SAP Sybase PowerDesigner

Building a Better Data Dictionary with SAP® Sybase® PowerDesigner®

Achieving Consistency and Reusability

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The Best-Run Businesses Run SAP™

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How Modeling Adds Value to a Data Dictionary

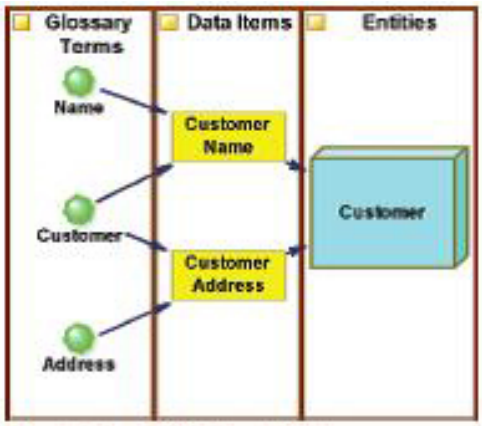
As organizations move to managing information as a first-class corporate asset, the primary challenge will not be in just finding the right sources of the information from the right systems, but in identifying and attributing the right meaning to that data. Data dictionaries let you standardize data content, context, and definitions to achieve consistency and reusability as well as drive quality information into new or existing tactical and strategic business initiatives.

A data dictionary will provide:

- Easier integration and communication between systems
- More standardized messaging between applications
- Higher-quality business intelligence and analytics
- Better understanding between all subject matter experts

The building blocks of the data dictionary include business glossary terms, their use to define names for data elements, data items and their use as entity attributes, and entity relationships and the definitions for each (see Figure 1). Data dictionaries ensure consistency of use throughout the organization by providing a common business language and "single version of the truth" for all common data elements used across the enterprise.

Figure 1: Terms to Data Items to Entities



BEST PRACTICES TO CONSIDER WHEN ESTABLISHING A DATA DICTIONARY

Some best practices to consider when establishing a data dictionary include the following:

- As the content of the data dictionary matures over time, version control becomes important. Keeping track of what version of the data dictionary a project has derived its data implementation from will help others to understand why definitions may differ and how to rectify differences during integration, federation, and business intelligence transformation projects. Repositories will be very helpful in managing versions and configurations of models, to ensure that old versions remain referenced.
- Data dictionaries will transform over time, and a good design will accommodate that. Best practices include not overloading any single concept, making it easy to reuse and easy to maintain.
- If a concept becomes obsolete, do not reuse it to avoid confusion with legacy implementations. It is important to allow for any data concept to expand over time and, therefore, important to have a clear alignment between data entities and their attributes. Normalization processes are used to achieve this alignment.
- Taxonomies and related terminologies will differ between business units, organizations, and companies. Minimize mappings across all these different terminologies. It is nearly impossible to avoid having a need to share a common definition to different dictionary terms. Use aliases or synonyms to support the need to have different names for the same data concept and mappings between data concepts.

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Requirements for the Data Dictionary

Preparing the data dictionary needs to take certain key criteria into account. The following list identifies the most common requirements for supporting the storage and maintenance of the data dictionary and additionally includes the workflow and processes that support the creation and management of the information:

- A hierarchical list of business glossary terms, aliases, and relationships between terms
- A unique list of entities and data items
- Descriptions of data artifacts
- Entity-attribute relationships resulting from a data item being assigned to describe an entity or entities
- Entity-to-entity relationships

HIERARCHICAL LIST OF BUSINESS GLOSSARY TERMS

To improve business alignment, the enterprise glossary in SAP® Sybase® PowerDesigner® software helps ensure that business terms and definitions are established and consistently managed throughout all models to help ensure everyone is "speaking the same language." Glossary terms are defined within a hierarchical classification system, and terms may relate to other terms (see Figure 2). The SAP Sybase PowerDesigner enterprise glossary offers "preferred" terms for data identification whenever a new or alias term is encountered, to keep the number of instantiations of terms down to a minimum.

UNIQUE LIST OF ENTITIES AND DATA ITEMS

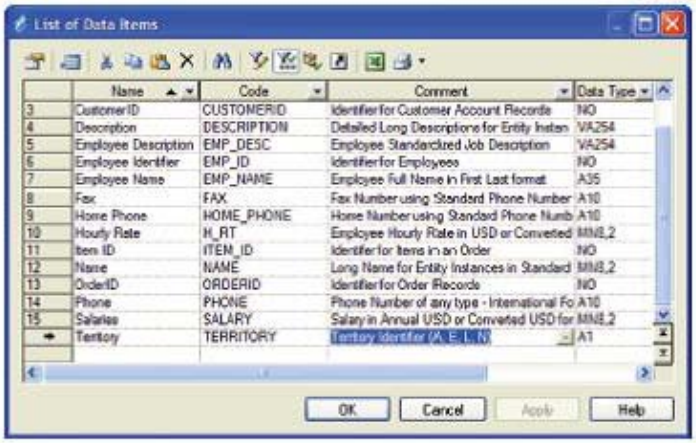
The SAP Sybase PowerDesigner meta-model maintains a single definition of each dictionary object (for example, there is only one definition of "customer") no matter where it is subsequently used throughout the enterprise. SAP Sybase PowerDesigner allows for a single concept (model, diagram) to be defined once and reused wherever needed, as appropriate.

DESCRIPTIONS OF DATA ARTIFACTS

The SAP Sybase PowerDesigner meta-model contains all key fields needed to complete the standard descriptions of data dictionary items, including separate comments, rich-text notes and annotations, editor and creator metadata, versioning information, and more (see Figure 3). For additional details not already provided by SAP Sybase PowerDesigner, administrators can configure extended model definitions that provide extended attributes and custom forms to make user management of added metadata fields easier and natural.

Figure 2: Hierarchical Classification System

Figure 3: Key Fields for Standard Descriptions of Data Dictionary Items



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ENTITY-ATTRIBUTE RELATIONSHIPS

The conceptual data model (CDM) is designed to have a list of data items independent of entity attribute participation. This can be taken advantage of in a number of ways. By disallowing reuse, users can be sure that a data item represents an entity attribute only once. Users can scan the model for data items that are not yet participating as an entity attribute. This exercise assists in developing a normalized model and can also indicate where data concepts are not fully completed. Users can allow for reuse, allowing for the duplication of a data item concept on more than one entity as an entity attribute, either as a copy (two data items with the same name but completely divergent definitions) or as a reused data item (one data item participating as an attribute equally to more than one entity, with one common name and one common definition). The choice of which method to follow largely depends on the definition of the corporate dictionary itself – is a "name" a "name," whether it is a customer name or a company name, or are all data items uniquely identified by their business name and, as such, will not have a redundancy possibility? Whatever choice is made, SAP Sybase PowerDesigner enforces consistent practice.

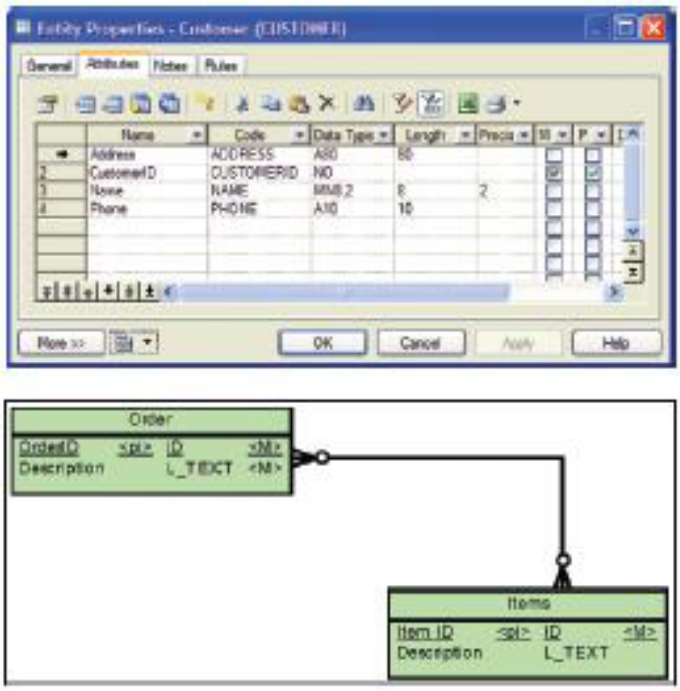
ENTITY-TO-ENTITY RELATIONSHIPS

The CDM allows for easier definition of relationships between entities, supporting one-to-one, many-to-one, and many-to-many relationships as well as supertype/subtype relationships using a number of industry standard notations, including IDEF 1/x, IE, Merise, and Barker's notation (see Figure 4).

A data dictionary tool must also provide for the following best practices:

- Archive obsolete concepts based on the changing business
- Allow for data concept expansion (more attributes, more relationships, versioned)
- Represent data construct in normalized models
- Support governance and standards enforcement

Figure 4: Definition of Relationships Between Entities



Archive Obsolete Concepts

In SAP Sybase PowerDesigner, there are several ways to support the concept of obsolete data concepts. The full traceability of SAP Sybase PowerDesigner allows for identifying and preserving the history of the "obsolete concepts." When encountered again, the description of the obsolete concept can quickly be uncovered and then a business decision is made about how to proceed.

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Allow for Data Concept Expansion
The enterprise repository allows for versioning of all model objects at the object level and for comparison between any two versions of models and objects within them. As the concept expands, new details can be saved in a new version of the object, keeping the older versions around in case there are version-specific dependencies on the implementation side to keep track of. When a specific set of models needs to be used together in a specific version of the data dictionary model or models, the use of the repository configuration feature helps ensure proper version matching. By selecting a specific document or version for each document to be used together, SAP Sybase PowerDesigner can be used to help ensure strict pairing between dictionary and project when version "lock-in" or history is needed.

Represent Data Construct in Normalized Models
The CDM allows for easier normalization, independent of logical and physical details. SAP Sybase PowerDesigner is designed to view the conceptual data model as a level of abstraction above the storage paradigm and the implementation platform. The conceptual data model is not a relational model (does not have migrated foreign keys, allows for unresolved many-to-many relationships) and can therefore be normalized in a way that is consistent with the pure data in concept, not in implementation. In other words, all entity attributes of a given entity are there because they are functionally dependent on the entity identifier and are not used in any way in any other entity. Foreign keys are artificial. For example, an "order" concept should not have a "customer identifier" attribute, as this attribute is not really functionally dependent on the "order identifier" itself, but is a construct inserted to implement the relationship (that is, a place to store the data that defines the implementation of this relationship concept within a relational database) and can confuse the analyst looking at "order" for its pure data definition.

Support Governance and Standards Enforcement
SAP Sybase PowerDesigner provides a series of techniques to extend the built-in modeling and metadata governance rules in a way that is seamless to the user. Using these techniques, SAP Sybase PowerDesigner can be used to extend the check model to include custom governance rules, helping to ensure not just good dictionary development and maintenance, but that it is standardized along your own set of criteria. Using events, you can also help ensure, in real time, that inaccurate or inconsistent metadata is caught at design time instead of waiting for a report to reveal the gap. Using the passive or active enforcement is a matter of choice – whether it is better to force the user to take steps to correct gaps and mistakes up front or to allow for a freer thinking workflow, and then have the model checker assist in cleaning up the work after the fact.

FOR MORE INFORMATION

To learn more about how SAP Sybase PowerDesigner can help your business, call your local SAP or Sybase representative or visit us online at www.sap.com/powerdesigner.

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