summary of <ProgressReportSummary>.	Grant application with grant application id **0123456789** has progress report summary of **"The approach…"**	M:1		
13	Grant application with grant application id <GrantApplicationID> has financial status report with financial status report id of <FinancialStatusReportID>.	Grant application with grant application id **0123456789** has financial status report of **674846.**	M:1		
14	Grant application with grant application id <GrantApplicationID> has application status of <ApplicationStatus>.	Grant application with grant application id **0123456789** has application status of **NRFC.**	M:1		
15	Grant application with grant application id <GrantApplicationID> has Activity Code of <ActivityCode>.	Grant application with grant application id **0123456789** has activity code of **R01.**	M:1		

	Relationship/Rule	Example	Constraint	Assumption	Comment
16	Grant application with grant application id <GrantApplicationID> has applicable research taxonomy code with Research Taxonomy id of <ResearchTaxonomyID>.	Grant application with grant application id **0123456789** has applicable research taxonomy with research taxonomy id of **12345.**	1:M		More modeling is required for research taxonomies used to categorize research. In this model, the research taxonomy code is a placeholder until a refined model for research taxonomy is developed.
17	Grant application with grant application id <GrantApplicationID> has communication with communication id of <CommunicationID>.	Grant application with grant application id **0123456789** has communication with communication id of **45663.**	1:M		
18	Grant application with grant application id <GrantApplicationID> has resubmission flag of <ResubmissionFlag>.	Grant application with grant application id **0123456789** has resubmission flag of **Yes.**	M:1		
19	Grant application with grant application id <GrantApplicationID> has competing application flag of <CompetingApplicationFlag>.	Grant application with grant application id **0123456789** has competing application flag of **Yes.**	M:1		
20	Grant application with grant application id <GrantApplicationID> has requested grant budget with requested grant budget id of <RequestedGrantBudgetID>.	Grant application with grant application id **0123456789** has requested grant budget with requested grant budget id of **443367.**	M:1		
21	Sub-grant application with grant application id <GrantApplicationID> is part of grant application with grant application id <GrantApplicationID>.	Sub-grant application with grant application id **0123456789** is part of grant application with grant application id **1254232885.**	M:1		
22	Sub-grant application with grant application id <GrantApplicationID> has scoring flag of <ScoringFlag>.	Grant with grant application id **0123456789** has scoring flag of **Yes.**	M:1		
23	Grant application with grant application id <GrantApplicationID> has role with role name of <RoleName> played by party with party id <PartyID>.	Grant with grant application id **0123456789 has** role with role name of **Applicant** played by party with party id **125423333.**	M:1		

	Relationship/Rule	Example	Constraint	Assumption	Comment
24	Grant application with grant application id <GrantApplicationID> has grantee with organization id <PartyID>.	Grant application with grant application id **9876543210** has grantee with organization id **125092288.**	M:1		
25	Grant application with grant application id <GrantApplicationID> has subcontract to research institution with organization id <PartyID>.	Grant application with grant application id **0123456789** has subcontract to research institution with organization id **135423908.**	M:M		
26	Grant application with grant application id <GrantApplicationID> has research institution with organization id <PartyID> with role with role name of <RoleName> played by person with person id <PartyID>.	Grant application with grant application id **0123456789** has research institution with organization id **3336528197** with role with role name of **Principal Investigator** played by person with person id **0123447768.**	M:M		
27	Grant application with grant application id <GrantApplicationID> has role with role name of <RoleName> played by person with party id <PartyID>.	Grant application with grant application id **0123456789** has role with role name of **Applicant** played by person with person id **125423333.**	M:1		
28	Grant application with grant application id <GrantApplicationID> has administering organization with organization id <PartyID>.	Grant application with grant application id **0123456789** has administering organization with organization id **234688234.**	M:1	Assignment made by the assigned referral officer.	
29	Grant application with grant application id <GrantApplicationID> has primary assignment to funding organization with organization id <PartyID>.	Grant application with grant application id **0123456789** has primary assignment to funding organization with organization id **234688234.**	M:1	Assignment made by the assigned referral officer.	There is no history of who was assigned primary and which referral officer did the assignment.
30	Grant application with grant application id <GrantApplicationID> has secondary assignment to funding organization with organization id <PartyID>.	Grant application with grant application id **0123456789** has secondary assignment to funding organization with organization id **23411534.**	M:M; The primary funding organization is excluded from being a secondary.	Assignment made by the assigned referral officer.	There is no history of who was assigned secondary and which referral officer did the assignment.
31	Competing grant application with grant application id <GrantApplicationID> references	Competing grant application with grant application id **555456** references grant with	M:1	Submitting grant must be Grant Type 2.	

	Relationship/Rule	Example	Constraint	Assumption	Comment
	grant with grant id of <GrantID>**.**	grant id **324115.**			
32	Person with person id <PartyID> has conflict of interest on grant application with competing grant application id <GrantApplicationID> with conflict of interest type of <ConflictOfInterestType>.	Person with person id **2351772345** has conflict of interest on grant application with competing grant application id **0123456789** with conflict of interest type of **collaborator.**	M:M	Conflict of interest is established by the assigned referral officer or the assigned scientific review officer.	A person can be both internal and external.
33	Competing grant application with grant application id <GrantApplicationID> is assigned to integrated review group with organization id <PartyID>.	Competing grant application with grant application id **0123456789** is assigned to integrated review group with organization id **23444323.**	M:1	Assignment made by the assigned referral officer.	
34	Competing grant application with grant application id <GrantApplicationID> is assigned to scientific review group with organization id <PartyID>.	Competing grant application with grant application id **0123456789** is assigned to scientific review group with organization id **23411534.**	M:1	Assignment made by the assigned referral officer.	
35	Competing grant application with grant application id <GrantApplicationID> received a priority score of <PriorityScore>.	Grant application with grant application id **0123456789** received a priority score of **234.**	M:1		
36	Competing grant application with grant application id <GrantApplicationID> has intent to pay value of <IntentToPayValue>**.**	Grant application with grant application id **0123456789** has intent to pay value of **Yes**.	M:1	Funding organization that is primary for the grant sets this flag.	
37	Competing grant application with grant application id <GrantApplicationID> has a council result of <CouncilResult>.	Grant application with grant application id **0123456789** has a council result of **intent to award.**	M:1		
38	Grouping is identified by grouping id <GroupingID>.	Grouping is identified by grouping id **22346.**	GroupingID is unique		
39	Grant application grouping member is identified by a grant application with grant application id	Grant application grouping member is identified by a grant application with grant	M:M		

	Relationship/Rule	Example	Constraint	Assumption	Comment
	<GrantApplicationID> and a grouping with grouping id <GroupingID>.	application id **0123456789** and a grouping with grouping id **22346.**			
40	Grant application grouping member having grant application with grant application id <GrantApplicationID> belonging to grouping with grouping id <GroupingID> has grant application grouping role of <GrantApplicationGroupingRole>.	Grant application grouping member having grant application with grant application id **0123456789** belonging to grouping with grouping id **22346** has grant application grouping role of **Lead.**	M:1		
41	Grouping with grouping id <GroupingID> has grouping type with grouping type id of <GroupingTypeID>.	Grouping with grouping id **22346** has grouping type of **234.**	M:1		
42	Grouping with grouping id <GroupingID> has grouping rule of <GroupingRule>.	Grouping with grouping id **22346** has grouping rule of **xxx.**	M:M		
43	Grouping type with grouping type id <GroupingID> has grouping type rule of <GroupingRule>.	Grouping with grouping id **234** has grouping type rule of **"Only one lead role."**	M:M		

3.3 GRANT

3.3.1 Introduction

The initial funding action establishes a Grant that is the vehicle for managing the technical research. Grant for the purposes of this model, is defined as the financial support provided to a research effort through its entire lifecycle. Many current grant attributes are obtained from the set of grant actions that have been approved. The grant is periodically closed out when a competitive segment ends and the grant must again compete for future funding. A grant is part of a research project that promotes a specific area of medical science.

The results of the grant research are described by the PI and the Grantee in periodic reports such as quarterly reports, invention reports, financial status reports, progress reports or applications for continuation, and additional audit requirements.

After each competitive segment, and at the conclusion of the research project, the grantee submits grant closeout reports.

3.3.2 Grant—Data Entities and Attributes

Table 9 shows the data entities that have been defined as part of the Grants CDM as related to the Grant. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this standard.

Table 9—Grant—CDM Entities and Attributes

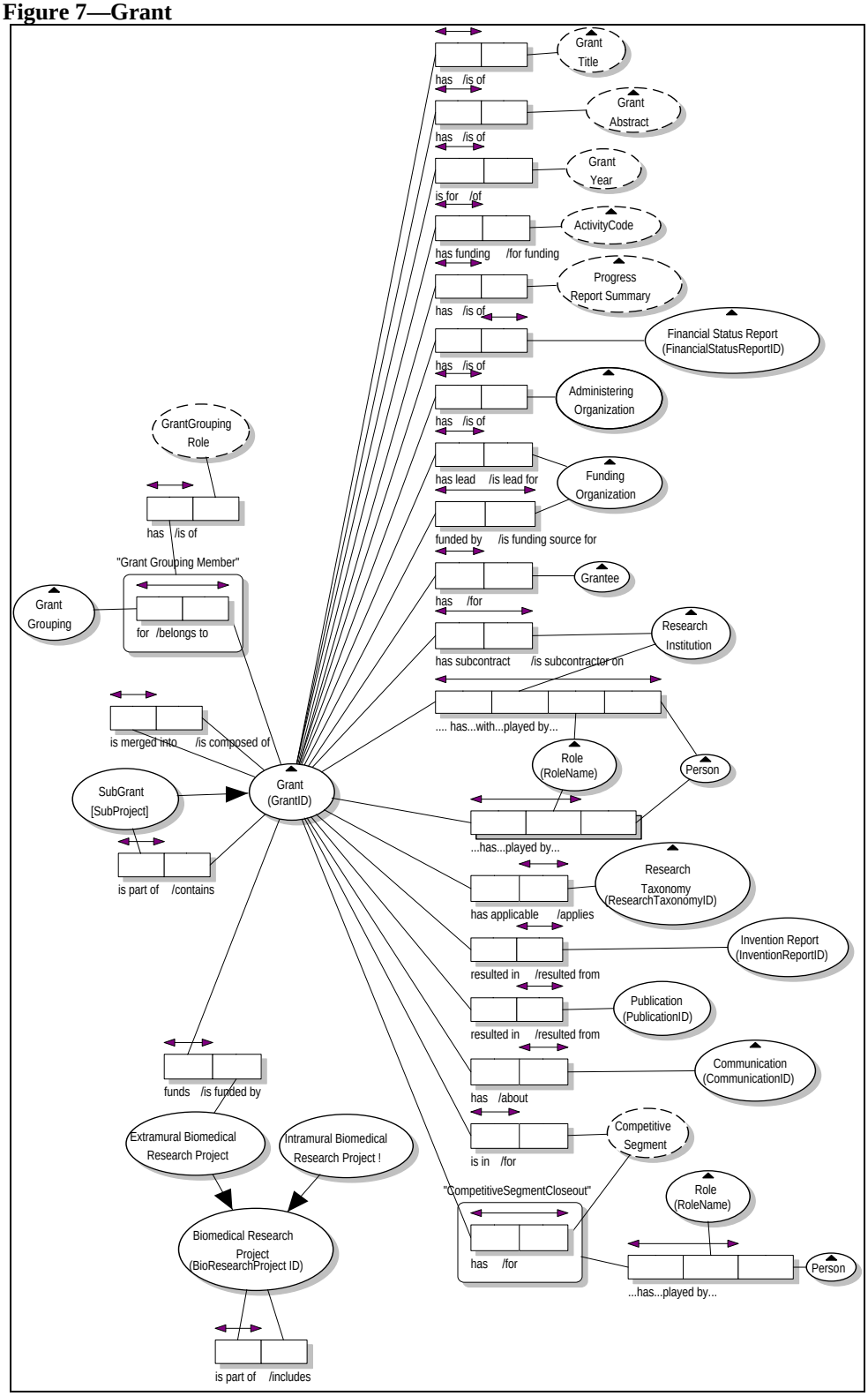
#	Name	Definition	Source
1	**Biomedical Research Project**	A basic and clinical investigation in biology or medicine.	Enterprise CDM NRFC 0025
2	**Extramural Biomedical Research Project**	A biomedical research project funded by NIH and performed outside of NIH.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
3	**Intramural Biomedical Research Project**	A biomedical research project performed within NIH.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
4	**Administering Organization**	The organization that is responsible for managing the grant and the associated research.	OCITA
5	**Communication**	Any ad hoc written correspondence exchanged between the applicant and NIH during the course of the review of the grant application until it is awarded.	OCITA
6	*Communication ID*	*A unique identifier for the communications*	OCITA
7	**Competitive Segment Closeout**	Procedure to officially conclude a competitive segment after the end of a competitive segment. Program staff determines whether administrative actions and required work are complete and have been documented according to federal records management requirements.	NIAID Glossary of Terms
8	**Financial Status Report**	Report showing the status of funds for a grant or cooperative agreement, mandatory for continued funding.	NIAID Glossary of Funding and Policy Terms and Acronyms
9	*Financial Status Report ID*	*A unique identifier for financial status report as submitted by the applicant.*	*OCITA*
10	**Funding Organization**	The organization that is interested in funding the research. Within NIH these are the Institutes and Centers, commonly called “ICs.” There are the 27 Institutes and Centers that comprise the National Institutes of Health (NIH), which perform other roles as well in addition to the funding of the grants.	OCITA
11	**Grant**	Financial assistance from Public Health Service agency for approved activities. Performance responsibility rests primarily with a grantee with little	NIH Enterprise Conceptual Data Model NRFC0025/STD0012

#	Name	Definition	Source
		or no government involvement in the research; term covers grants and cooperative agreements. A grant starts with the initial funding of a competitive segment. Each competitive segment will have a closeout. The grant will end with the closeout of the final competitive segment.	
12	*Activity Code*	*A code to identify the award type. General categories include research grants, contracts, training, and fellowship. Activity codes are usually grouped into mechanisms.* *Often used interchangeably with activity code.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
13	*Competitive Segment*	*Period of grant support before an applicant must re-compete for funds.* *A grantee must submit a renewal application for additional funds at the end of the previous competitive segment.*	*OCITA*
14	*Grant Abstract*	*A complete description of what the proposed research intends to accomplish. This description becomes the current abstract of the Grant after funding.*	*OCITA*
15	*Grant ID*	*A unique identifier for a grant.*	*OCITA*
16	*Grant Title*	*The title of the Grant Application that becomes the current Title of the Grant after the grant is funded.*	*OCITA*
17	*Grant Year*	*The sequence year of funding of a grant's competitive segment.*	OCITA
18	*Progress Report Summary*	*A summary of research work conveying the technical accomplishments on the grant and submitted by the grantee (research institution or individual).*	*OCITA*
19	**Grantee**	The recipient of the grant award (or grant funding action) can be a research institution and/or individual. The organization or individual awarded a grant (received funds to conduct or currently conducting biomedical research) or cooperative agreement by NIH that is responsible and accountable for the use of the funds provided and for the performance of the grant supported project or activities. The grantee is the entire legal entity even if a particular component is designated in the award document. The grantee is legally responsible and accountable to NIH for the performance and financial aspects of the grant-supported project or activity.	http://grants.nih.gov/grants/glossary.htm#F32
20	**Grant Grouping**	A collection of the grants that is considered to be related in the way the awards are linked.	OCITA
21	**Grant Grouping Member**	A record of the membership of a grant in a grant grouping.	OCITA
22	*Grant Grouping Role*	*The role a grant plays within a managed grouping of grants.*	OCITA
23	**Invention Report**	A report submitted to NIH to report any inventions made during the course of the grant (competing grant application or noncompeting progress report).	OCITA
24	*Invention Report ID*	*A unique identifier for the invention report submitted by the applicant.*	*OCITA*
25	**Person**	Any individual of interest to the NIH for whom the	NIH Enterprise Conceptual

#	Name	Definition	Source
		NIH maintains information.	Data Model NRFC0025/STD0012
26	**Publication**	The output of the research grants usually published as scientific papers and also updated into PUBMED (a service of the NIH Library of Medicine providing access to citations and journals)	OCITA
27	*Publication ID*	*A unique identifier for the published materials from the grant's research.*	*OCITA*
28	**Research Institution**	An organization that conducts biomedical research and may have agreements with the grantee in conducting specific research areas.	OCITA
29	**Research Taxonomy**	A system of classification for medical research that structurally defines the research areas of interest or other categorizations for research. This will also include disease categories	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
30	*Research Taxonomy ID*	*A unique identifier for the research taxonomy.*	*OCITA*
31	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
32	*RoleName*	*A short description specifying the role.*	*OCITA*
33	**SubGrant**	A subgrant may be funded directly or indirectly by a grant and includes information about participants and their roles. The subgrant may receive a specific review assignment and assessment (score and/or summary).	OCITA

3.3.3 Grant—ORM Model

Figure 7—Grant



3.3.4 Grant—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 10—Grant—CDM Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Grant with grant id <GrantID> has grant title of <GrantTitle>.	Grant with grant id **9876543210** has grant title of **"The Study…"**	M:1 Derived from Grant Application		
2	Grant with grant id <GrantID> has grant abstract of <GrantAbstract>.	Grant with grant id **9876543210** has grant abstract of **"Every…"**.	M:1 Derived from Grant Application		
3	Grant with grant id <GrantID> has grant year of <GrantYear>.	Grant with grant id **9876543210** has grant year of **12.**	M:1		
4	Grant with grant id <GrantID> has <ActivityCode> ActivityCode.	Grant with grant id **9876543210** has **R01** Activity Code.	M:1 Derived from Grant Application		
5	Grant with grant id <GrantID> has progress report summary of <ProgressReportSummary>.	Grant with grant id **9876543210** has progress report summary of **"Significant…"**.	M:1 Derived from Grant Application		
6	Grant application with grant application id <GrantApplicationID> has financial status report with financial status report id of <FinancialStatusReportID>.	Grant application with grant application id **0123456789** has financial status report of **674846.**	M:1		
7	Grant with grant id <GrantID> has administering organization with organization id <PartyID>.	Grant with grant id **9876543210** has administering organization with organization id **245656243.**	M:1		
8	Grant with grant id <GrantID> has lead funding organization with organization id <PartyID>.	Grant with grant id **9876543210** has lead funding organization with organization id **245656243.**	M:1		
9	Grant with grant id <GrantID> is funded by funding organization with organization id	Grant with grant id **9876543210** is funded by funding organization	M:M		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	<PartyID>.	with organization id **243336243.**			
10	Grant with grant id <GrantID> has grantee with organization id <PartyID>.	Grant with grant id **9876543210** has grantee with organization id **125092288.**	M:1 Derived from Grant Application		
11	Grant with grant id <GrantID> has subcontract research institution with organization id <PartyID>.	Grant with grant id **9876543210** has subcontract research institution with organization id **125423288.**	M:M Derived from Grant Application		
12	Grant with grant id <GrantID> has research institution with organization id <PartyID> with role with role name of <RoleName> played by person with person id <PartyID>.	Grant with grant id **0123456789** has research institution with organization id **3336528197** with role with role name of **Principal Investigator** played by person with person id **0123447768.**	M:M Derived from Grant Application		
13	Grant with grant id <GrantID> has role with role name of <RoleName> played by person with party id <PartyID>.	Grant with grant id **0123456789** has role with role name of **Applicant** played by person with person id **125423333.**	M:1 Derived from Grant Application		
14	Grant application with grant application id <GrantApplicationID> has applicable research taxonomy code with taxonomy code id of <TaxonomyCodeID>.	Grant application with grant application id **0123456789** has applicable research taxonomy code with taxonomy code id of **12345.**	1:M		
15	Grant with grant id <GrantID> resulted in invention report with invention report id of <InventionReportID>.	Grant with grant id **9876543210** resulted in invention report with invention report id of **45663.**	1:M		
16	Grant with grant id <GrantID> resulted in publication with publication id of <PublicationID>.	Grant with grant id **9876543210** resulted in publication with publication id of **89765.**	1:M		
17	Grant with grant id <GrantID> has communication with communication id of <CommunicationID>.	Grant with grant id **9876543210** has communication with communication id of **45663.**	1:M		
18	Grant with grant id <GrantID> is in competitive segment <CompetitiveSegment>.	Grant with grant id **9876543210** is in competitive segment **3.**	M:1		
19	Competitive segment closeout is identified by a grant with grant id <GrantID> and a competitive segment of <CompetitiveSegment>.	Competitive segment closeout is identified by a grant with grant id **9876543210** and a competitive segment of **3.**	M:M		
20	Competitive segment closeout with a grant with grant id <GrantID> being closed out for competitive segment <CompetitiveSegment> has	Competitive segment closeout with a grant with grant id **9876543210** being closed out for competitive	M:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	role with role name of <RoleName> played by person with party id <PartyID>.	segment **3** has role with role name of **Scientific Program Manager** played by person with party id **235753433.**			
21	Biomedical research project with biomedical research project id <BiomedicalResearchProjectID> is part of biomedical research project with biomedical research project id <BiomedicalResearchProjectID>.	Biomedical research project with biomedical research project id **82333** is part of biomedical research project with biomedical research project id **78465.**	102		
22	Grant grouping member is identified by a grant with grant id <GrantID> and a grouping with grouping id <GroupingID>.	Grant grouping member is identified by a grant with grant id **9876543210** and a grouping with grouping id **21146.**	M:M Partially derived from Grant Application		
23	Grant grouping member with grant with grant id <GrantID> belonging to grouping with grouping id <GroupingID> has grant grouping role of <GrantGroupingRole>.	Grant grouping member with grant with grant id **9876543210** belonging to grouping with grouping id **21146** has grant grouping role of **Lead.**	M:1 Partially derived from Grant Application		
24	Grant with grant id <GrantID> is merged into grant with grant id <GrantID>.	Grant with grant id **9876543210** is merged into to grant with grant id **9890093210.**	M:1		
25	Sub-grant with grant id <GrantID> is part of grant with grant id <GrantID>.	Sub-grant with grant id **9908343210** is part of grant with grant id **9890093210.**	M:1		
26	Grant with grant id <GrantID> funds extramural biomedical research project with biomedical research project id <BiomedicalResearchProjectID>.	Grant with grant id **9876543210** funds extramural; biomedical research project with biomedical research project id **11183.**	M:1		

3.4 GRANTS FUNDING AND MANAGEMENT

3.4.1 Introduction

Each individual funding organization budget office determines the payplan and paylines after calculating the projected number of grants, grants budgets and monies for each fiscal year. The funding approaches vary by funding organizations. Payplans document the budgeted amount that NIH staff anticipates awarding grants under specific opportunity announcements. One or many payplans may exist under a research initiative. A research initiative generally exists for the duration of a fiscal year, but the payplan is generally for one council round. Paylines are funding cutoff points that ICs set around the beginning of each fiscal year based on the number of grants that are expected to be funded. This allows funding organizations to fund the best science as determined by the peer review process. The payplan, once signed off by the funding organization leadership, is then given to the Grants Management Branch to initiate the award process.

The expedited grant applications that are important to further a specific scientific program may be awarded even if a fundable percentile score has not been achieved.

3.4.2 Grants Funding and Management—Data Entities and Attributes

Table 11 shows the data entities that have been defined as part of the Grants CDM as related to the grants funding and management. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.)
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.)
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this NIHRFC.

Table 11—Grants Funding and Management—CDM Entities and Attributes

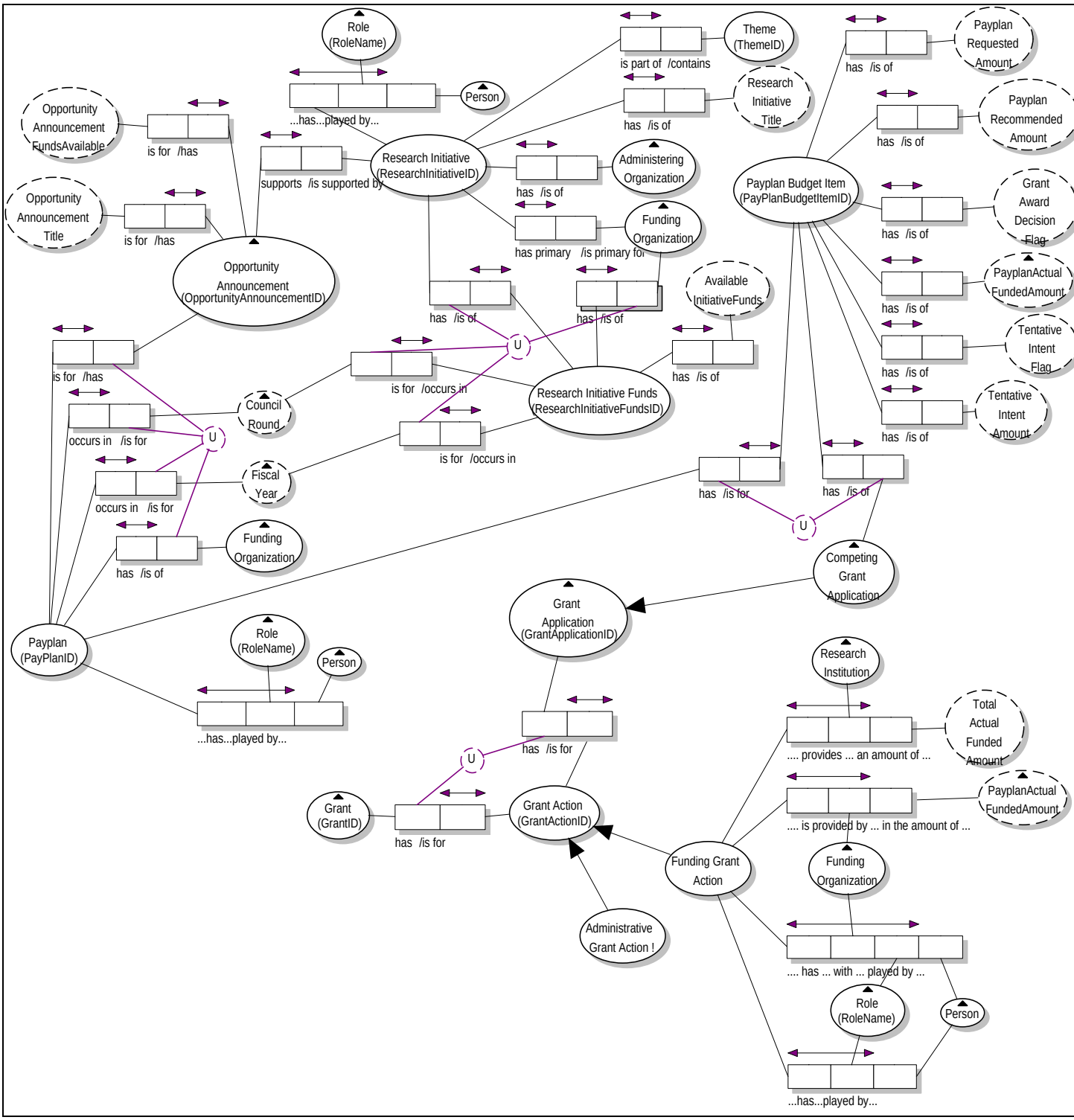
#	Name	Definition	Source
1	**Administering Organization**	The organization that is responsible for managing the grant and the associated research.	OCITA
2	**Competing Grant Application**	A new grant application that must undergo a peer review.	OCITA
3	**Funding Organization**	The organization that is interested in funding the research. Within NIH these are the Institutes and Centers, commonly called "ICs." There are the 27 Institutes and Centers that comprise the National Institutes of Health (NIH), which perform other roles as well in addition to the funding of the grants.	OCITA
4	**Opportunity Announcement (OA)**	A funding opportunity announcement (FOA) is a notice in Grants.gov of a federal grant funding opportunity. Grants.gov lets organizations apply for grants for more than 1,000 grant programs from 26 federal agencies. NIH FOAs can be program announcements or requests for applications (RFAs). An official announcement from NIH of a grant or contract research opportunity, for which interested parties may apply.	NIAID Glossary of Funding and Policy Terms and Acronyms and NIH Enterprise Conceptual Data Model NRFC0025/STD0012
5	*OpportunityAnnouncementID*	*A number assigned to the Grants.gov notice of a federal grant funding opportunity at NIH. FOAs can be Request for Applications (RFAs) or Program Announcements (PAs).*	OCITA
6	*Opportunity Announcement Funds Available*	*The amount of funds set aside when an opportunity announcement decision has been made within NIH and is published.*	*OCITA*
7	*Opportunity Announcement Title*	*The name of the opportunity announcement.*	*OCITA*
8	**Payplan**	A description of the budgetary and/or financial plans set at the beginning of the fiscal year based on the number of grants expected to be funded.	OCITA
9	*Payplan ID*	*A unique identifier for the payplan within a fiscal year.*	*OCITA*
10	*Council Round*	*At NIH, there are at least three, sometimes four,*	*OCITA*

#	Name	Definition	Source
		council rounds each fiscal year: October, January, May and sometimes August. *Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For noncompeting applications (type 3 and 5) there is the "00" council which represents a fifth cycle.*	
11	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*
12	**Payplan Budget Item**	The specific budget line item containing information about a grant application on a payplan for a fiscal year.	OCITA
13	*Payplan Budget Item ID*	*A unique identifier for the specific line item within a payplan.*	*OCITA*
14	*Grant Award Decision Flag*	*An indicator for a specific budget line item within the funding organization's payplan which has been approved for funding of a grant.*	*OCITA*
15	*Payplan Requested Amount*	*An amount noted in the grant application asking for funds to work on a research project.*	*OCITA*
16	*Payplan Recommended Amount*	*An amount suggested by the funding organization based on the received technical score that falls within the funding organizations' budget .*	*OCITA*
17	*Payplan Actual Funded Amount*	*An amount that is provided to the applicant by each funding organization which is appropriate with the project to be conducted.* *The program manager might provide the funds in the exact amount as requested or s/he may apply discretionary funds in addition to the recommended funds.*	*OCITA*
18	*Tentative Intent Amount*	*An amount of funds that are anticipated to be awarded to the applicant but have not yet been approved for funding.*	*OCITA*
19	*Tentative Intent Flag*	*A flag that denotes the grant application that has been approved and has a technical score that falls within the funding organization's budget, but has not yet been funded for the current cycle round.*	*OCITA*
20	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
21	**Research Initiative**	An area of science in which NIH has chosen to fund research. This results in opportunity announcements such as request for applications (RFA), request for proposals (RFP) or program announcements (PAs).	OCITA
22	*Research Initiative ID*	*A unique identifier of a research initiative.*	*OCITA*
23	*Research Initiative Title*	*The name of the research initiative.*	*OCITA*
24	**Research Initiative Funds**	The monies set aside to fund the applications responding to an RFA or RFPs.	OCITA
25	*Research Initiative Funds ID*	*A unique identifier for set aside funds in a research initiative.*	*OCITA*

#	Name	Definition	Source
26	*Available Initiative Funds*	*The available monies to fund applications responding to the RFAs and RFPs.*	*OCITA*
27	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
28	*RoleName*	*A short description specifying the role.*	*OCITA*
29	**Theme**	An overarching categorization of subjects of importance to NIH to enhance the disease- and mission-specific activities. These have been identified as part of the NIH Road Map.	OCITA
30	*Theme ID*	*A unique identifier of a theme.*	*OCITA*

3.4.3 Grants Funds and Management—ORM Model

Figure 8—Grants Funding and Management



3.4.4 Grants Funding and Management—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 12—Grants Funding and Management—Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Research initiative is identified by a research initiative id <ResearchInitiativeID>.	Research initiative is identified by a research initiative id **6253.**			
2	Research initiative with research initiative id <ResearchInitiativeID> has role with role name of <RoleName> played by person with party id <PartyID>.	Research initiative with research initiative id **6253** has role with role name of **Scientific Program Manager** played by person with person id **1267893333.**	M:1		
3	Research initiative with research initiative id <ResearchInitiativeID> has research initiative funds with research initiative funds id <ResearchInitiativeFundsID>.	Research initiative with research initiative id **6253** has research initiative funds with research initiative funds id **34253.**	M:1		
4	Research initiative with research initiative id <ResearchInitiativeID> has administering organization with organization id <PartyID>.	Research initiative with research initiative id **6253** has administering organization with organization id **234188432.**	M:1		
5	Research initiative with research initiative id <ResearchInitiativeID> has primary funding organization with organization id <PartyID>.	Research initiative with research initiative id **6253** has primary funding organization with organization id **234188432.**	M:1		
6	Research initiative funds with research initiative funds id <ResearchInitiativeFundsID> have available initiative funds of <AvailableInitiativeFunds>.	Research initiative funds with research initiative funds id **34253** have available initiative funds of **$250,000.**	M:1		
7	Research initiative funds with research initiative funds id <ResearchInitiativeFundsID> have funding organization with organization id <PartyID>.	A research initiative fund with research initiative funds id 34253 has funding organization with organization id **234188432.**	M:1		
8	Research initiative funds with research initiative funds id <ResearchInitiativeFundsID> occurs in council round <CouncilRound>.	Research initiative funds with research initiative funds id occurs in council round **3.**	M:1		
9	Research initiative funds with research initiative funds id <ResearchInitiativeFundsID> occurs in fiscal year	Research initiative funds with research initiative funds id **34253** occurs in fiscal year	M:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	<FiscalYear>.	**2007.**			
10	Research initiative funds with research initiative funds id <ResearchInitiativeFundsID> is for research initiative with research initiative id <ResearchInitiativeID> in council round <CouncilRound> of fiscal year <FiscalYear> from funding organization with organization id <PartyID>.	Research initiative funds with research initiative funds id **34253** is for research initiative with research initiative id **6253** in council round **3** of fiscal year **2007** from funding organization with organization id **234188432.**	1:1		
11	Research initiative with research initiative id <ResearchInitiativeID> has research initiative title of <ResearchInitiativeTitle>.	Research initiative with research initiative id **6253** has research initiative title of **"Brain…"**	M:1		
12	Research initiative with research initiative id <ResearchInitiativeID> is part of theme with theme id of <ThemeID>.	Research initiative with research initiative id **6253** is part of theme with theme id of **783.**	M:1		
13	Opportunity announcement is identified by an opportunity announcement id <OpportunityAnnouncementID>.	Opportunity announcement is identified by an opportunity announcement id **1244.**			
14	Opportunity announcement with opportunity announcement id <OpportunityAnnouncementID> supports research initiative with research initiative id <ResearchInitiativeID>.	Opportunity announcement with opportunity announcement id **1244** supports research initiative with research initiative id **6253.**	M:1		
15	Opportunity announcement with opportunity announcement id <OpportunityAnnouncementID> has opportunity announcement title of <OpportunityAnnouncementTitle>.	Opportunity announcement with opportunity announcement id **1244** has opportunity announcement title of **"Brain…"**	M:1		
16	Opportunity announcement with opportunity announcement id <OpportunityAnnouncementID> has opportunity announcement funds available of <OpportunityAnnouncementFundsAvailable>.	Opportunity announcement with opportunity announcement id **1244** has opportunity announcement funds available of **$1,800,000.**	M:1		
17	Payplan is identified by a payplan id <PayplanID>.	Payplan is identified by a payplan id **783345.**			
18	Payplan with payplan id <PayplanID> is for opportunity announcement with opportunity announcement id <OpportunityAnnouncementID>.	Payplan with payplan id **783345** is for opportunity announcement with opportunity announcement id **1244.**	M:1		
19	Payplan with payplan id <PayplanID> occurs in council round <CouncilRound>.	Payplan with payplan id **783345** occurs in council round **3.**	M:1		
20	Payplan with payplan id <PayplanID> occurs in fiscal year <FiscalYear>.	Payplan with payplan id **783345** occurs in fiscal year **2007.**	M:1		
21	Payplan with payplan id <PayplanID> has funding organization with organization id <PartyID>.	Payplan with payplan id **783345** has funding organization with organization id **234188432.**	M:1		
22	Payplan with payplan id <PayplanID> is for opportunity announcement with opportunity announcement id <OpportunityAnnouncementID> in council round <CouncilRound> of fiscal year <FiscalYear> from funding	Payplan with payplan id **783345** is for opportunity announcement with opportunity announcement id **1244** in council round **3** of fiscal year **2007** from funding organization	1:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	organization with organization id <PartyID>.	with organization id **234188432.**			
23	Payplan with payplan id <PayplanID> has role with role name of <RoleName> played by person with party id <PartyID>.	Payplan with payplan id **783345** has role with role name of **Grant Final Approval Official** played by person with person id **1268903333.**	M:1		
24	Payplan budget item is identified by a payplan budget item id <PayplanBudgetItemID>.	Payplan budget item is identified by a payplan budget item id **89372111.**			
25	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> is for payplan with payplan id <PayplanID>.	Payplan budget item with a payplan budget item id **89372111** is for payplan with payplan id **783345.**	M:1		
26	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has competing grant application with grant application id <GrantApplicationID>.	Payplan budget item with a payplan budget item id **89372111** has competing grant application with grant application id **0123456789.**	M:1		
27	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> is for payplan with payplan id <PayplanID> with competing grant application with grant application id <GrantApplicationID>.	Payplan budget item with a payplan budget item id **89372111** is for payplan with payplan id **783345** with competing grant application with grant application id **0123456789.**	1:1		
28	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has payplan requested amount of <PayplanRequestedAmount>.	Payplan budget item with a payplan budget item id **783345** has payplan requested amount of **$650,000.**	M:1		
29	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has payplan recommended amount of <PayplanRecommendedAmount>.	Payplan budget item with a payplan budget item id **783345** has payplan recommended amount of **$550,000.**	M:1		
30	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has grant award decision flag of <GrantAwardDecisionFlag>.	Payplan budget item with a payplan budget item id **783345** has grant award decision flag of **Yes.**	M:1		
31	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has payplan actual funded amount of <PayplanActualFundedAmount>.	Payplan budget item with a payplan budget item id **783345** has payplan actual funded amount of **$525,000.**	M:1		
32	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has tentative intent flag of <TentativeIntentFlag>.	Payplan budget item with a payplan budget item id **783345** has tentative intent flag of **Yes.**	M:1		
33	Payplan budget item with a payplan budget item id <PayplanBudgetItemID> has tentative intent amount of <TentativeIntentAmount>.	Payplan budget item with a payplan budget item id **783345** has tentative intent amount of **$525,000.**	M:1		

3.5 GRANT ACTION

3.5.1 Introduction

Once the application has made it through the initial peer review and received a fundable or competitive score, the PI applicant completes the just-in-time information (usually related to human subjects and animal welfare, etc.). Once all administrative tasks are completed, the grants management official and/or program officer contacts the PI applicant to discuss the final funding support.

NIH sends the grantee a Notice of Award that contains details on the amount of funding for current and future years, start and end dates and the terms and conditions of the award, and the contact information for the program officer and/or grants management specialist.

The Grants CDM makes the assumption that all budgetary activities associated with the grant award process have been captured and documented elsewhere; and the pertinent data that is required for this grants CDM is noted in this section. The modeling for the budget business area is to be performed sometime in the future, and will be synchronized with the Grants CDM to ensure the accuracy and consistency.

3.5.2 Grant Action—Data Entities and Attributes

Table 13 shows the data entities that have been defined as part of the Grants CDM as related to the grant award. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this standard.

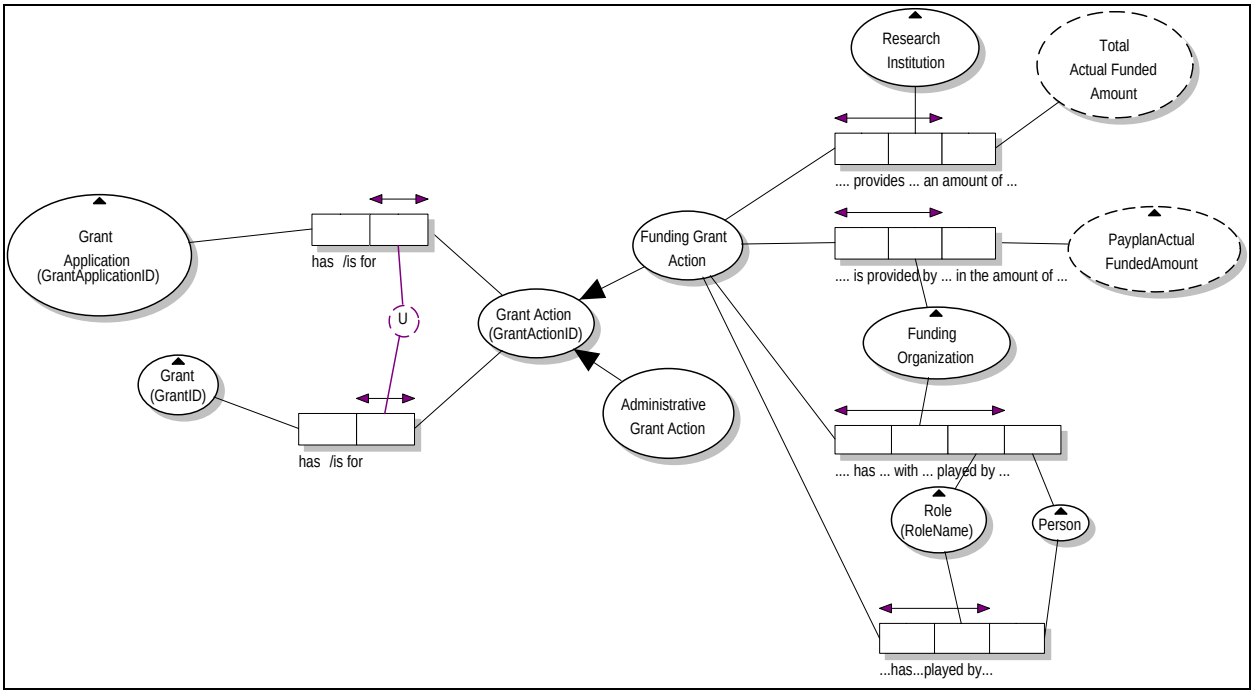
Table 13—Grant Action—CDM Entities and Attributes

#	Name	Definition	Source
1	**Funding Organization**	The organization that is interested in funding the research. Within NIH these are the Institutes and Centers, commonly called "ICs." There are 27 Institutes and Centers that form the National Institutes of Health (NIH), which perform other roles as well in addition to the funding of the grants.	OCITA
2	**Grant**	Financial assistance from Public Health Service agency for approved activities. Performance responsibility rests primarily with a grantee with little or no government involvement in the research; term covers grants and cooperative agreements. A grant starts with the initial funding of a competitive segment. Each competitive segment will have a closeout. The grant will end with the closeout of the final competitive segment.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
3	*Grant ID*	*A unique identifier for a grant.*	*OCITA*
4	**Grant Application**	Application for financial assistance from a Public Health Service agency.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
5	*Grant Application ID*	*An identifier for a grant application that is not derived from other information about the Grant.* *Note: The current Grant Number as implemented in eRA and other NIH systems is derived from other information about the grant. In the future, it is useful to have an ID that does not contain such information. This will result in more flexible systems.* *This is not intended to reflect the current systems identifier.*	*OCITA*
6	**Grant Action**	Approved management decisions that result in changing the core information about the state of a grant in response to an external or internal request. Examples: funding, closeout, changes of PI, changes in institute (IC), no cost extensions, and/or decision not to fund.	OCITA
7	*Grant Action ID*	*A unique identifier for the grant action taken.*	*OCITA*

#	Name	Definition	Source
8	**Funding Grant Action**	The final act to confer funds as part of a grant aligned with a particular budget period for a particular biomedical research project. A change to the current terms and conditions on the Notice of Award can occur and a new Notice of Award is issued.	OCITA
9	*Payplan Actual Funded Amount*	*An amount that is provided to the applicant by each funding organization which is appropriate to the project to be conducted.* *The program manager might provide the funds in the exact amount as requested or s/he may apply discretionary funds in addition to the recommended funds.*	*OCITA*
10	*Total Actual Funded Amount*	*The final awarded amount per individual grant award as noted in the Notice of Award. Usually this value has been negotiated between the PI and the Grants Management Official and/or Scientific Program Manager and includes all amounts received from all the funding organizations.*	*OCITA*
11	**Administrative Grant Action**	The act to oversee the non-financial aspects relevant to a grant in support of the scientific research.	OCITA
12	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
13	**Research Institution**	An organization that conducts biomedical research and may have agreements with the grantee in conducting specific research areas.	OCITA
14	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
15	*RoleName*	*A short description specifying the role.*	*OCITA*

3.5.3 Grant Action—ORM Model

Figure 9—Grant Action



3.5.4 Grant Action—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 14—Grant Action—CDM Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Grant action is identified by a grant action id <GrantActionID>.	Grant action is identified by a grant action id **254231.**	GrantActionID is unique		
2	Grant action with grant action id <GrantActionID> is for grant with grant id <GrantID>.	Grant action with grant action id **254231**is for grant with grant id **67833362.**	M:1		
3	Grant action with grant action id <GrantActionID> is for grant application with grant application id <GrantApplicationID>.	Grant action with grant action id **254231**is for grant application with grant application id **0123456789.**	M:1		
4	Grant action with grant action id <GrantActionID> involves grant application with grant application id <GrantApplicationID> and grant with grant id <GrantID>.	Grant award with grant award id **254231** involves grant application with grant application id **0123456789** and grant with grant id **254231.**	1:1		
5	Funding grant action with grant action id <GrantActionID> provides research institution with organization id <PartyID> a total actual funded amount of <TotalActualFundedAmount>.	Funding grant action with grant action id **254231** provides research institution with organization id **135663908** a total actual funded amount of **$500,000.**	M:1	Usually there is just one funding amount involved in a grant action. The special case is when a requested management change involves a change in research institution, the new institution would have a positive award amount and the old institute may have a negative	

#	Relationship/Rule	Example	Constraint	Assumption	Comment
				amount.	
6	Funding grant action with grant action id <GrantActionID> is provided by funding organization with organization id <PartyID> in the amount of <PayPlanActualFundedAmount>.	Funding grant action with grant action id **254231** is provided by funding organization with organization id **178119908** in the amount of **$100,000.**	M:1		
7	Funding grant action with grant action id <GrantActionID> has funding organization with organization id <PartyID> with role with role name of <RoleName> played by person with person id <PartyID>.	Funding grant action with grant action id **254231** has funding organization with organization id **3336528197** with role with role name of **Grants Management Official** played by person with person id **0123447768.**	M:1		
8	Funding grant action with grant action id <GrantActionID> has the role with role name of <RoleName> played by person with person id <PartyID>.	Grant action with grant action id **254231** has the role with role name of **Lead Grants Management Official** played by person with person id **0123447768.**	M:1	GMO is in funding organization that is lead for the grant.	

3.6 PEER REVIEW

3.6.1 Introduction

After the application is received and given a unique identifier, the NIH Center for Scientific Research (CSR) assigns the application to an Integrated Review Group (IRG) for review and a specific funding organization for funding. Depending on the type of grant, an initial peer review meeting takes place at CSR or a funding organization. Applicants can also request changes to assignments if they are not happy with the CSR-based assignments.

The Scientific Review Group (SRG), also known as study section, is a component of the IRG, organized around a scientific area, which conducts an initial peer review in that field. SRGs can also be made up of special emphasis panels (SEPs) that are formed for an individual meeting. The first level of peer review by non-NIH scientific experts, called peer reviewers, assess the scientific and technical merit of grant applications. Funding organizations review applications with their own specific review requirements. The establishment of the SRGs is part of the Committee Management which is out of scope for this effort.

The scientific review group is composed of scientific experts, and is managed by CSR or IC Scientific Review Officers or Directors (SROs or SRDs). The SROs perform a preliminary check of applications for completion. The first level of peer review by non-NIH scientific experts, called peer reviewers, assess the scientific and technical merit of grant applications. ICs may review applications with additional review requirements. The SRO assigns at least three reviewers—primary, secondary and tertiary reviewers—who are required to read the application thoroughly and write a critique of it before the peer review meeting (this may include identification of the strengths and weaknesses of the application).

Standing scientific review group meetings are held about three times within a year. Special Emphasis Panels meet on an ad hoc basis throughout the year. NIH uses a process called streamlining so that scientific reviewers can focus on applications that are most meritorious in terms of scientific and technical merit. Streamlining requires unanimous consent of the scientific review group members participating in the meeting. Applications that are discussed at the scientific review group meeting receive a priority score and applications that are not discussed do not receive a score. All reviewed applications receive summary statement reports. In addition to the scientific and technical merit, the committee may recommend the number of years to be funded and the amount of money that would be appropriate if not as proposed by the applicant. After the initial peer review, the summary statement report is sent to the identified funding organization for possible funding and to the applicant.

3.6.2 Peer Review—Data Entities and Attributes

Table 15 shows the data entities that have been defined as part of the Grants CDM as related to the Peer Review. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this standard.

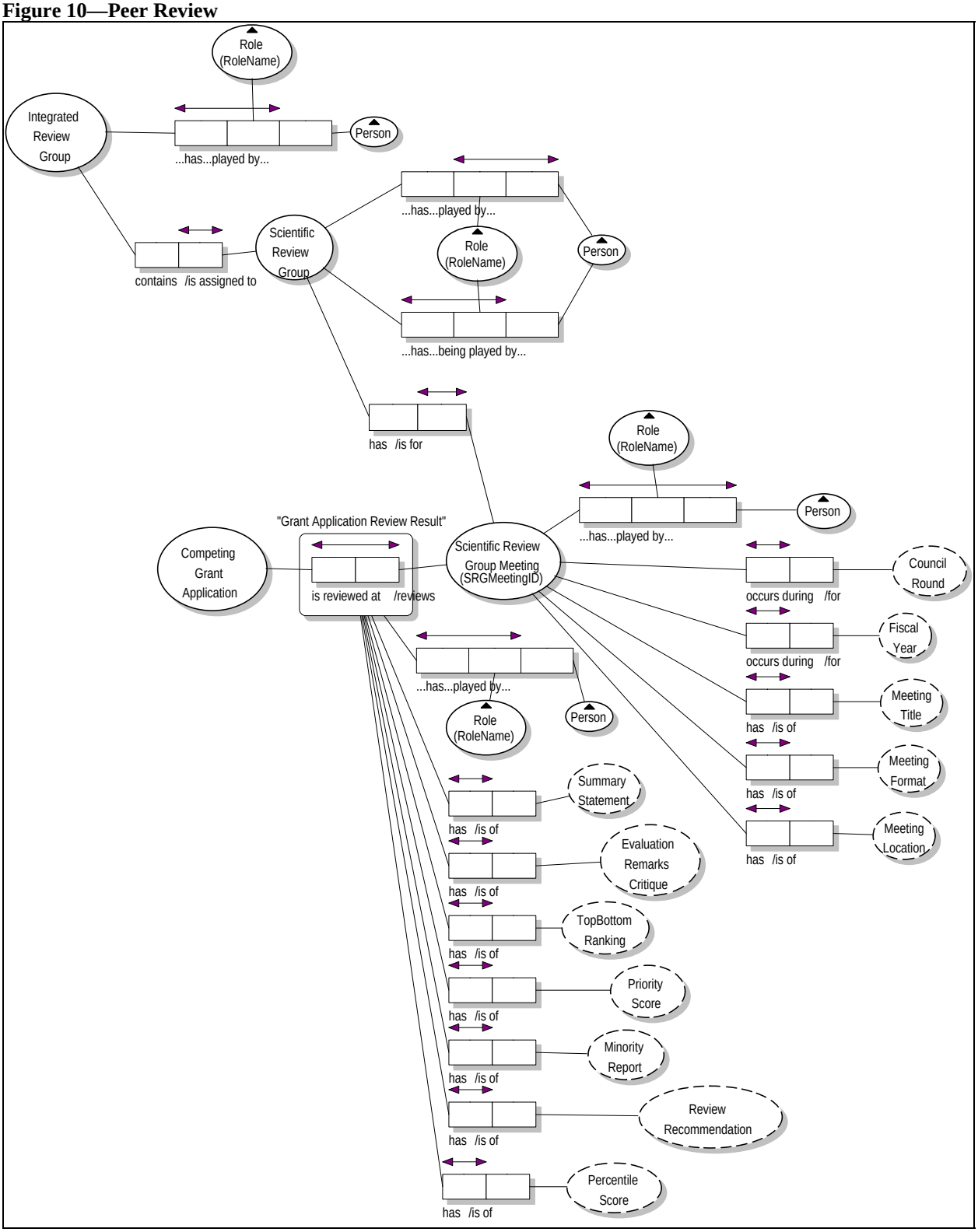
Table 15—Peer Review—CDM Entities and Attributes

#	Name	Definition	Source
1	**Competing Grant Application**	A new grant application that must undergo a peer review.	OCITA
2	**Grant Application Review Result**	A composite/associative entity that allows the tracking and assigning of results (percentile score, summary statements, etc.) of the scientific review meeting to a grant application for each fiscal year in which the application is evaluated.	OCITA
3	*Evaluation Remarks Critique*	*Written evaluations that reviewers prepare before an initial peer review meeting. Critiques are presented to the scientific review group at the meeting and are incorporated into the Summary Statement report by the SRO.* *It recommends a priority score (or deems not recommended for further consideration) and addresses the requested budget, initial peer review criteria, progress made (for a renewal), and responses to the critique from a previous review (for an amended application).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
4	*Percentile Score*	*Ranking used by NIH ICs to set regular grant application paylines and make funding decisions. A percentile shows the relative position of each application's priority score among all scores assigned by a scientific review group at its last three meetings. The range is 0.1 to 100.0; lower numbers represent better scores.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
5	*Priority Score*	*Average of individual ratings of scientific merit given by reviewers of an initial peer review scientific review group. Priority scores range from 100 (outstanding) to 500 (acceptable).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
6	*Summary Statement*	*Official document showing the outcome of initial peer review, including priority score (and percentile for an R01), codes if areas of concern (e.g., human subjects research) and a recommended budget.* *Most summary statements also have a short synopsis prepared by a scientific review officer using peer reviewer critiques.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
7	*Top Bottom Ranking*	*Basis for assessing the scientific merit of NIH research grant applications for initial peer review.* *Value Constraints: Top Ranked; Bottom Ranked.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*
8	**Integrated Review Group**	A group/collection of review study sections organized around a similar area of science that performs initial peer review in	NIAID Glossary of Funding and Policy

#	Name	Definition	Source
	(IRG)	the NIH Center for Scientific Review (CSR).	Terms and Acronyms
9	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
10	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
11	*RoleName*	*A short description specifying the role.*	*OCITA*
12	**Scientific Review Group Meeting**	A composite/associative entity that identifies a scientific review group meeting where a group of scientists review grant applications. The meetings are conducted by NIH Staff, SROs who are usually doctoral-level scientists who have previously conducted research in the scientific disciplines of their scientific review group, and 10 to 20 extramural scientists who are able to evaluate the grant applications assigned to their scientific review group.	OCITA and OER http://grants1.nih.gov/training/q&a.htm
13	*Council Round*	*At NIH, there are at least three, sometimes four, council rounds each fiscal year: October, January, May and sometimes August.* *Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For non-competing applications (types 3 and 5) there is the "00" council, which represents a fifth cycle.*	*OCITA*
14	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on* *October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*
15	*Meeting Format*	*The format of the meeting is captured and tracked. For example, in person, video or teleconference, etc.*	*OCITA*
16	*Meeting Location*	*The site where the meeting is held. For example, this may be a city, state, building, room, etc.*	*OCITA*
17	*Meeting Title*	*A label or heading given to a meeting to designate its purpose.*	*OCITA*
18	**Scientific Review Group (SRG)**	Component of an NIH Center for Scientific Review and ICs integrated review group organized around a scientific area, which conducts initial peer review in that field. Composed of non-NIH scientific experts, study sections are managed by CSR or IC specific scientific review officers or directors. SRGs can be Chartered SRGs (or study sections) with a core of standing members, recurring Special Emphasis Panels (SEPs) or non-recurring Special Emphasis Panels.	NIAID Glossary of Funding and Policy Terms and Acronyms

3.6.3 Peer Review—ORM Model

Figure 10—Peer Review



3.6.4 Peer Review—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 16—Peer Review—CDM Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Integrated review group with organization id <PartyID> has role with role name of <RoleName> played by person with party id <PartyID>.	Integrated review group with organization id **077756789** has role with role name of **Chief** played by person with person id **125423333.**	M:1		
2	Integrated review group with organization id <PartyID> contains a scientific review group with organization id <PartyID>.	Integrated review group with organization id **077756789** contains a scientific review group with organization id **044446789.**	1:M		
3	Scientific review group with organization id <PartyID> has role with role name of <RoleName> played by person with party id <PartyID>.	Scientific review group with organization id **044446789** has role with role name of **Member** played by person with person id **125423333.**	1:M		
4	Scientific review group with organization id <PartyID> has role with role name of <RoleName> played by person with party id <PartyID>.	Scientific review group with organization id **044446789** has role with role name of **Chairman** played by person with person id **125423333.**	M:1		
5	Scientific review group meeting with SRG meeting id <SRGMeetingID> is for scientific review group with organization id <PartyID>.	Scientific review group meeting with SRG meeting id **33524** is for scientific review group with organization id **234188432.**	M:1		
6	Scientific review group meeting with meeting with SRG meeting id <SRGMeetingID> has role with role name of <RoleName> played by person with party id <PartyID>.	Scientific review group meeting with SRG meeting id **33524** has role with role name of **Attendee** played by person with person id **155423333.**	M:M		
7	Scientific review group meeting with	Scientific review group meeting with SRG meeting id	M:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	SRG meeting id <SRGMeetingID> occurs during council round <CouncilRound>.	**33524** occurs during council round **2.**			
8	Scientific review group meeting with SRG meeting id <SRGMeetingID> occurs during fiscal year <FiscalYear>.	Scientific review group meeting with SRG meeting id **33524** occurs during fiscal year **2007.**	M:1		
9	Scientific review group meeting with SRG meeting id <SRGMeetingID> has meeting title of <MeetingTitle>.	Scientific review group meeting with SRG meeting id **33524** has meeting title of **Biomedical….**	M:1		
10	Scientific review group meeting with SRG meeting id <SRGMeetingID> has meeting format of <MeetingFormat>.	Scientific review group meeting with SRG meeting id **33524** has meeting format of **teleconferencing.**	M:1		
11	Grant application review result is identified by a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID>.	Grant application review result is identified by a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting with SRG meeting id **33524.**	M:M	The grant application must be assigned to the scientific review group.	
12	Grant application review result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has role with role name of <RoleName> played by person with party id <PartyID>.	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for scientific review group with SRG meeting id **33524** has role with role name of **Primary Reviewer** played by person with person id **125423333.**	M:1		
13	Grant application review result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has summary statement of <ProjectSummary>.	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for scientific review group with SRG meeting id **33524** has project summary of **"Every…"**	M:1		
14	Grant application review result with a competing grant application with grant application id <GrantApplicationID>	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for	M:1		This can be written by primary or

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has evaluation remarks critique of <EvaluationRemarksCritique>.	scientific review group with SRG meeting id **33524** has evaluation remarks critique of **"This…"**			secondary reviewers, but only one person writes the review.
15	Grant application review result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has a top/bottom ranking in the <TopBottomRanking> half.	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for scientific review group with SRG meeting id **33524** has a top/bottom ranking in the **top** half.	M:1; Value: top or bottom		
16	Grant application review result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has the priority score of <PriorityScore>.	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for scientific review group with SRG meeting id **33524** has the priority score of **254.**	M:1; Value: Score from 100-500. The average of individual scores (1—5) multiplied by 100.		
17	Grant application review result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the scientific review group meeting for scientific review group with SRG meeting id <SRGMeetingID> has a percentile score of <PercentileScore>.	Grant application review result with a competing grant application with grant application id **0123456789** being reviewed at the scientific review group meeting for scientific review group with SRG meeting id **33524** has a percentile score of **78.8.**	M:1	The percentile sore (0.0 to 99.9) normalizes the score output of the scientific review groups. The percentile score is assigned mathematically and is a way of ranking the applications that are reviewed in different scientific review groups	The range is.1 to 100.0; lower numbers represent better scores.

3.7 ADVISORY COUNCIL

3.7.1 Introduction

The second-level review is generally conducted by a funding organization's advisory council or board that results in funding recommendations to the funding organization's directors. The council review ensures that there are no administrative problems, in addition to the prior administrative reviews performed by the Scientific Review Officer (SRO) and/or Extramural Support Assistant (ESA) in the applications and does not conduct scientific reviews again. The Advisory Council reviews the applications with potential barriers to funding, such as human subject and animal concerns, etc., and provides recommendations for resolution. The Advisory Council recommends the application for funding.
The Advisory Council may also recommend grant applications conducting research on programmatically important topics (program priority) for expedited payments.

NIH provides a process which enables an applicant to dispute the results of the initial peer review results based on errors in the review process such as factual errors, reviewer bias and reviewer conflict of interest, but not a difference of scientific opinion. Program officers and/or scientific review officers usually resolve issues with applicants before reaching the formal appeal stage.

If the program officers, SROs and PI cannot reach a resolution, the Advisory Council Board of the IC will consider the appeal. The Advisory Council Board typically recommended the applicants to re-submit their applications, which are re-reviewed by the same SRG or a different SRG.

3.7.2 Advisory Council—Data Entities and Attributes

Table 17 shows the data entities that have been defined as part of the Grants CDM as related to the Advisory Council. These entities represent the core business data that needs to be collected and managed throughout the NIH. For each of the entities, the following information is provided:

- *Entity Name:* The name used to refer to the entity. (**Bolded** within this standard.
- *Attribute Name:* The name used to refer to an attribute. (*Italicized* within this standard.
- *Definition:* A description of the entity in plain English, consistent with the understood common usage within NIH.
- *Source:* The point of origin for the definitions identified within this standard.

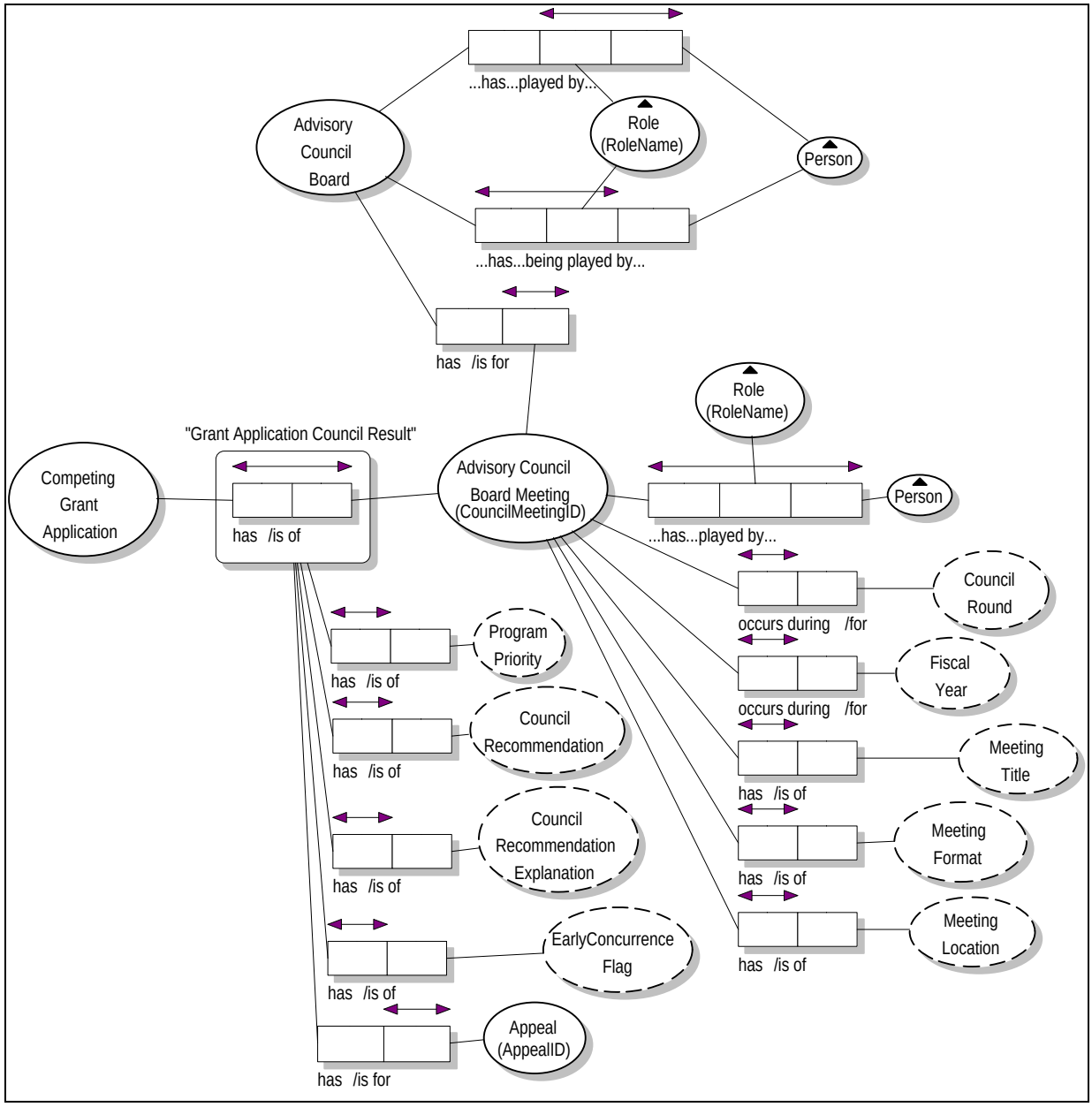
Table 17—Advisory Council—CDM Entities and Attributes

#	Name	Definition	Source
1	**Advisory Council/Board**	Chartered NIH institute advisory committee that performs second-level peer review, makes funding and policy recommendations, and helps develop research agendas. In addition to grants advisory action, additional boards may exist, such as the Advisory Council to the Director (ACD), which is made up of external experts who are to assist the NIH Office of Director in making of major plans and policies, especially those related to allocation of NIH funds and resources (for example, pioneer awards). Advisory Board is interchangeably used with Advisory Council.	NIAID Glossary of Funding and Policy Terms and Acronyms
2	**Advisory Council Board Meeting**	A meeting held to perform second-level review, make funding and policy recommendations and help develop and provide concept clearance for research agenda.	OCITA
3	*Council Meeting ID*	*A unique identifier for each council meeting held within a council round.*	*OCITA*
4	*Council Round*	*At NIH, there are at least three, sometimes four, council rounds each fiscal year: October, January, May and sometimes August. Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For non-competing applications (types 3 and 5) there is the "00" council which represents a fifth cycle.*	*OCITA*
5	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*
6	*Meeting Format*	*The format of the meeting is captured and tracked. For example, in person, video or teleconference, etc.*	*OCITA*
7	*Meeting*	*The site where the meeting is held. For*	*OCITA*

#	Name	Definition	Source
	Location	*example, this may be a city, state, building, room, etc.*	
8	*Meeting Title*	*A label or heading given to a meeting to designate its purpose.*	*OCITA*
9	**Appeal**	A procedure for contesting an initial peer review of a grant application.	OCITA
10	*Appeal ID*	*A unique identifier to represent the start of an appeal process by the applicant.*	*OCITA*
11	**Competing Grant Application**	A new grant application that must undergo a peer review.	OCITA
12	**Grant Application Council Result**	A composite/associative entity that allows a council meeting to assign properties to a grant application.	OCITA
13	*Council Recommendation*	*Council decisions that relate to peer review (scientific merit) recommendations on whether or not to fund. Councils can also recommend approaches to resolve the barriers to funding before the application can be funded.* *Value Constraints: concur, non-concur, defer.* *Note: "Defer" sends the grant applications to the next council review.*	*OCITA*
14	*Council Recommendation Explanation*	*Explanations provided by the Council to resolve the barriers to funding.*	*OCITA*
15	*Early Concurrence Flag*	*Agreement by the advisory council with the initial peer review group recommendations for funding approval.*	OCITA
16	*Program Priority*	*Applications are assigned a program priority to pay for some grants that fall below the automatic payline that have high program relevance.* *Value Constraints: HPP (High Program Priority); LPP (Low Program Priority).*	*OCITA*
17	**Person**	Any individual of interest to the NIH for whom the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
18	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012
19	*RoleName*	*A short description specifying the role.*	*OCITA*

3.7.3 Advisory Council Meeting—ORM Model

Figure 11—Advisory Council Meeting



3.7.4 Advisory Council Meeting—Relationships and Rules

In addition to the key entities defined as part of the Grants CDM, there are relationships between entities that can be expressed as statements of business rules. For each of the relationships, a statement of the relationship and an example are provided. In the case of "is a type of" or subtype relationships, examples are not applicable. Subtype rules allow for the restricting of populations within relation entities. They are enforceable rules on the metamodel level and examples do not provide further clarification of the rule. Some examples have placeholder variables to denote that there are no real world examples at NIH for these high-level objects. In each case, the corresponding lower-level objects are individually identified.

Table 18—Advisory Council Meeting—CDM Relationships and Rules

#	Relationship/Rule	Example	Constraint	Assumption	Comment
1	Advisory council board with organization id <PartyID> has role with role name of <RoleName> played by person with party id <PartyID>.	Advisory council board with organization id **233388432** has role with role name of **Member** played by person with person id **1266623333.**	1:M		
2	Advisory council board with organization id <PartyID> has role with role name of <RoleName> played by person with party id <PartyID>.	Advisory council board with organization id **233388432** has role with role name of **Council Executive Secretary** played by person with person id **1266623333.**	M:1		
3	Advisory council board meeting with council meeting id <CouncilMeetingID> is for advisory council board with organization id <PartyID>.	Advisory council board meeting with council meeting id **36624** is for advisory council board with organization id **233388432.**	M:1		
4	Advisory council board meeting with meeting with council meeting id <CouncilMeetingID> has role with role name of <RoleName> played by person with party id <PartyID>.	Advisory council board with council meeting id **36624** has role with role name of **Attendee** played by person with person id **155443333.**	M:M		
5	Advisory council board meeting with council meeting id <CouncilMeetingID> occurs during council round <CouncilRound>.	Advisory council board meeting with council meeting id **36624** occurs during council round **2.**	M:1		
6	Advisory council board meeting with council meeting id <CouncilMeetingID> occurs during fiscal year <FiscalYear>.	Advisory council board meeting with council meeting id **36624** occurs during fiscal year **2007.**	M:1		
7	Advisory council board meeting with council meeting id <CouncilMeetingID> has meeting title of <MeetingTitle>.	Advisory council board meeting with council meeting id **33524** has meeting title of **Biomedical…**	M:1		
8	Advisory council board meeting with council meeting id <CouncilMeetingID> has meeting	Advisory council board meeting with council meeting id **36624** has meeting format of **e-**	M:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	format of <MeetingFormat>.	**mail.**			
9	Grant application council result is identified by a competing grant application with grant application id <GrantApplicationID> being reviewed at the advisory council board meeting for scientific review group with council meeting id <CouncilMeetingID>.	Grant application council result is identified by a competing grant application with grant application id **0123456789** being reviewed at the advisory council board meeting with council meeting id **36624.**	M:M	The grant application must be assigned to the advisory council board.	
10	Grant application council result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the advisory council board meeting for advisory council board with council meeting id <CouncilMeetingID> receives a <ProgramPriority> priority.	Grant application council result with a competing grant application with grant application id **0123456789** being reviewed at the advisory council board meeting for advisory council board with council meeting id **36624** receives an **HPP** priority.	M:1		
11	Grant application council result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the advisory council board meeting for advisory council board with council meeting id <CouncilMeetingID> receives a council recommendation of <CouncilRecommendation>.	Grant application council result with a competing grant application with grant application id **0123456789** being reviewed at the advisory council board meeting for advisory council board with council meeting id **36624** receives a council recommendation of **Concur.**	M:1		
12	Grant application council result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the advisory council board meeting for advisory council board with council meeting id <CouncilMeetingID> receives a council recommendation explanation of <CouncilRecommendationExplanation>.	Grant application council result with a competing grant application with grant application id **0123456789** being reviewed at the advisory council board meeting for advisory council board with council meeting id **36624** receives a council recommendation explanation of **"This is…"**.	M:1; An explanation is only provided for a council recommendation of "non-concur."		
13	Grant application council result with a competing grant application with grant application id <GrantApplicationID> being reviewed at the advisory council board meeting for advisory council board with council meeting id <CouncilMeetingID> has an early concurrence flag of <EarlyConcurrenceFlag>.	Grant application council result with a competing grant application with grant application id **0123456789** being reviewed at the advisory council board meeting for advisory council board with council meeting id **36624** has an early concurrence flag of **Yes.**	M:1		
14	Grant application council result with a competing grant application with grant	Grant application council result with a competing grant application with grant	M:1		

#	Relationship/Rule	Example	Constraint	Assumption	Comment
	application id <GrantApplicationID> being reviewed at the advisory council board meeting for advisory council board with council meeting id <CouncilMeetingID> has an appeal with an appeal id of <AppealID>.	application id **0123456789** being reviewed at the advisory council board meeting for advisory council board with council meeting id **36624** has an appeal with an appeal id of **11176.**			

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5 Contact

To contact the NIHRFC Editor, send an e-mail message to EnterpriseArchitecture@mail.nih.gov.

6 Security Considerations

This NIHRFC raises no security issues.

7 Changes

Version	Date	Change	Authority	Author of Change
0.1	05/31/2007	Original Draft	NIHRFC0001	Demetrios Kotsikopoulos/Taruna Reddy/John Sharp
0.2	6/13/2007	Assigned NIHRFC number	NIHRFC0001	Steve Thornton, NIHRFC Editor
0.3	7/05/2007	Modified introduction and business context	Helen Schmitz, Acting Chief IT Architect	Steve Thornton, NIHRFC Editor
0.4	12/07/07	Incorporated comments and editorial changes Please see Appendix G – Document Revision History for additional document change details	Helen Schmitz, Acting Chief IT Architect	Demetrios Kotsikopoulos/Taruna Reddy/John Sharp
0.5	03/18/08	Incorporated additional comments and advice to refine the Grants CDM	Helen Schmitz, Acting Chief IT Architect	Demetrios Kotsikopoulos/Taruna Reddy/John Sharp
1.0	04/14/08	Approved by ARB on 4/2/2008	ARB	Steve Thornton, NIHRFC Editor

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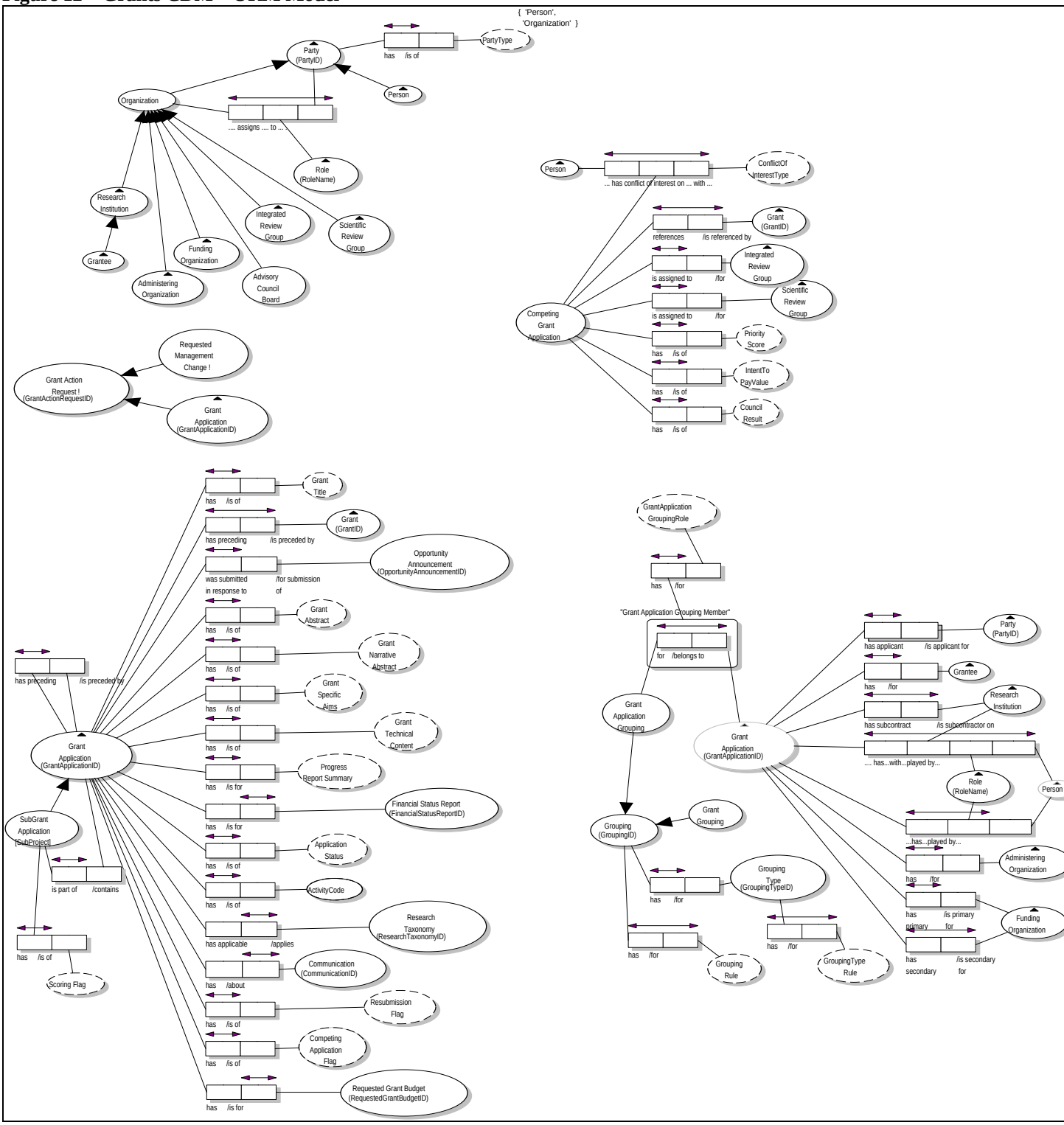
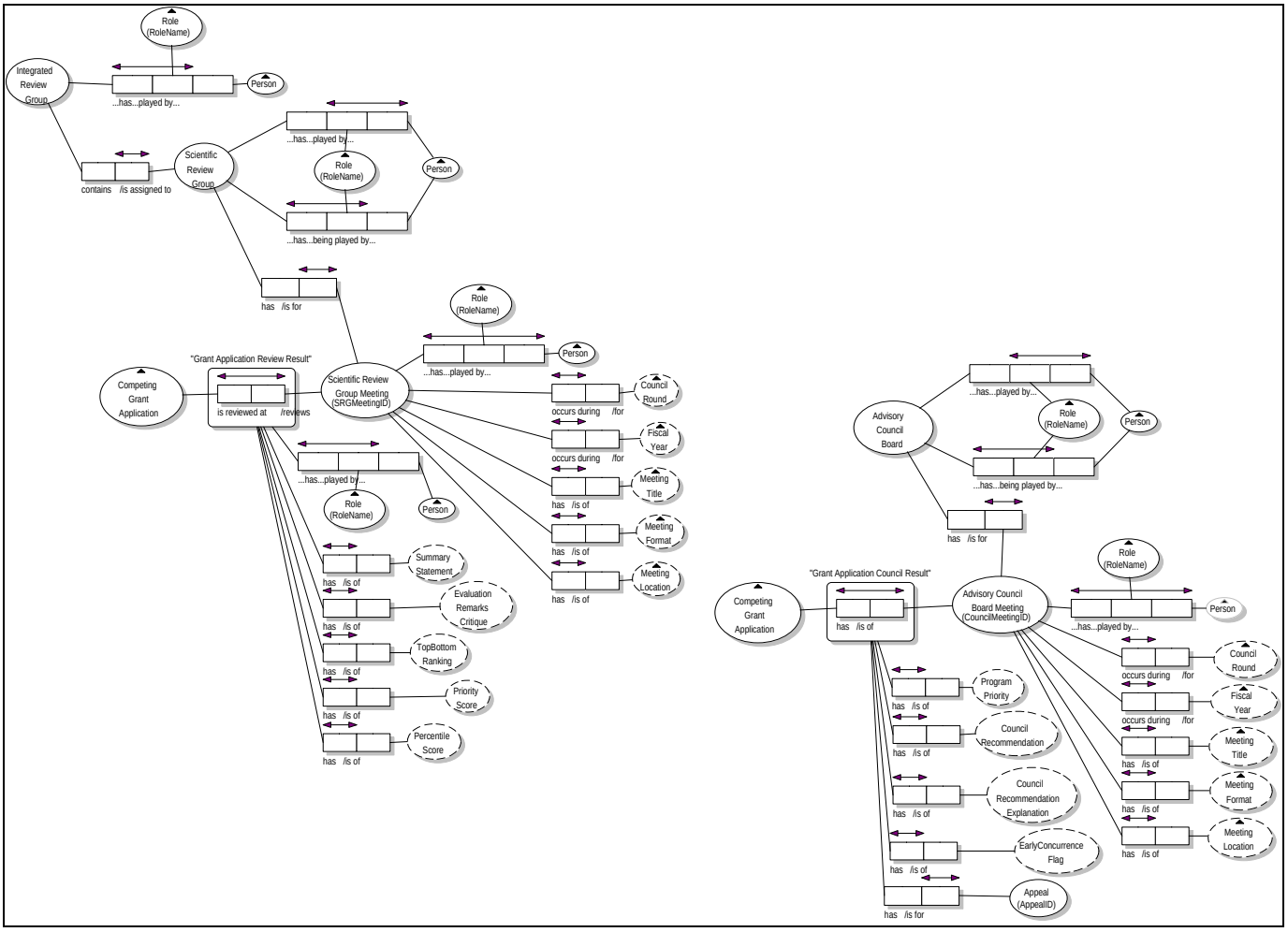
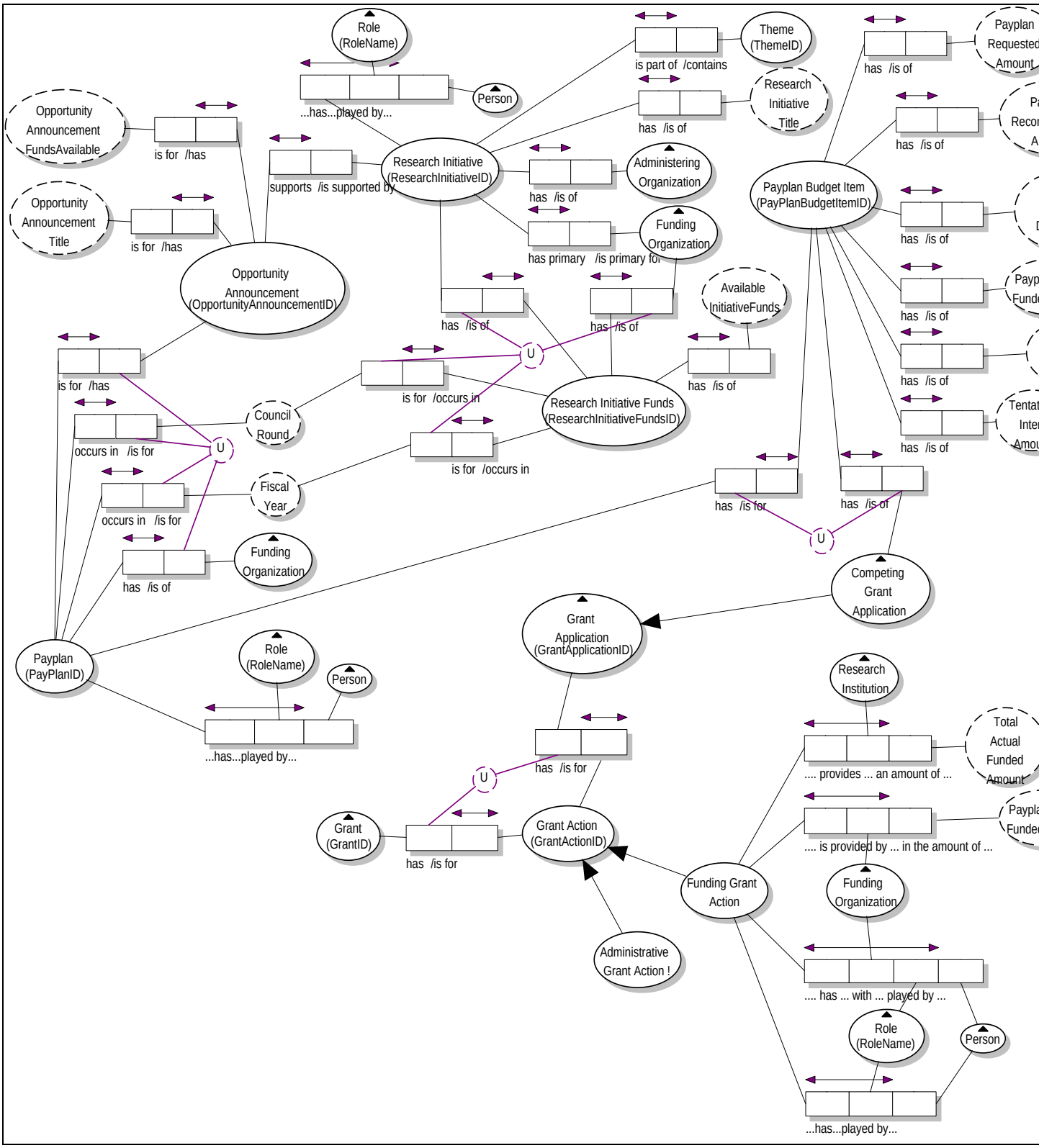
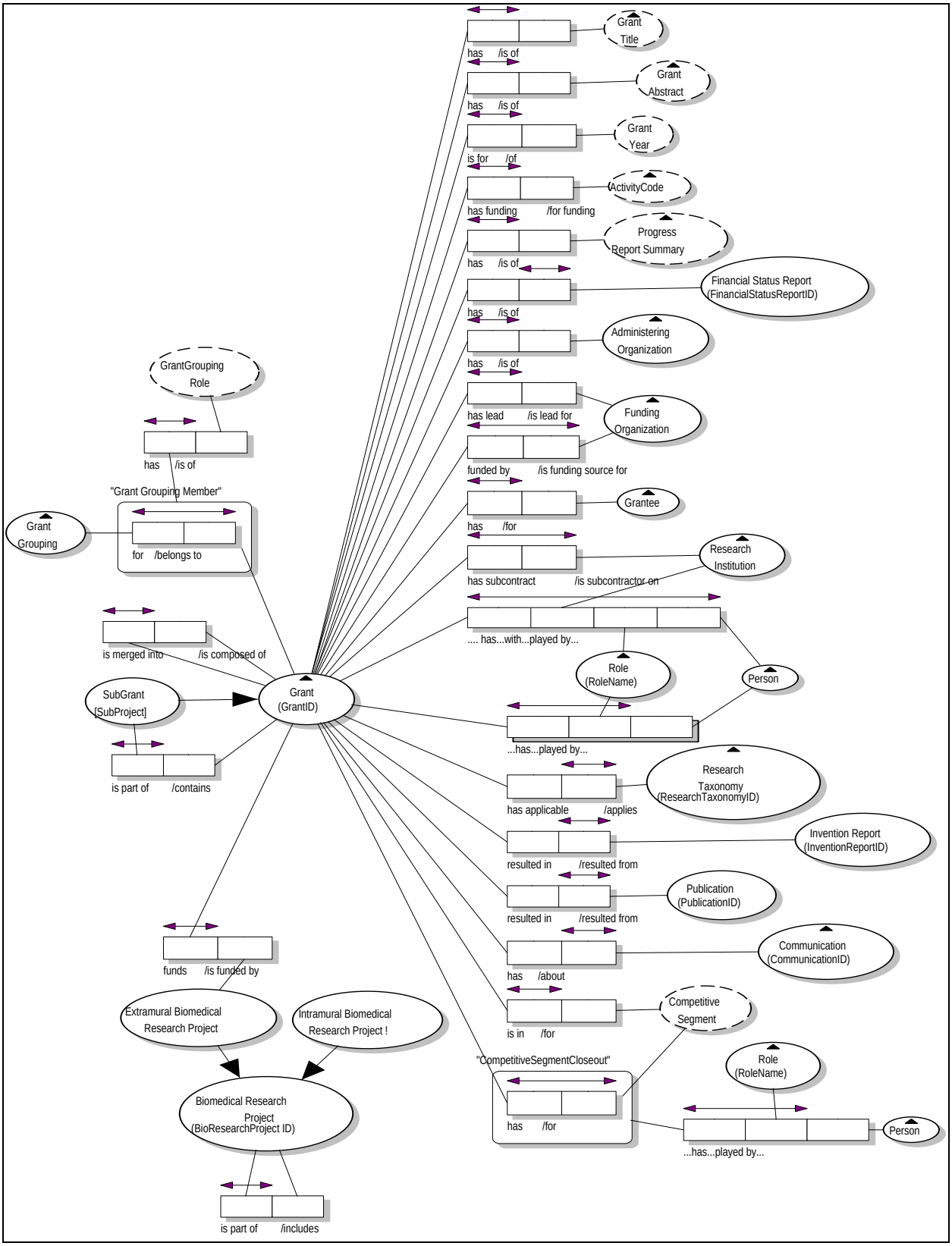
Appendix A: Comprehensive Grants CDM—ORM Notation

Figure 12—Grants CDM—ORM Model

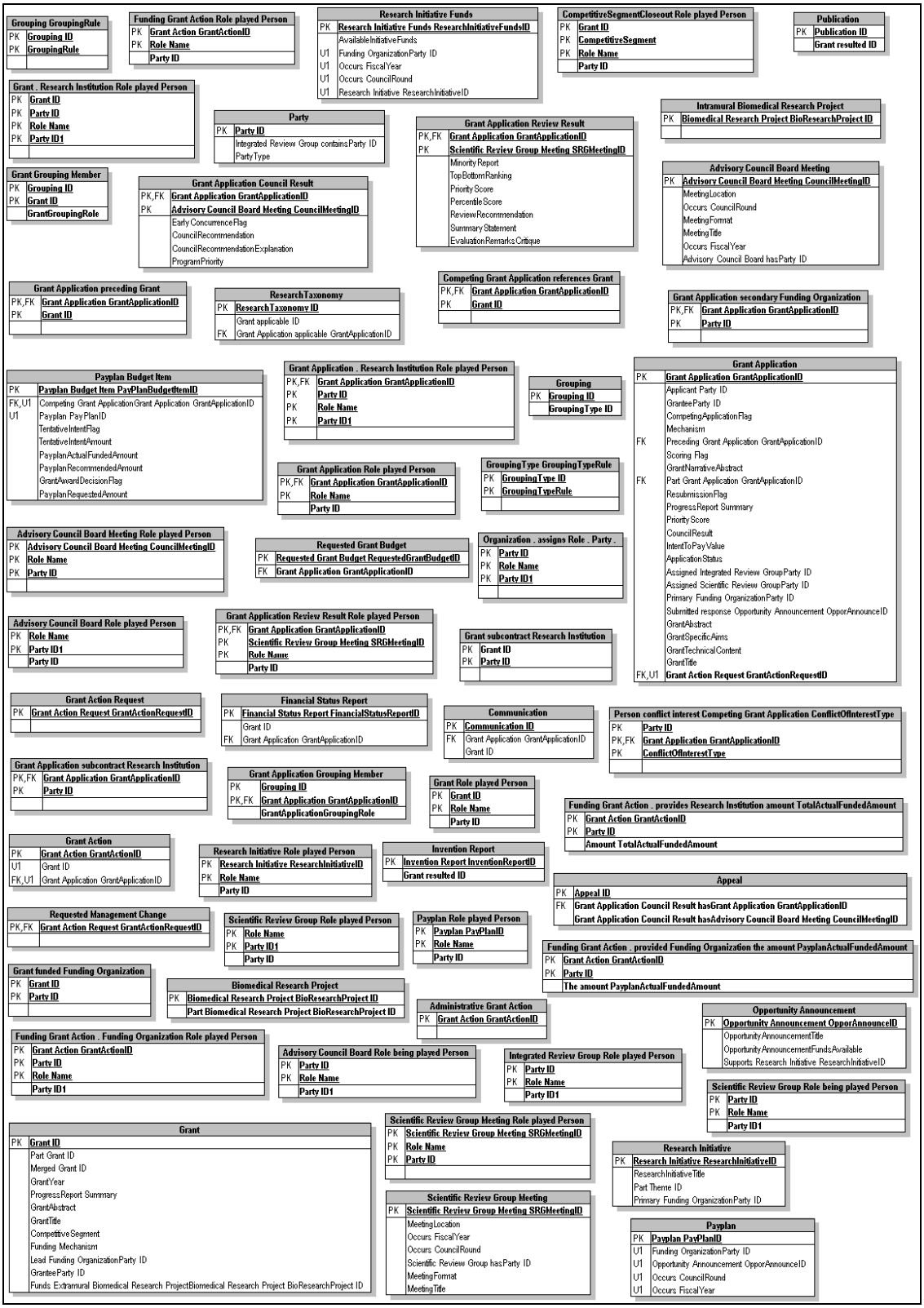



Role (RoleName)
Integrated Review Group
Person
...has...played by...
Scientific Review Group
contains /is assigned to
...has...being played by...
has /is for
"Grant Application Review Result"
Competing Grant Application
is reviewed at /reviews
Scientific Review Group Meeting (SRGMeetingID)
occurs during /for
Council Round
Fiscal Year
Meeting Title
Meeting Format
Meeting Location
Summary Statement
Evaluation Remarks Critique
TopBottom Ranking
Priority Score
Percentile Score
Advisory Council Board
"Grant Application Council Result"
Advisory Council Board Meeting (CouncilMeetingID)
Program Priority
Council Recommendation
Council Recommendation Explanation
EarlyConcurrence Flag
Appeal (AppealID)


Role (RoleName)
...has...played by...
Person
Theme (ThemeID)
is part of /contains
has /is of
Research Initiative Title
Payplan Requested Amount
Opportunity Announcement FundsAvailable
is for /has
supports /is supported by
Research Initiative (ResearchInitiativeID)
Administering Organization
Payplan Budget Item (PayPlanBudgetItemID)
Opportunity Announcement Title
Funding Organization
has primary /is primary for
Opportunity Announcement (OpportunityAnnouncementID)
Available InitiativeFunds
U
is for /has
is for /occurs in
Research Initiative Funds (ResearchInitiativeFundsID)
Council Round
occurs in /is for
Fiscal Year
Competing Grant Application
Payplan (PayPlanID)
Grant Application (GrantApplicationID)
Research Institution
Total Actual Funded Amount
.... provides ... an amount of ...
Grant (GrantID)
Grant Action (GrantActionID)
.... is provided by ... in the amount of ...
Funding Grant Action
Administrative Grant Action !
.... has ... with ... played by ...


Grant Title
has /is of
Grant Abstract
has /is of
Grant Year
is for /of
ActivityCode
has funding /for funding
Progress Report Summary
has /is of
Financial Status Report (FinancialStatusReportID)
has /is of
Administering Organization
has /is of
Funding Organization
has lead /is lead for
funded by /is funding source for
Grantee
has /for
Research Institution
has subcontract /is subcontractor on
.... has...with...played by...
Role (RoleName)
Person
...has...played by...
Research Taxonomy (ResearchTaxonomyID)
has applicable /applies
Invention Report (InventionReportID)
resulted in /resulted from
Publication (PublicationID)
resulted in /resulted from
Communication (CommunicationID)
has /about
Competitive Segment
is in /for
"CompetitiveSegmentCloseout"
has /for
Role (RoleName)
Person
...has...played by...
GrantGrouping Role
has /is of
"Grant Grouping Member"
Grant Grouping
for /belongs to
is merged into /is composed of
SubGrant [SubProject]
is part of /contains
Grant (GrantID)
funds /is funded by
Extramural Biomedical Research Project
Intramural Biomedical Research Project !
Biomedical Research Project (BioResearchProject ID)
is part of /includes

Appendix B: Comprehensive Grants CDM – ERD Notation



Appendix C: Data Modeling Tutorial

What is data modeling and why is it used?

Data modeling is the process of exploring and representing data in a structured manner within a knowledge or subject area. Data models identify the data elements that the business uses and how they relate to one another. This is represented by entities (or kinds of things of significance) about which an organization wishes to know, collect and maintain information, the attributes (characteristics of the information) of that information, and the relationships among the entities. In addition to defining and organizing the data, data modeling imposes constraints or limitations (implicitly or explicitly) on how that data is placed within a structure.
Data models typically address only structured data and do no describe any unstructured data such as e-mail messages, graphics, pictures, etc.
Data models can be one or more of three kinds: conceptual, logical and physical data models:

- A *conceptual data model*, sometimes called domain models, typically are used to explore the domain concepts at a high level with stakeholders with the entities, attributes and the relationships among them.
- A *logical data model* describes the tables and columns.
- A *physical data model* describes the physical and internal mechanisms within database depicting the data columns of the tables and the relationships between the tables.

The conceptual data model is typically devoid of detailed implementation information such as database vendor, how the physical database will be built (i.e., relational, objected oriented or other dimensional information), etc. The entities and relationships can be depicted pictorially to allow stakeholders and users to easily view the information structure as shown in Figure 13. Data instances represent the real world occurrence of data as seen in Figure 13. This is one of the mechanisms to test the validity of the concepts and relationships within the data model.

Figure 13: Entity and Relationships

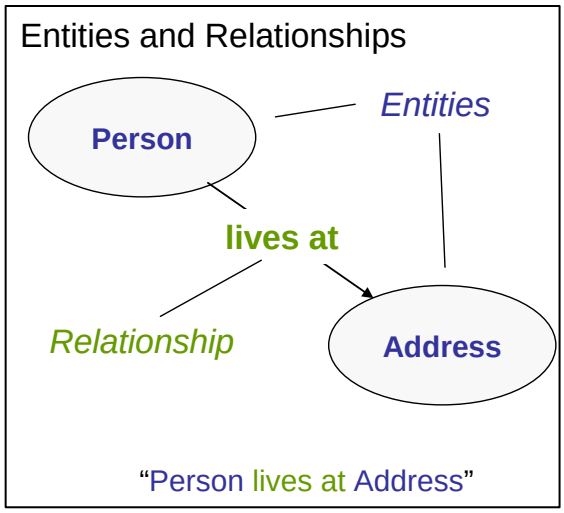
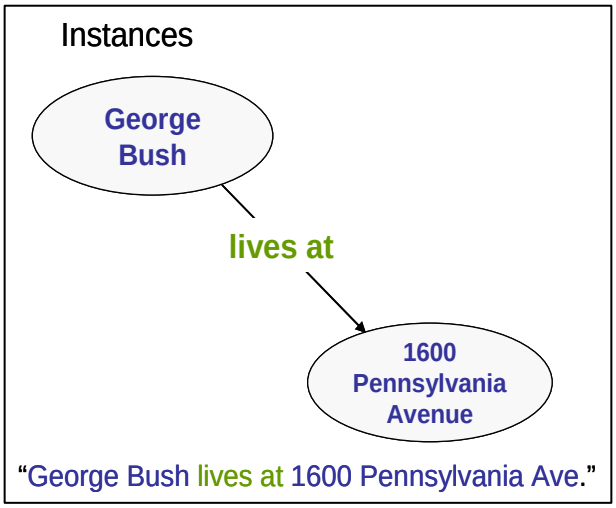
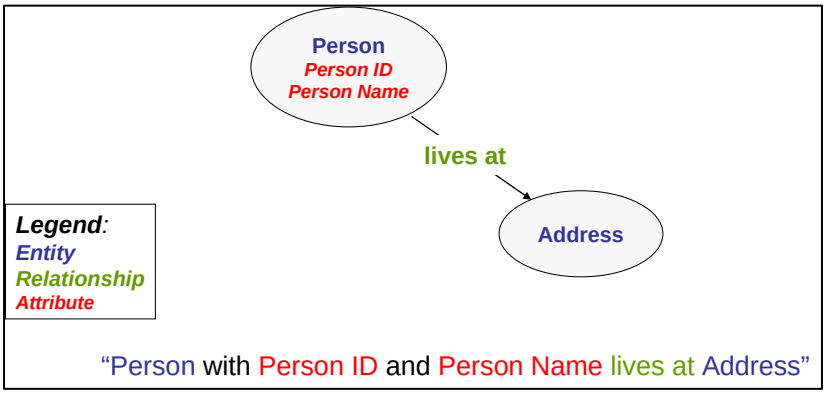


Figure 14: Instances of Data



In addition to the entities and relationships within the model, we also define characteristics of the entities known as attributes as shown in Figure 15:

Figure 15: Entity, Relationships and Attributes



From the conceptual data model, further decomposition of the model provides the detailed information (logical and physical information) and structures as to how the model will be physically built, along with the systems that will use the models.

Models provide a formal, rigorous way of representing the world by providing an unambiguous input to the design and development of IT solutions, and another mechanism to communicate about data. Good and consistent models allow reliable data to be shared across systems and also help facilitate the evolution of systems changes.

Categories of Data Models

Table 19 shows the definitions and purpose of different types of data models that may be created as part of NIH's Enterprise Data Architecture or in support of specific solution implementations.

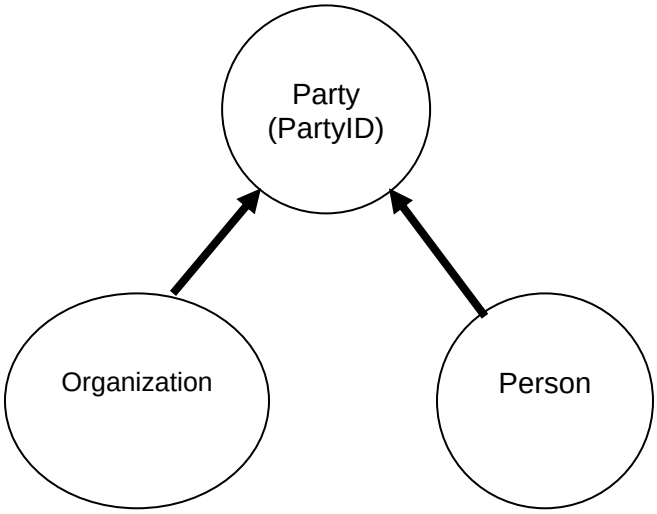
Table 19—Categories of Data Models

	Description	Purpose
Conceptual Data Model	A CDM represents the overall logical structure of a database, which is independent of any software or data storage structure. A conceptual model often contains data objects not yet implemented in the physical databases. It gives a formal representation of the data needed to run an enterprise or a business activity.	Suitable as an enterprise level artifact to provide an overall set of key data entities to facilitate management of enterprise data resources and support effective information sharing.
Logical Data Model	A logical view of the conceptual data model. Data Architecture theories such as "normalization" are applied to transform the conceptual data model into the logical data model that moves the data modeling further towards the ultimate prescription for the data architecture to be implemented. Relationships get absorbed as "attributes" known as foreign keys or pointers within appropriate logical model entities. This may be explicit or implied in the logical data model. As long as the resulting physical data model includes the necessary foreign key columns and joins, the inclusion of foreign-keys in the logical data model is a matter of convenience. Logical Data Model does not have any specific restrictions and/or requirements imposed by the Database Management System (DBMS) to be used for creating the actual database.	Suitable for representing the detailed business rules governing the structure of data elements and their relationships. Provides a more detailed view of the data and is more suitable for specific systems designs of for the description of enterprise data standards.
Physical Data Model	The mapping of conceptual or logical database design data groupings into physical database areas, files, records, elements, fields , and keys while adhering to the physical constraints of the hardware, DBMS software, and communications network to provide physical data integrity while meeting the performance and security constraints of the services to be performed against the database.	Suitable for the design of specific implementations of a data model. Generally not suitable for enterprise standards or architecture specification

Subtypes and Supertypes of Objects

The Grants CDM model has special notations for describing Subtypes and Supertypes. A supertype is a high level object that has widespread use across the model. In this model, subtypes are smaller sets of the supertype that share common attributes and they allow for the specification of more precise rules.

Figure 16—Party Supertype with Organization and Person Subtypes



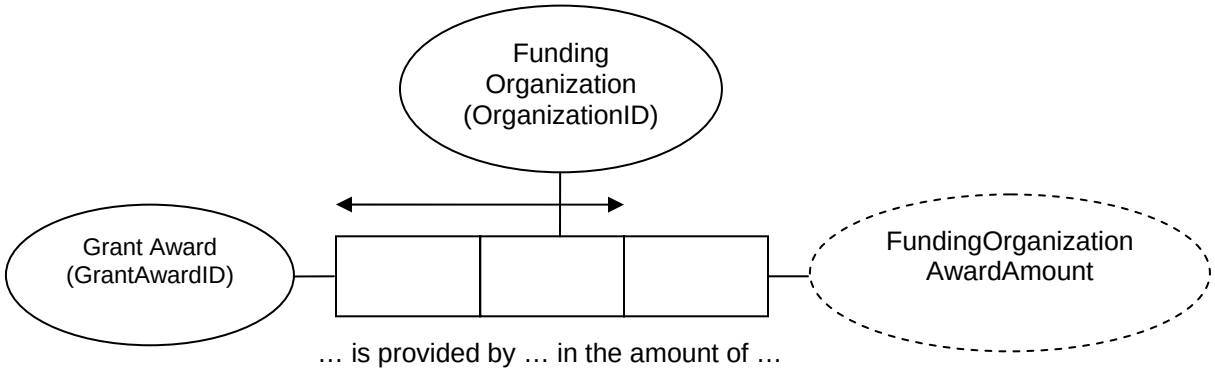
In the example above, Party (the supertype) can be used to designate rules where either an instance of a Person or Organization (the subtypes) can be valid. An example in this model is where an applicant for a grant is either a person requesting a grant for a fellowship or an organization requesting a grant for medical research. Other rules only apply to groups of Organizations and the rules are written so that Subject Matter Experts can understand and validate the rule. An example of this is a Research Institution (subtype of Organization), which can be designated as a contractor on a grant application. This model has chosen to allow for continual expansion of the known group of Roles for Person by making the Role object a variable. For the purpose of this model, all sets of people (subsets of Person) have been defined using the Role object.

ORM Diagrams and Natural Language Modeling

Object Role Modeling (ORM) is a graphical modeling technique that precisely displays fact types and business rules. Natural Language Modeling (NLM)[7] is completely sentence-based and provides subject matter experts with the ability to establish and validate fact types and business rules without becoming proficient in reading graphical models. Both of these focus on the establishment of fact types and rules that are sentence-based.

Figure 17—ORM Fact Type

[7] For more information on the NLM notation and interpreting NLM models see http://www.sharpinformatics.com/.



The fact type reading for this ORM diagram is:

The grant award with **<GrantAwardID>** is provided by funding organization with organization id of **<PartyID>** in the amount of **<FundingOrganizationAwardAmount>**.

The arrow over the Grant Award and Funding Organization objects means that there is a one-to-many (1:M) relationship between the combined objects and the Funding Organization Award Amount.

Natural Language Modeling allows these rules to be validated by only asking questions about the objects.

Given the populated fact type: "The grant award with grant award id **0123456789** is provided by funding organization with party id of **432423263** in the amount of **$250,000**" **is true:**

Q1.1. Can you have grant award with grant award id **0123455555** provided by funding organization with party id of **432423263** in the amount of **$250,000?—Yes**

Q1.2. Can you have grant award with grant award id **0123456789** provided by funding organization with party id of **432425555** in the amount of **$250,000?—Yes**

Q1.3. Can you have grant award with grant award id **0123456789** provided by funding organization with party id of **432423263** in the amount of **$400,000?—No**

The results of this analysis can be expressed as a matrix:

The grant award with **<GrantAwardID>** is provided by funding organization with organization id of **<PartyID>** in the amount of **<FundingOrganizationAwardAmount>**.

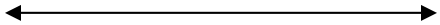
_____ ___	Grant Award <GrantAwardID>	Funding Organization <OrganizationID>	<FundingOrganization AwardAmount>	_____ _____
Instance	0123456789	432423263	$250,000	_____ _____

				Allowed?
Q1.1	another	432423263	$250,000	Yes
Q1.2	0123456789	another	$250,000	Yes
Q1.3	0123456789	432423263	another	No

A “yes” answer means that the entity is independent in the fact. A “no” answer means that the entity is dependent on one or more entities in the fact.

The Q1 matrix is the first step in the NLM procedure. Additional steps would result in finding that a room type is dependent upon both the room number and the building id. The resulting Table would be:

Funding Organization Grant Award



Grant Award <GrantAwardID>	Funding Organization <OrganizationID>	<FundingOrganization AwardAmount>

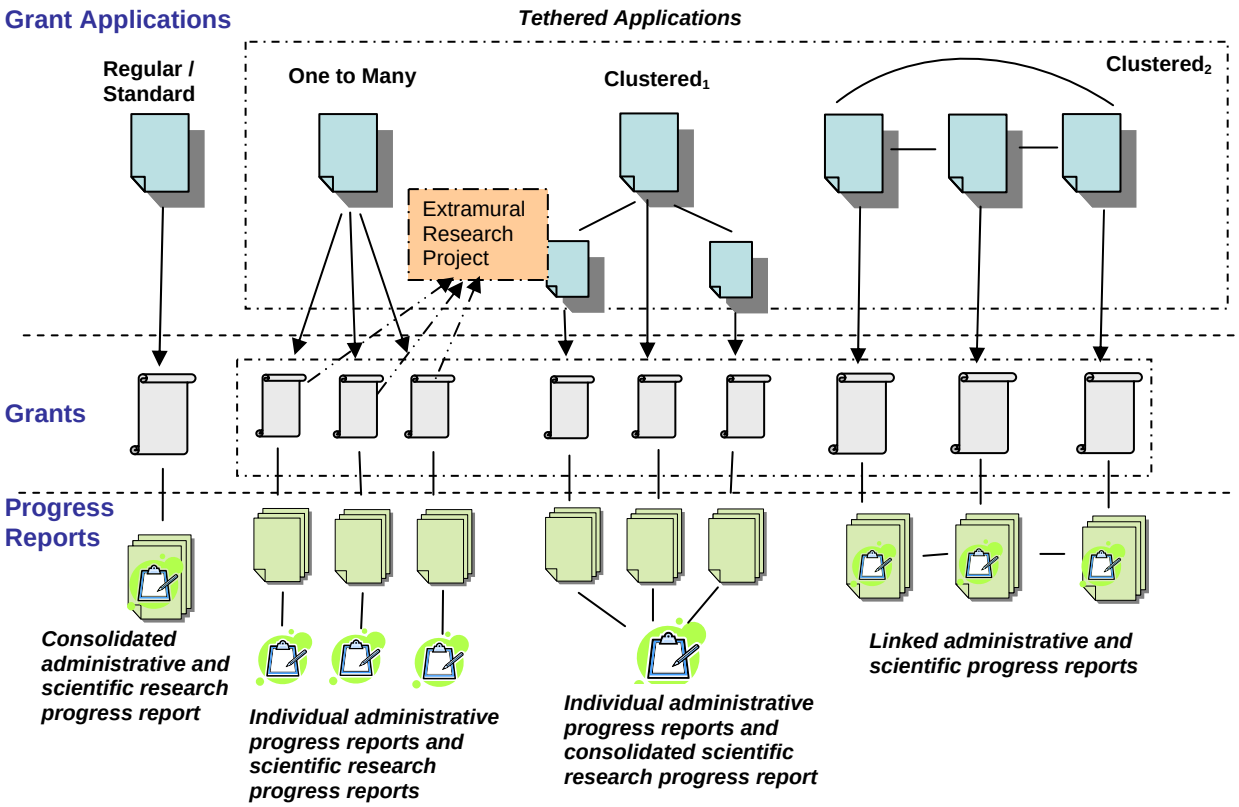
Appendix D: Grant Application Grouping Types

There are a number of emerging requirements for the management of grant applications and grants that will result in significant changes to the information requirements for supporting grants across their life cycle.

Multiple PIs
A key driver for these emerging needs is the desire to ensure that recognition for research efforts funded by NIH can be more broadly shared. This leads to a requirement for multiple Principal Investigators (PIs) for each application and awards. When multiple PIs exist for a grant application, a “contact PI” who serves as liaison between NIH and the grantee must be identified. The contact PI also is responsible for collecting and/or sending information to the other PIs in a multiple-PI grant. The grants CDM model defined in this NIHRFC allows for that flexibility to capture multiple PIs.

Tethered Applications and Linked Awards
Emerging needs to support more complex research efforts that may span multiple scientific disciplines and organizations have resulted in the development of new categories of related applications and grants. These new models for applications and grants are referred to as Tethered Applications and Linked Awards. Figure 18 shows the various types of linked awards and tethered applications that may exist.

Figure 18—Tethered Applications and Linked Awards



The models for linked awards and tethered applications can be divided into two main categories—*One-To-Many* and *Clustered*:

- In the One-To-Many model, an initial grant application is submitted as a single application. The application is comprised of many scientific components which ultimately will be awarded as separate grants. These separate grants will need to be linked throughout their life cycle in order to support NIH management process and reporting needs. Annual progress reporting on the grants will be provided as individual administrative (financial, invention, etc.) reports and individual scientific research progress reports.
- In the Clustered or "Many-to-Many" model, several separate applications are independently submitted, but are clustered together through the grants process until award. Clustered applications vary in how they are grouped together (shown as $Cluster_1$ and $Cluster_2$ in Figure 18).
    - In the $Cluster_1$ model, the set of applications is comprised of a lead application that is fully completed and a number of mini-applications linked to the lead application that may have only those characteristics that are unique to that mini-application. This cluster goes though the grants process as a unit and is awarded as separate grants. Annual reporting on the grants will be provided as individual administrative (financial, invention, etc.) reports and consolidated scientific research progress reports. In the event, one of these grants ends before planned

effort is completed, the other two linked grants would in most cases also be terminated because of the tight dependencies between the efforts.

- In the Cluster$_2$ model, the set of related applications is comprised of a grouping of complete applications that are linked together by the science. Each of these applications goes through the review process as individual applications and are awarded in the same manner as an ordinary grant, although it may be required that they be reviewed together by the same scientific review group. Throughout the review process and the ongoing grant management process, these grants are linked by the science. Annual reporting on these grants will be provided as consolidated administrative (financial, invention, etc.) and scientific research progress reports for each separate award. In the event that one of these grants ends before the planned effort is completed, the other linked grants can often continue until the time of their closeout.

The Grants CDM supports these emerging models through:

- A grouping capability that allows applications to be linked using a set of specified grouping types. This provides the flexibility to manage all the scenarios above without limiting the development of new grouping types.
- Linking grants to a single Extramural Biomedical Research Project. This conceptual separation between the funding supporting an effort, and the effort itself, allows for more flexible reporting and tracking of both the funding components of grants and the underlying scientific effort.

Appendix E: Grants.gov Terminology

The major changes to the terminology of the grant applications are reflected below:

New Grants.gov Term	Old NIH Term	Definition	Notes/Comments
New Application	New Application	A new grant application that must undergo a peer review.	An application that is submitted for funding for the first time. Includes multiple submission attempts within the same round. (Type 1)
Renewal	Competing Continuation	An application that extends a project period that would otherwise expire for one or more grant budget periods; applications are peer reviewed and compete for funding.	Previous years of funding for the project have elapsed. Competing for additional years of funding to continue original project. (Type 2)
Revision	Competing Supplement	A grants.gov term for money added to a grant to expand its scope or meet the needs of a research protocol. Applicants must apply and undergo peer review and compete for funds.	Request for additional funds for a current award to expand the scope of work. Applicants should contact the awarding agency for advice on submitting any revision/supplement application. (Type 3)
Resubmission	Revision or Amended Application	Grants.gov term for a grant application resubmitted to NIH after an investigator who did not succeed in getting funded revises it based on feedback from the initial peer review. Each resubmission has an entry in its application identification number, e.g., A1, A2. NIH limits applicants to two resubmissions.	Application previously reviewed. A revised or amended application addresses reviewer feedback. (A1/A2)
Continuation	Progress Report	Periodic, usually annual, report submitted by the grantee and used by NIH to assess progress and, except for the final progress report of a project period, to determine whether to provide funding for the budget period subsequent to that covered by the report.	NIH does not use the SF424 (R&R) for Continuation Applications. (Type 5; Progress Reports for Simplified Noncompeting [SNAP] are submitted directly to eRA Commons; for others, paper is still submitted)

Appendix F: Glossary of Entities and Attributes used in Grants CDM

#	Name	Definition	Source	Where Used
1	**Administrative Grant Action**	The act to oversee the non-financial aspects relevant to a grant in support of the scientific research.	OCITA	Grant Action
2	**Administering Organization**	The organization that is responsible for managing the grant and associated research.	OCITA	Roles and Organization, Grant Application, Grants, Grants Funding and Management
3	**Advisory Council/Board**	Chartered NIH institute advisory committee that performs second-level peer review, makes funding and policy recommendations, and helps develop research agendas. In addition to grants advisory action, additional boards may exist, such as the Advisory Council to the Director (ACD), which is made up of external experts who are to assist the NIH Office of Director in creation of major plans and policies, especially those related to allocation of NIH funds and resources (for example, pioneer awards). Advisory Board is interchangeably used with Advisory Council.	NIAID Glossary of Funding and Policy Terms and Acronyms	Roles and Organization
4	**Advisory Council Board Meeting**	A meeting held to perform second-level review, make funding and policy recommendations and help develop and provide concept clearance for research agenda.	OCITA	Advisory Council
5	*Council Meeting ID*	*A unique identifier for each council meeting held within a council round.*	*OCITA*	*Advisory Council*
6	*Council Round*	*At NIH, there are at least three, sometimes four, council rounds each fiscal year: October, January, May and sometimes August. Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For non-competing applications (types 3 and 5) there is the "00" council, which represents a fifth cycle.*	*OCITA*	*Advisory Council, Peer Review*
7	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*	*Advisory Council, Peer Review*
8	*Meeting Format*	*The format of the meeting is captured and tracked. For example, in person, video or teleconference, etc.*	*OCITA*	Advisory Council, Peer Review
9	*Meeting Title*	*A label or heading given to a meeting to designate its purpose.*	*OCITA*	Advisory Council, Peer Review

#	Name	Definition	Source	Where Used
10	**Advisory Council Member**	A member of the standing committee in each IC that provides the second level of grant application review following the Scientific Review Group (SRG).	eRA Glossary of Terms http://era.nih.gov/about/glossary.cfm#n	Roles and Organization
11	**Appeal**	A procedure for contesting an initial peer review of a grant application.	OCITA	Advisory Council
12	*Appeal ID*	*A unique identifier to represent the start of an appeal process by the applicant.*	*OCITA*	*Advisory Council*
13	**Attendee**	The personnel who attend the peer review meetings. This may be made up of external reviewers, SROs, etc.	OCITA	Roles and Organization
14	**Biomedical Research Project**	A basic and clinical investigation in biology or medicine.	Enterprise CDM NRFC 0025	Grant
15	**Extramural Research Project**	A biomedical research project funded by NIH and performed outside of NIH.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant
16	**Intramural Research Project**	A biomedical research project performed within NIH.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant
17	**Business Office Contact**	Designated personnel who are employed by the research institution to manage the business management of a particular grant.	OCITA	Roles and Organization
18	**Chairperson**	The presiding officer of an Advisory Council Board and Scientific Review Groups Under certain conditions, an Acting Chairperson may be needed.	OCITA	Roles and Organization
19	**Communication**	Any ad hoc written correspondence exchanged between the applicant and NIH during the course of the review of the grant application until it is awarded.	OCITA	Grant, Grant Application
20	*Communication ID*	*A unique identifier for the communications*	OCITA	Grant, Grant Application
21	**Competitive Segment Closeout**	Procedure to officially conclude a competitive segment after the end of a competitive segment. Program staff determines whether administrative actions and required work are complete and have been documented according to the federal records management requirements.	NIAID Glossary of Terms	Grant

#	Name	Definition	Source	Where Used
22	**Contact Principal Investigator**	A Principal Investigator from the research institution who serves as the liaison with NIH and the research team. He/She is responsible to provide relevant information to the other PIs of a multiple PI grant award.	OCITA	Roles and Organization
23	**Core Leader**	A person who takes on a leadership role in providing essential services on a research project. A multi-project application may include two types of core leader: scientific core leader and a single administrative core leader.	OCITA	Roles and Organization
24	**Council Executive Secretary**	An IC official who is responsible for setting the council priority and council recommended budget for grant applications eligible for an award based on Integrated Review Group (IRG) results.	OCITA	Roles and Organization
25	**Extramural Support Assistant**	While Extramural Support Assistant (ESA) is a role in multiple business areas, the definition here refers to the ESA role in the Peer Review business area. The efficient and effective management of a review group requires the cooperative efforts of the Scientific Review Officer (SRO) and the Extramural Support Assistants (ESAs). The SRO works with the ESA in preparing nomination slates; in processing, assigning and mailing applications to reviewers; in preparing for and managing meetings; and in preparing summary statements. The ESA's duties include processing applications promptly after they are received in the SRG office; preparing and mailing applications and supporting materials to reviewers; making arrangements for and taking budget and action notes at SRG meetings; entering accurate SRG data into the eRA system; ensuring that summary statements are properly prepared and released; maintaining office files; preparing nomination packages; scheduling office work to meet periodic deadlines; handling administrative details in the daily management of the office; and training Grants Clerks in the above-described procedures.	eRA Glossary of Terms http://era.nih.gov/about/glossary.cfm#g	Roles and Organization
26	**Fellow**	The recipient of a NIH training and research program award, referred to as a fellowship, where the NIH specifies the individual receiving the award for pre-doctoral studies or post-doctoral studies.	OCITA	Roles and Organization
27	**Financial Status Report**	Report showing the status of funds for a grant or cooperative agreement, mandatory for continued funding.	NIAID Glossary of Funding and Policy Terms and Acronyms	Grant Application

#	Name	Definition	Source	Where Used
28	*Financial Status Report ID*	*A unique identifier for financial status report as submitted by the applicant.*	*OCITA*	*Grant Application*
29	**Funding Grant Action**	The final act to confer funds as part of a grant aligned with a particular budget period for a particular biomedical research project. A change to the current terms and conditions on the Notice of Award can occur and a new Notice of Award is issued.	OCITA	Grant Action
30	*Payplan Actual Funded Amount*	*An amount that is provided to the applicant by each funding organization, which is appropriate to the project to be conducted. The program manager might provide the funds in the exact amount as requested, or s/he may apply discretionary funds in addition to the recommended funds.*	*OCITA*	*Grant Action*
31	*Total Actual Funded Amount*	*The final awarded amount per individual grant award as noted in the Notice of Award. Usually this value has been negotiated between the PI and the Grants Management Official and/or Scientific Program Manager and includes all amounts received from all the funding organizations.*	*OCITA*	*Grant Action*
32	**Funding Organization**	The organization that is interested in funding the research. Within NIH these are the Institutes and Centers, commonly called “ICs.” There are 27 Institutes and Centers that form the National Institutes of Health (NIH), which perform other roles as well in addition to the funding of the grants..	OCITA	Roles and Organization, Grant Application, Grants, Grants Funding and Management
33	**Grant**	Financial assistance from Public Health Service agency for approved activities. Performance responsibility rests primarily with a grantee with little or no government involvement in the research; term covers grants and cooperative agreements. A grant starts with the initial funding of a competitive segment. Each competitive segment will have a closeout. The grant will end with the closeout of the final competitive segment.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant, Grant Application, Grant Action
34	*Activity Code*	*A code to identify the award type. General categories include research grants, contracts, training, and fellowship. Activity codes are usually grouped into mechanisms.* *Often used interchangeably with activity code.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Grant, Grant Application*
35	*Competitive Segment*	*Period of grant support before an applicant must recompete for funds.* *A grantee must submit a competing application for additional funds at the end of the previous competitive segment.*	*OCITA*	*Grant*

#	Name	Definition	Source	Where Used
36	*Grant Abstract*	*A complete description of what the proposed research intends to accomplish. This description becomes the current abstract of the Grant after funding.*	*OCITA*	*Grant, Grant Application*
37	*Grant ID*	*A unique identifier for a grant.*	*OCITA*	*Grant Application, Grant Action*
38	*Grant Title*	*The title of the Grant Application that becomes the current Title of the Grant after the grant is funded.*	*OCITA*	*Grant, Grant Application*
39	*Grant Year*	*The sequence year of funding of a grant's competitive segment.*	*OCITA*	*Grant, Grant Application*
40	*Progress Report Summary*	*A summary of research work conveying the technical accomplishments on the grant and submitted by the grantee (research institution or individual).*	*OCITA*	*Grant, Grant Application*
41	**Grant Action**	Approved management decisions that result in changing the core information about the state of a grant in response to an external or internal request. Examples: funding, closeout, changes of PI, changes in institute (IC), no-cost extensions, and/or decision not to fund).	OCITA	Grant Action
42	*Grant Action ID*	*A unique identifier for the grant action taken.*	*OCITA*	*Grant Action*
43	**Grant Action Request**	A request for an action that may create or change a grant. Examples include grant application, revisions, resubmissions, renewals, etc. On the associated grants, changes can be research institution, PI, funding organization and mechanism.	OCITA	Grant Application
44	**Grant Application**	Application for financial assistance from a Public Health Service agency.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant, Grant Application, Grant Action
45	*Activity Code*	*A code to identify the award type. General categories include research grants, contracts, training, and fellowship. Activity codes are usually grouped into mechanisms.* *Often used interchangeably with activity code.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Grant, Grant Application*
46	*Application Status*	*The condition signifying the progress of a grant application in its life cycle from receipt to award.*	*OCITA*	*Grant Application*
47	*Competing Application Flag*	*An indicator to show the whether the grant application is competing or non-competing when submitted.*	*OCITA*	*Grant Application*
48	*Grant Abstract*	*A complete description of what the proposed research intends to accomplish. This description becomes the current abstract of the Grant after funding.*	*OCITA*	*Grant, Grant Application*

#	Name	Definition	Source	Where Used
49	*Grant Application ID*	*An identifier for a grant application that is not derived from other information about the Grant.* *Note: The current Appl_ID as implemented in eRA and other NIH systems is derived from other information about the grant. In the future, it is useful to have an ID that does not contain such information. This will result in more flexible systems. This is not intended to reflect the current systems identifier.*	*OCITA*	*Grant Application, Grant Action*
50	*Grant Application Grouping Role*	*A role played by the grant application within a grouping.* *For example—a lead grant application or a supporting grant application.*	*OCITA*	*Grant Application*
51	*Grant Narrative Abstract*	*A written abstract that describes the public health relevance of the proposed research in layman's terms.*	*OCITA*	*Grant, Grant Application*
52	*Grant-Specific Aims*	*Statement of the objectives and milestones of a research project in a grant application.*	*OCITA*	*Grant Application*
53	*Grant Technical Content*	*The section of a grant application that specifies the research effort that is to be undertaken.*	*OCITA*	*Grant Application*
54	*Grant Title*	*The title of the Grant Application that becomes the current Title of the Grant after the grant is funded.*	*OCITA*	*Grant, Grant Application*
55	*Progress Report Summary*	*A summary of research work conveying the technical accomplishments on the grant and submitted by the grantee (research institution or individual).*	*OCITA*	*Grant, Grant Application*
56	*Resubmission Flag*	*An indicator to show whether the grant application is a resubmission of a previous application.* *Examples: S1 and S2.*	*OCITA*	*Grant Application*
57	**Competing Grant Application**	A new grant application that must undergo a peer review.	OCITA	Grant Application, Peer Review, Advisory Council
58	*Conflict Of Interest Type*	*A type of conflict of interest that people have with a grant application.. NIH provides regulations to ensure employees, scientific review group members and advisory council members or other having the ability to influence funding decision have no personal interest in the outcomes* *The types of conflicts of interest could be financial, career, including interests of family members that could be advanced by participation on advisory boards/councils.*	*OCITA*	*Grant Application, Peer Review, Advisory Council*
59	*Council Result*	*The funding and policy result for an individual application provided by the Advisory Council based on the second-level review.*	*OCITA*	*Grant Application, Peer Review, Advisory Council*

#	Name	Definition	Source	Where Used
60	*Intent To Pay Value*	*The amount obligated by authorized funding organization staff for the funding of a research grant.*	*OCITA*	*Grant Application, Peer Review, Advisory Council*
61	*Priority Score*	*Average of individual ratings of scientific merit given by reviewers of an initial peer review scientific review group. Priority scores range from 100 (outstanding) to 500 (acceptable).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Grant Application, Peer Review, Advisory Council*
62	**Grant Application Council Result**	A composite/associative entity that allows a council meeting to assign properties to a grant application.	OCITA	Advisory Council
63	*Council Recommendation*	*Council recommendations include decisions on whether or not to fund, and other recommendations such as how to resolve the barriers to funding before the application can be funded. Value Constraints: concur, non-concur, defer.* *Note: "Defer" sends the grant applications to the next council review.*	*OCITA*	*Advisory Council*
64	*Council Recommendation Explanation*	*Explanations provided by the Council to resolve the barriers to funding.*	*OCITA*	*Advisory Council*
65	*Early Concurrence Flag*	*Agreement by the advisory council with the initial peer review group recommendations for funding approval.*	OCITA	*Advisory Council*
66	*Program Priority*	*Applications are assigned a program priority to pay for some grants that fall below the automatic payline that have high program relevance. Value Constraints: HPP (High Program Priority); LPP (Low Program Priority).*	*OCITA*	*Advisory Council*
67	**Grant Application Review Result**	A composite/associative entity that allows the tracking and assigning of results (percentile score, summary statements, etc.) of the scientific review meeting to a grant application for each fiscal year in which the application is evaluated.	OCITA	Peer Review
68	*Evaluation Remarks Critique*	*Written evaluations that reviewers prepare before an initial peer review meeting. Critiques are presented to the scientific review group at the meeting and are incorporated into the Summary Statement report by the SRO. It recommends a priority score (or deems not recommended for further consideration) and addresses the requested budget, initial peer review criteria, progress made (for a renewal), and responses to the critique from a previous review (for an amended application).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Peer Review*

#	Name	Definition	Source	Where Used
69	*Percentile Score*	*Ranking used by NIH institutes to set regular grant application paylines and make funding decisions. A percentile shows the relative position of each application's priority score among all scores assigned by a scientific review group at its last three meetings. The range is 0.1 to 100.0; lower numbers represent better scores.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Peer Review*
70	*Priority Score*	*Average of individual ratings of scientific merit given by reviewers of an initial peer review scientific review group. Priority scores range from 100 (outstanding) to 500 (acceptable).*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Peer Review*
71	*Summary Statement*	*Official document showing the outcome of initial peer review, including priority score (and percentile for an R01), codes if areas of concern (e.g., human subjects research), and a recommended budget.* *Most summary statements also have a short synopsis prepared by a scientific review officer using peer reviewer critiques.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Peer Review*
72	*Top/Bottom Ranking*	*Basis for assessing the scientific merit of NIH research grant applications for initial peer review.* *Value Constraints: Top Ranked; Bottom Ranked.*	*NIAID Glossary of Funding and Policy Terms and Acronyms*	*Peer Review*
73	**Grantee**	The recipient of the grant award (or grant funding action) can be a research institution and/or individual. The organization or individual awarded a grant (received funds to conduct or currently conducting biomedical research) or cooperative agreement by NIH that is responsible and accountable for the use of the funds provided and for the performance of the grant-supported project or activities. The grantee is the entire legal entity even if a particular component is designated in the award document. The grantee is legally responsible and accountable to NIH for the performance and financial aspects of the grant-supported project or activity.	http://grants.nih.gov/grants/glossary.htm#F32	*Roles and Organization*
74	**Grant Final Approval Official**	The highest signing authority for approving the payplan. These can be the Extramural Director of ICs and/or Director of an IC or Branch.	OCITA	Roles and Organization

#	Name	Definition	Source	Where Used
75	**Grants Management Official (GMO)**	An NIH official responsible for the business management aspects of grants and cooperative agreements, including review, negotiation, award and administration, and for the interpretation of grants administration policies and provisions. Only GMOs are authorized to obligate NIH to the expenditure of funds and permit changes to approved projects on behalf of NIH. Each NIH Institute and Center that awards grants has one or more GMOs with responsibility for particular programs or awards. Sometimes also known as Grants Management Officer.	NIAID Glossary of Funding and Policy Terms and Acronyms	Roles and Organization
76	**Grants Management Specialist (GS)**	A Grants Management Specialist (GS) is an agent of the Grants Management Officer (GMO) and is assigned responsibility for the day-to-day management of a portfolio of grants. The Grants Management Specialist is the IC staff member who is the focal point for all business and policy activities associated with the negotiation, award and administration of a grant or cooperative agreement, and who interprets and applies grants policies.	eRA Glossary of Terms http://era.nih.gov/about/era/glossary.cfm#g	Roles and Organization
77	**Grouping**	An aggregation of grant applications and/or grants that are managed together; possibly because they are related in the science. This reflects the emerging needs of NIH to support collaborative science and examples include one-to-many and clustered applications. This flexible grouping allows for complex mechanisms	OCITA	Grant, Grant Application
78	**Grant Application Grouping**	A collection of grant application that are considered to be related in the science of research.	OCITA	Grant Application
79	**Grant Grouping**	A collection of the grants that are considered to be related in the way the awards are linked.	OCITA	Grant
80	*Grouping ID*	*A unique identifier of a grouping.*	*OCITA*	*Grant, Grant Application*
81	*Grouping Rule*	*A collection of rules that provide the basis for the relationships of a grouping.*		*Grant, Grant Application*
82	**Grouping Type**	An indicator to reflect as belonging to a member of a higher class. Examples include grant grouping and grant application grouping.	OCITA	Grant, Grant Application
83	*Grouping Type ID*	*A unique identifier for grouping type.*	*OCITA*	*Grant, Grant Application*
84	*Grouping Type Rule*	*A collection of rules that provide the basis for the relationships of the grouping type.*	*OCITA*	*Grant, Grant Application*
85	*Grant Grouping Member*	*A record of the membership of a grant in a grant grouping.*	OCITA	Grant

#	Name	Definition	Source	Where Used
86	*Grant Grouping Role*	*The role a grant plays within a managed grouping of grants.*	OCITA	*Grant*
87	**Grant Application Grouping Member**	A record of the membership of a grant application in a grant application grouping.	OCITA	Grant Application
88	*Grant Application Grouping Role*	*A role played by the grant application within a grouping. For example—a lead grant application or a supporting grant application.*	*OCITA*	*Grant Application*
89	**Invention Report**	A report that must submitted to NIH to report any inventions made during the course of the grant (competing grant application or non-competing progress report).	OCITA	Grant
90	*Invention Report ID*	*A unique identifier for the invention report submitted by the applicant.*	*OCITA*	*Grant*
91	**Integrated Review Group (IRG)**	A group/collection of review study sections organized around a similar area of science that performs initial peer review in the NIH Center for Scientific Review (CSR).	NIAID Glossary of Funding and Policy Terms and Acronyms	Roles and Organization
92	**Lead Grants Management Official**	A Grant Management Official who serves as the final signatory authority in the case of multiple funding organizations.	OCITA	Roles and Organization
93	**Member**	An individual who belongs to peer review groups and advisory councils boards.	OCITA	Roles and Organization
94	**Opportunity Announcement (OA)**	A funding opportunity announcement (FOA) is a notice in Grants.gov of a federal grant funding opportunity. Grants.gov lets organizations apply for grants for more than 1,000 grant programs from 26 federal agencies. NIH FOAs can be program announcements or requests for applications (RFAs). An official announcement from NIH of a grant or contract research opportunity, for which interested parties may apply.	NIAID Glossary of Funding and Policy Terms and Acronyms and NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant Application, Grant Funding and Management
95	*OpportunityAnnouncementID*	*A number assigned to the Grants.gov notice of a federal grant funding opportunity at NIH. FOAs can be Request for Applications (RFAs) or Program Announcements (PAs).*	*OCITA*	*Grant Application, Grant Funding and Management*
96	*Opportunity Announcement Funds Available*	*The amount of funds set aside when an opportunity announcement decision has been made within NIH and is published.*	*OCITA*	*Grants Funding and Management*

#	Name	Definition	Source	Where Used
97	*Opportunity Announcement Title*	*The name of the opportunity announcement.*	*OCITA*	*Grants Funding and Management*
98	**Organization**	A formal grouping of people and/or business units coordinated to perform a specific purpose or obtain a specified objective.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Roles and Organization
99	**Party**	Information about people, organizations, and other actors in NIH processes, and their roles.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Roles and Organization
100	*Party ID*	*A unique identifier of a Party.*	*OCITA*	*Roles and Organization*
101	*Party Type*	*An indicator to reflect as belonging to a member of a higher class. Examples include person or organization.*	*OCITA*	*Roles and Organization*
102	**Payplan**	A description of the budgetary and/or financial plans set at the beginning of the fiscal year based on the number of grants expected to be funded.	OCITA	*Grants Funding and Management*
103	*Payplan ID*	*A unique identifier for the payplan within a fiscal year.*	*OCITA*	*Grants Funding and Management*
104	*Council Round*	*At NIH, there are at least three, sometimes four, council rounds each fiscal year: October, January, May and sometimes August. Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For non-competing applications (types 3 and 5) there is the "00" council, which represents a fifth cycle.*	*OCITA*	*Grants Funding and Management*
105	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*	*Grants Funding and Management*
106	**Payplan Budget Item**	The specific budget line item containing information about a grant application on a payplan for a fiscal year.	OCITA	Grants Funding and Management
107	*Payplan Budget Item ID*	*A unique identifier for the specific line item within a payplan.*	*OCITA*	*Grants Funding and Management*
108	*Grant Award Decision Flag*	*An indicator for a specific budget line item within the funding organization's payplan which has been approved for funding of a grant.*	*OCITA*	*Grants Funding and Management*
109	*Payplan Requested Amount*	*An amount noted in the grant application asking for funds to work on a research project.*	*OCITA*	*Grants Funding and Management*

#	Name	Definition	Source	Where Used
110	*Payplan Recommended Amount*	*An amount suggested by the funding organization based on the received technical score that falls within the funding organizations' budget .*	*OCITA*	*Grants Funding and Management*
111	*Payplan Actual Funded Amount*	*An amount that is provided to the applicant by each funding organization which is appropriate with the project to be conducted.* *The program manager might provide the funds in the exact amount as requested or s/he may apply discretionary funds in addition to the recommended funds.*	*OCITA*	*Grants Funding and Management*
112	*Tentative Intent Amount*	*An amount of funds that are anticipated to be awarded to the applicant but have not yet been approved for funding.*	*OCITA*	*Grants Funding and Management*
113	*Tentative Intent Flag*	*A flag that denotes the grant application that has been approved and has a technical score that falls within the funding organization's budget, but has not yet been funded for the current cycle round.*	*OCITA*	*Grants Funding and Management*
114	**Principal Investigator (Program Director or Project Director) (PI)**	Any individual judged by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program supported by the grant. Each principal investigator is responsible and accountable to the grantee organization for the proper conduct of the project or program including the submission of all required reports. Qualified person who is designated by a grantee to direct a research project or program supported by NIH and who usually writes the grant application. PIs oversee scientific and technical aspects of a grant and the day-to-day management of the research. PIs do not have to be employees of a grantee organization, but these parties must have a written agreement specifying their relationship. The Grants.gov term is principal investigator/project director.	Multi-PI Workgroup NIAID Glossary of Funding and Policy Terms and Acronyms	Roles and Organization
115	**Person**	Any individual of interest to the NIH for which the NIH maintains information.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Roles and Organization
116	**Publication**	The output of the research grants usually published as scientific papers and also updated into PUBMED (a service of the NIH Library of Medicine providing access to citations and journals).	OCITA	Grant

#	Name	Definition	Source	Where Used
117	*Publication ID*	*A unique identifier for the published materials from the grants research.*	*OCITA*	*Grant*
118	**Referral Officer**	NIH or IC official responsible for overseeing the referral process.	OCITA	Roles and Organization
119	**Requested Grant Budget**	An amount (including direct and indirect costs) applied for in the grant application by the applicant to conduct the research. The pay plan requested budget item may be a line item in this budget plan.	OCITA	Grant Application
120	*Requested Grant Budget ID*	*A unique identifier for the grant budget as requested by the applicant.*	*OCITA*	*Grant Application*
121	**Requested Management Change**	Requested management changes to a grant application. Examples of requested changes include changes to mechanisms, research institutions, institute or center, and/or principal investigator.	OCITA	Grant Application
122	**Researcher**	An individual who performs extensive investigations and experiments to discover or revise scientific theories and facts.	OCITA	Roles and Organization
123	**Research Initiative**	An area of science in which NIH has chosen to fund research. This results in opportunity announcements such as request for applications (RFA), request for proposals (RFP) or program announcements (PAs).	OCITA	Grants Funding and Management
124	*Research Initiative ID*	*A unique identifier of a research initiative.*	*OCITA*	*Grants Funding and Management*
125	*Research Initiative Title*	*The name of the research initiative.*	*OCITA*	*Grants Funding and Management*
126	**Research Initiative Funds**	The monies set aside to fund the applications responding to an RFA or RFPs.	OCITA	Grants Funding and Management
127	*Research Initiative Funds ID*	*A unique identifier for set aside funds in a research initiative.*	*OCITA*	*Grants Funding and Management*
128	*Available Initiative Funds*	*The available monies to fund applications responding to the RFAs and RFPs.*	*OCITA*	*Grants Funding and Management*
129	**Research Institution**	An organization that conducts biomedical research and may have agreements with the grantee in conducting specific research areas.	OCITA	Roles and Organization
130	**Research Taxonomy**	A system of classification for medical research that structurally defines the research areas of interest or other categorizations for research. This will also include disease categories	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Grant Application
131	*Research Taxonomy ID*	*A unique identifier for the research taxonomy.*	*OCITA*	*Grant Application*

#	Name	Definition	Source	Where Used
132	**Reviewers**	A person participating in the peer review process who reads a grant application thoroughly, writes and distributes a critique of it to the SRG for discussion purposes at the meeting. Reviewers can be of multiple kinds: One, Two, Three or N number. – alternatively they may be also known as primary, secondary (who serves as backup to the primary reviewer and may write a critique) and a reader (who serves as backup to the primary and secondary reviewers and does not necessarily prepare a critique) or discussers, mail reviewers and telephone reviewers.	OCITA	Roles and Organization
133	**Role**	An assigned grouping of Parties that provides permissions and responsibilities for actions.	NIH Enterprise Conceptual Data Model NRFC0025/STD0012	Roles and Organization
134	*RoleName*	*A short description specifying the role.*	*OCITA*	*Roles and Organization*
135	**Scientific Program Manager (Program Official)**	The NIH official responsible for the programmatic, scientific, and/or technical aspects of a grant. In some ICs, the scientific program manager may also be known as Program Director, Medical Officer or Health Scientist Administrator (HSA).	NIH Glossary http://grants2.nih.gov/grants/glossary.htm	Roles and Organization
136	**Scientific Review Group (SRG)**	Component of an NIH Center for Scientific Review and ICs integrated review group organized around a scientific area, which conducts initial peer review in that field. Composed of non-NIH scientific experts, study sections are managed by CSR or IC specific scientific review officers or directors. SRGs can be Chartered SRGs (or study sections) with a core of standing members, recurring Special Emphasis Panels (SEPs) or non-recurring Special Emphasis Panels.	OCITA	Roles and Organization
137	**Scientific Review Group Meeting**	A composite/associative entity that identifies a scientific review group meeting where a group of scientists review grant applications. The meetings are conducted by NIH Staff, SROs who are usually doctoral-level scientists who have previously conducted research in the scientific disciplines of their scientific review group and 10 to 20 extramural scientists who are able to evaluate the grant applications assigned to their scientific review group.	OCITA and OER http://grants1.nih.gov/training/q&a.htm	Peer Review

#	Name	Definition	Source	Where Used
138	*Council Round*	*At NIH, there are at least three, sometimes four, council rounds each fiscal year: October, January, May and sometimes August. Application receipt dates, initial review dates and council review dates all fall within one of these council rounds.* *For non-competing applications (types 3 and 5) there is the "00" council, which represents a fifth cycle.*	*OCITA*	*Advisory Council, Peer Review*
139	*Fiscal Year*	*The fiscal year is the accounting period of the federal government. It begins on October 1 and ends on September 30 of the next calendar year.*	*http://www.rules.house.gov/archives/98-325.pdf*	*Advisory Council, Peer Review*
140	*Meeting Title*	*A label or heading given to a meeting to designate its purpose.*	*OCITA*	*Advisory Council, Peer Review*
141	*Meeting Format*	*The format of the meeting is captured and tracked. For example, in person, video or teleconference, etc.*	*OCITA*	*Advisory Council, Peer Review*
142	*Meeting Location*	*The site where the meeting is held. For example, this may be a city, state, building, room, etc.*	*OCITA*	Advisory Council, Peer Review
143	**Scientific Review Group Member**	A technical professional who is assigned to review grant applications as part of a study section or scientific review group. The scientific reviewer is a type of scientific review group member and can be a reviewers: One, Two, Three or alternatively known as primary peer reviewer, secondary peer reviewer, or a reader (tertiary peer reviewer). The reviewers are scientists who review grant applications or contract proposals. This includes the scientific review group chair, who leads the discussions.	OCITA	Roles and Organization
144	**Scientific Review Officer (SRO) or Scientific Review Director (SRD)**	Federal scientist who presides over a scientific review group and coordinates and reports the initial peer review of each grant application assigned to it. Scientific Review Officer act as intermediaries between PI applicants and reviewers and prepare summary statements for all applications reviewed. Also see scientific review group. May also be known as Health Scientist Administrator (HSA).	NIAID Glossary of Funding and Policy Terms and Acronyms	Roles and Organization

#	Name	Definition	Source	Where Used
145	**Signing Official**	A Signing Official (SO) has institutional authority to legally bind the institution in grants administration matters. The individual fulfilling this role may have any number of titles in the grantee organization. The label "Signing Official" is used in conjunction with the NIH eRA Commons. The SO can register the institution, and create and modify the institutional profile and user accounts. The SO also can view all grants within the institution, including status and award information. An SO can create additional SO accounts as well as accounts with any other role or combination of roles. For most institutions, the Signing Official (SO) is located in its Office of Sponsored Research or equivalent. The NIH term, Institutional Business Official, may still be used.	http://grants.nih.gov/grants/glossary.htm#P	Roles and Organization
146	**SubGrant**	A subgrant may be funded directly or indirectly by a grant and includes information about participants and their roles. The subgrant may receive a specific review assignment and assessment (score and/or summary).	OCITA	Grant
147	**SubGrant Application**	A grant application that is submitted as part of another grant but may be independently reviewed and awarded. This is similar to a grant application (for title and summary) and must be tied to a specific grant application. This is an expansion of the current concept for sub-projects and includes additional rules for grouping of grant applications	OCITA	Grant Application
148	*Scoring Flag*	*An indicator to specify whether the subgrant application has to be scored individually during the review process.*	*OCITA*	*Grant Application*
149	**SubGrant (Project) Leader**	A leader on a research project who has the responsibility of planning and executing the tasks associated with the sub-project.	OCITA	Roles and Organization
150	**Theme**	An overarching categorization of subjects of importance to NIH to enhance the disease- and mission-specific activities. These have been identified as part of the NIH Road Map.	OCITA	Grants Funding and Management
151	*Theme ID*	*A unique identifier of a theme.*	*OCITA*	*Grants Funding and Management*
152	**Trainee**	Target investigators (as opposed to health professionals) in fields where there is an identified need for biomedical and behavioral research personnel receiving funding from NIH	http://grants2.nih.gov/training/career_progress/chapter1.pdf.	Roles and Organization

Appendix G: Document Revision History

Section 1—Introduction

- Revised the entire section to simplify the purpose and scope of the Grants CDM
- Revised the introduction of this section to explicitly state that the Grants CDM is a standard, once approved
- Inserted Language on Benefits of CDM and the usage of CDM (compliance)

Section 2—Context of Grants Data Architecture Overview

- Moved this main section as a subsection into Grants CDM overview

Section 3—Grants CDM Overview

- Moved the Context of the Grants Data Architecture Overview as a subsection
- Revised the section Grants CDM inputs
- Deleted a subsection called—Grants Business Context
- Expanded the Grants CDM Content and Structure to clarify the inherited entities and relationships from the previous NIH standards (enterprise CDM and people)
- Added a new section—Key Grants CDM Entities and Structures—to explain the concepts that are integral to providing the flexibility as required by NIH

Section 4.1—Roles and Organization (Now Revised Section 3.1)

- Revised the entire section to explain flexibility the model provides in creating roles and role types
- Inserted new ORM model to reflect the changes
- Added language to show the benefit of capturing the history of the researchers and the roles they play in the life cycle of the grant
- Revised Initial Review Group to Integrated Review Group and updated the definition
- Revised Advisory Council to Advisory Council Board and updated the definition
- Revised Research Institution to Grantee and updated the definition
- Revised Study Section to Scientific Review Group and updated the definition
- Revised Scientific Review Administrator to Scientific Review Officer and/or Scientific Review Director and updated the definition
- Revised the Study Section Member to Scientific Review Group Member and updated the definition
- Added new entities and definitions—Special Emphasis Panels, Core Leader, Extramural Support Assistant, IRG Chief, Project Leader
- Updated Principal Investigator and other terms used—Program Director and/or Project Director

Section 4.2—Grant Application (Now Revised Section 3.2)

- Revised this section to include the correct terminology as mandated by grants.gov
- Combined the grant entity and attributes tables into a single table for easier reading
- Revised the definitions for Grant

- Added new entities and definitions—Competing Initial Grant Application, Financial Status Report, Grant Action Request (which includes Requested Management Changes and Grant Application), Grouping, Grant Application Grouping, Grant Grouping, Grouping Type, Grant Application Grouping Member, Research Taxonomy, Requested Grant Budget, SubGrant Application
- Deleted the roles—Principal Investigator, Business Office Contact, Signing Official and Referral Officer. These were replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Deleted the following entities and definitions as these were replaced by Grant Action Request—Non-competing grant change requests, non-competing renewal grant change request, non-competing supplemental grant change request, non-competing requested management change request
- Added new attributes and definitions—Communications, Competing Application Flag, Early Concurrence Flag, Financial Status Report ID, Grant Application Grouping Role, Grant Narrative Abstract, Resubmission Flag, OpporAnnoucementID, Scoring Flag, Grouping Rules, Grouping Type Rules
- Revised the attribute name and definition from Application Code to Application Status
- Updated the attribute name and definition—Progress Report Summary
- Deleted attributes and definition—Accession Number, Appl_ID, Grant Application Relationship Type
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Section 4.3—Peer Review (Now Revised Section 3.6)

- Changed the name for the section to Peer Review from Study Section Meeting
- Revised the introduction of this section to clarify the process and context
- Deleted the roles—Study Section Member, Scientific Review Administrator and Grants Technical Assistant. These were replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Revised Grant Application Study Section Meeting to Grant Application Review Result and updated the definition
- Revised Study Section Meeting to Scientific Review Group Meeting and updated the definition
- Added new attributes and definitions—Meeting Title, Meeting Format, IRG Meeting number, Summary Statement
- Updated attributes and definitions—Evaluation Remarks Critique, Review Recommendation (formerly known as Application Status), Council Round
- Deleted attributes—Cycle Number, Meeting Summary Statement, Project Summary
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Section 4.4—Advisory Council (Now Revised Section 3.7)

- Revised the introduction of this section to clarify the process and context. Also included details around the appeals process.

- Deleted the roles—Advisory Council Member, Council Executive Secretary. These were replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Added additional entities and definitions—Appeal, Meeting Title, Meeting Format, Council Round
- Added additional attributes and definitions—Appeal ID, Meeting ID, Early Concurrence Flag
- Deleted attributes—Cycle Number
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Section 4.5 Grants Funding and Management (Now Revised Section 3.4)

- Revised the introduction of this section to clarify the payplans and process on how they are formulated
- Deleted the roles—Grant Final Approval Official, Scientific Program Manager and Grants Management Specialist. These were replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Added additional entities—Payplan Budget Item, Research Initiative, Research Initiative Funds
- Added additional attributes—Grant Award Decision Flag (formerly known as Payplan Budget Item Flag), Opportunity Announcement Funds, Opportunity Announcement Title, Payplan ID, Payplan Requested Amount, Payplan Recommended Amount, Payplan Actual Funded Amount, Tentative Intent Amount, Tentative Intent Flag, Research Initiative ID, Research Initiative Funds ID, Research Initiative Title, Available Initiative Funds, Theme ID
- Deleted attributes—Cycle Number, Payplan Budget Item Amount, Scientific Program Name, Project Relationship Type
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Section 4.6—Grant Action (Now Revised Section 3.5)

- Renamed the Section to Grant Action from Grant Award
- Revised the introduction section to describe the rationale for the non-inclusion of detailed budgetary related information
- Deleted the role—Grants Management Official. This was replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Added a new entity Grant Action, of which Funding Grant Action and Administrative Grant Actions are subtypes
- Revised the attribute Grant Award ID to Grant Action ID and updated the definition
- Revised the attribute Total Grant Award to Total Actual Funded Amount and updated the definition
- Revised the definition of Fiscal Year
- Added the attributes and definitions—Grant ID, Grant Action ID, Payplan Actual Funded Amount, Total Actual Funded Amount

- Deleted the attribute and definition—Funding Organization Funding Amount, Grant Award Extension
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Section 4.7—Grant (Now Revised Section 3.3)

- Deleted the roles—Principal Investigator, Signing Official, Business Office Contact, Scientific Program Manager, Grants Management Specialist and Grants Management Official. These were replaced by Person and Role in order to provide the flexibility of different roles to participate at different times.
- Added additional entities and definitions—Biomedical Research Project (which includes Extramural Research Project and Intramural Research Project), Communication, Competitive Segment Closeout, Publication, SubGrant, Grant Grouping, Grant Grouping Member, Research Taxonomy
- Added new attributes and definition—Competitive Segment, Grant Abstract, Grant ID, Grant Title, Grant Year, Activity Code, Progress Report Summary, Grant Grouping Role, Publication ID, Research Taxonomy ID
- Revised the Progress Report to Progress Report Summary and updated the definition
- Inserted new ORM model to reflect the changes
- Revised fact types to reflect the new model

Restructured the Appendices as follows:

- Appendix A—Comprehensive ORM Model – ORM Notation
- Appendix B—Comprehensive CDM Model – ERD Notation
- Appendix C—Data Modeling Tutorial
- Appendix D—Grouping of Applications
- Appendix E—Grants.gov Terminology
- Appendix F—Glossary of Entities and Attributes
- Appendix G—Document Revision History