PPDM Association

Information and Product Management

PPDM 3.8 Reference Guide

Last updated for PPDM 3.8

Developed for the PPDM Association by
Trudy Curtis (PPDM CIO)
Alvin Dixon (Excalibur-Gemini)
Members of the PPDM Association

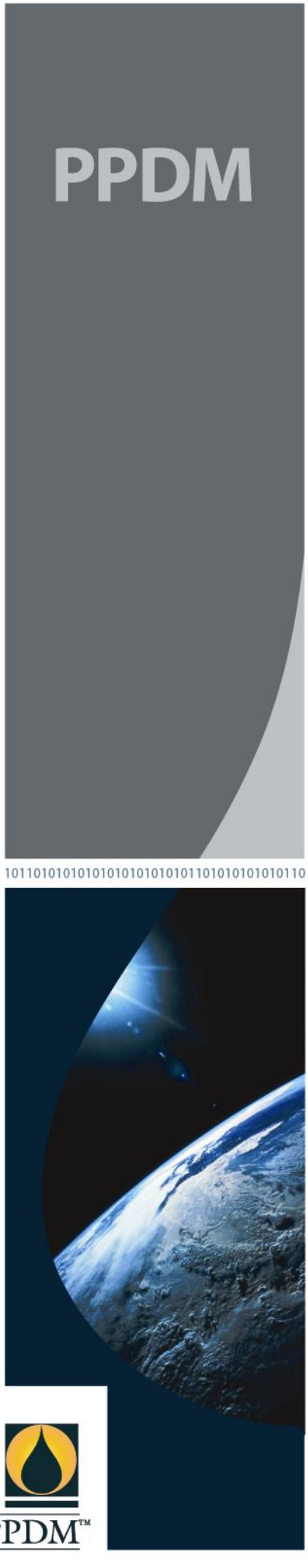

Table of Contents

About This Document

This reference guide has been prepared to help managers, analysts, database administrators, programmers, data managers, and users understand how to use the Records Management Module (usually referenced as the ***Information and Product Management Module***) in PPDM 3.8. Readers at many levels, from managerial to technical implementers will benefit from reading various sections of this document. General, high-level business information is contained at the beginning of the document, with each section becoming progressively more technical and detailed.

Sometimes the terms we use in this and other PPDM documents need to be defined. We provide definitions in a separate Glossary, which you can obtain from PPDM.

This reference guide contains the following sections:

- Introduction

  Provides an executive overview of the Digital information and product management business. Many professionals in the business refer to this as Records and Information Management (RIM).

- Business Process Overview

  Provides a more detailed view of key issues addressed by RIM specialists and how the model is designed to address and support business practices.

- Integration

  Discusses the integration of Digital information and product management with the other PPDM Business Modules and provides information about related references guides.

- Model Overview

  Discusses the use of digital information and product management tables in the Data Model.

- Tables and Columns

  Identifies the data model tables for the digital information and product management module, how they should be used, what they contain, and recommends how they should be used. This section should be used in conjunction with the PPDM Table Report available for download from the PPDM Web Site (www.ppdm.org).

- Implementation Considerations

Discusses issues related to implementing the PPDM model, architectural methodologies used in design, or special considerations for implementation that are not related to a specific table.

- Frequently Asked Questions

  Addresses technical and business questions about the digital information and product management module.

- Appendix A – Sample Queries

  Provides example queries with the appropriate SQL scripts that illustrate uses of the model based on the Business Requirements Document.

- Appendix B – Changes to the Model

  Identifies the changes in the digital information and product management module from the latest version to the newest release version of the PPDM model.

Introduction

Throughout history, all organizations regardless of their size, public or private, share one thing in common. They all receive and create information. Next to their employees, information has long been regarded as the most important asset or resource within an organization.

Today, more and more organizations are seeing the value and critical nature of this vital asset. Most successful organizations have developed and implemented comprehensive Records and Information Management (RIM) programs within their corporation and included it as part of their business operations framework.

The main purpose behind RIM programs is to ensure records and information assets are retained to meet all administrative and operational requirements of an organization. In addition, RIM programs ensure compliance to governing legislation.

A comprehensive RIM program addresses three (3) primary objectives:

1. Provide quick and accurate access to products and information.
2. Provide efficiencies to process and handle products and information.
3. Provide economies to manage and store products and information.

More recent RIM strategies strive to integrate records information with structured data and GIS or spatial information systems. Thorough integration of these data types allows users to seamlessly navigate between structured and unstructured information through a GIS or map based browser. PPDM provides a solid framework for this integration.

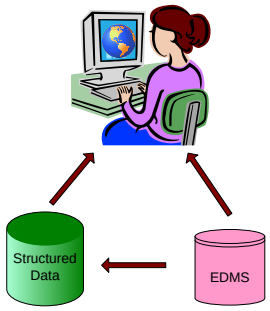

Figure: Many users prefer to access all of their data from a single interface, often GIS based. Users may not have knowledge about which system or format data is in. These are less important selection criteria than business information such as a well name or location.

Information represents knowledge and organizations utilize this knowledge on a daily basis in performing activities, solving problems and making critical decisions affecting business operations.

RIM can be defined as the systematic control and management of products and recorded information either created or received by an organization during the normal course of business. Products and recorded information come in a variety of mediums and carry various characteristics and attributes.

RIM programs provide control over the receipt, creation, maintenance, retention, storage, retrieval, preservation (including information migration) and final disposition of all recorded information.

The PPDM Information And Product Management Module supports management of many different types of material including:

1. Traditional media, such as paper documents, maps and files.
2. Digital media, such as tapes and CD-ROM.
3. Calibrated image files, such as well logs or core photos.
4. Physical products, such as drilling cuttings, lithologic samples and fossils.
5. Equipment, such as hand-held computing devices, microscopes or vehicles.

Business Process Overview

Purpose

The Information and Product Management Module provides a means of describing and managing information about information and products. Information and products are created throughout the life cycle of a project, from acquisition through disposition. Typically, information products with long term value are considered to be a corporate asset and are treated as such using appropriate Records Management techniques.

Every day, every (productive) employee of every company creates and uses products or information. Managing these assets in an age where creating information is easier than ever has become extremely important. Each day, you must discern between useful assets and dross, properly identify the rights you have to incoming products and information (so you don't claim what you don't own) and understand and plan for the uses that each product or piece of information might be put to.

This is not a simple undertaking; anyone who is considering working in this domain should obtain properly trained experts. Internationally, professional bodies such as the ARMA Association provide expertise, certification and education in this area. The business issues described in this section have been

articulated by Industry; through their incorporation into the design of PPDM 3.8, the PPDM Association has ensured that the PPDM model supports Industry requirements for an effective and complete Information and Product Management Module.

Clarifying Some Terms

Knowledge, Information and Data

Much media attention has been focused on the concepts of knowledge, information and data. "Knowledge Management" has become a buzzword used by Service and Software providers to describe their services. Any dictionary can provide you with definitions for each of these terms – you can find some good ones here (http://www.merriam-webster.com/).

Unfortunately, finding a meaningful way to apply these terms to your every day business practices is not as simple as looking up a definition. These three concepts can be described as a continuum in which the distinction between each category is blurred. Let's use part of the life cycle of seismic as an illustration of this problem.

When seismic sets are first acquired through field acquisition, raw trace data is gathered. This, presumably, is data. However, the acquisition manager reviews the traces to determine the effectiveness of the recording programme; if necessary modifications are made to improve the data quality. For this function the raw traces are information that produces knowledge that helps the acquisition manager do his job better.

During processing, the raw traces are treated as data by the processor; the output from each step is information that guides the implementation of additional processing steps, yet the output of each step is data input to the next. Final processing products are used as input data into an interpretation package from which picks are made. Are the picks data, information or knowledge? We could go on endlessly, but the point is that each product is treated as data, information or knowledge by a user based on how they use it.

The terms data, information and knowledge are process driven terms; they are not product driven terms. What is most important to each manager is whether that product adds value to the organization; this determines how it should be managed.

Structured and Unstructured Data

Digital data storage and management practices have traditionally focused on structured formats such as databases. These formats are designed to support query and retrieval; as a result, use of databases as the underlying data store for software applications is commonplace. Unfortunately, structured data is in the

minority in many businesses today. This is particularly true in the Energy Industry.

Today's technology has enabled industry to generate unprecedented numbers of documents that are created as digital files. Often, these documents contain analysis, recommendations, evaluations and findings that capture the knowledge asset of a corporation. Most of these documents exist in unstructured forms, such as spreadsheets, Word processing formats or text files; this data is generally referred to as unstructured data.

Finding information in unstructured documents can be imprecise, time consuming and difficult. Nevertheless, it is important to manage these products, as they contain substantial portions of a corporation's knowledge asset. New knowledge based search engines are being developed that will help users organize, collate and search these unstructured products for relevant information. You can learn more about search engines here (http://www.searchenginewatch.com/).

Key Business Processes

Acquisition

Virtually every aspect of the Energy business is highly data and information intensive; vast amounts of information are created or retrieved at each phase of the life cycle of a well, lease or seismic set. Often business success depends on corporate ability to quickly and accurately retrieve information when it is needed. The late 1990's and the 2000's have been labeled "the Information Age". All too often, however, the reality is simply Information Proliferation.

In PPDM, it is important to ensure that each piece of data or information and each product are associated with the business objects that they are related to. Each well file or core sample should be connected to the well it belongs to, each contract to all the wells, seismic or partnerships it affects and so on. In today's energy business, records and information that are disassociated from the business objects that own them provide limited value to the organization and present a threat to true integration and growth.

Any product that may be required for legal purposes must be associated with a chain of custody so that you can prove its provenance. In some cases, it is necessary to provide and manage a certified true copy of a critical document. In each case, appropriate management must be enforced to ensure that these products are protected and legally admissible when they are needed.

Information Vs Rendering

The fundamental difference between the information that describes and identifies an item and the way that it has been rendered is one of the most critical concepts in effective information and product management today. This difference drives

many corporate policies; properly managed it can enhance your ability to manage a RIM store effectively, but problems can make your system error prone and difficult to use.

Let's use a seismic section as an example. Processed seismic trace data is created in a technical processing application and output in a variety of formats. Digital copies may be stored on tape, CD ROM or disk. Physical copies may be output to film, fiche, microfilm or paper. Regardless of how the output has been rendered, the essential information content is identical. Knowledge about which physical renderings are simply copies of the same information is essential to effective RIM practices.

The PPDM data model accommodates this partitioning of concepts to support good management practices. Detail that describes a product, regardless of the media on which it is stored, is stored as an Information Item. Details about the various physical manifestations or renderings of that information are stored as Physical Items.

Each Information Item is associated with all the business objects in PPDM that are relevant to it; details about the business object are stored in the business module for that object, and are not replicated in the RM module. Only details about the information that specifically describe the information from a management perspective are stored in the RM module. This prevents needless replication of data and greatly reduces the risk of data input errors during the cataloguing process. Processes can be established that allow domain experts to manage and maintain this information.

The managers of an archive manage physical renderings; the archive may be digital or physical. It is the physical renderings of a product that are circulated, copied, maintained and managed through the life cycle.

Information Management

As our use of computers for data gathering and analysis increases, the timeliness and accessibility of the products or data we may be looking for has become increasingly important. Paper or film products are time consuming and expensive to handle, so many organizations are adopting policies to obtain or create digital copies of as much data and information as possible. Scanning, optical character recognition (OCR) and other imaging technologies have become widespread.

Distributed computing environments have created their own set of benefits and risks. Analysts can generate thousands of documents, spreadsheets and interpretations each year; of these, some contain useful information that should be considered a corporate asset. Most of these products, however, are simply working documents, drafts and temporary files. The first problem facing the RIM specialist is to determine which product is an asset and which is not and should be discarded; the second is to gather and protect data that has value.

Digital File Storage

Relational databases provide users with capability to store large objects directly in the database. PPDM 3.8 takes advantage of this capability by allowing digital files to be stored in the RM module. This means that digital documents, such as MS Word files or spreadsheets and images, can be stored in your PPDM 3.8 database.

Tremendous benefits can be realized through this strategy. For example, documents stored in an Oracle database are not subject to problems with changing file names or directory structures; this is a problem that plagues data storage, most file servers or local disk drives (such as the user's "C" drive).

Security controls for accessibility and entitlements can be administered using your database; this functionality is generally far superior to the security on a file server. The PPDM Entitlements module can be used to enhance security control by tracking exactly who is entitled to read, copy, change or delete these digital records.

Product Management

The PPDM model keeps track of all products and their various renderings. In addition, it tracks maintenance schedules and records, retention schedules, duplication and tape copy records. PPDM 3.8 will allow you to keep track of every product you ever generate, but this is unlikely to support the needs of a user community. Records management policies, procedures and practices must take into account which renderings or copies should be kept. Strategies for dealing with version control, old media destruction and sign-out of original media must support the long and short-term needs of an organization.

Tape copy processes are not an exact science; parity errors or other problems with original media can create copies that are not exact replicas of their parents. In some cases, errors can be corrected but sometimes the error is permanent. In these cases, the RM module allows you to track the errors encountered and what you did to attempt repairs.

Lithologic (rock) samples, core cuttings, drilling mud samples and other physical products are part of an effective product management strategy. As with information, these products must be associated with the business objects that own them; without this integration you have nothing more than a bucket of rock or mud. Furthermore, each product must be associated with any relevant technical analysis that was conducted; this provides important information for replicating and enhancing the results of scientific analysis.

Equipment management is rapidly gaining importance; not only must you know where each piece of equipment is and who is using it, but you must know which piece of equipment was used to gather which data. Calibration information for technical instruments can provide critical insights into data gathered with them,

and details about the conditions under which each instrument was used can affect data analysis.

Encoding and Encryption

Nearly all the digital data that is a long-term asset is encoded in some way. Records management specialists need to consider how encoding will affect their policies and practices. For example, if documents are stored in MS Word format, you must consider which version of MS Word is used and whether an appropriate viewer / editor will be available for that format at the end of the document's life span. Open viewers for formats based on open technology are generally preferred over digital files that are stored in proprietary formats; remember, for example, that documents created in early versions of MS Word cannot be viewed in current versions of MS Word.

Some products have been technically encoded in many ways. Seismic trace data may be encoded in RODE format and then tarred. A text document will likely use ASCII characters – but which character set is used? In order to properly identify the encoding applied to data, you must consider how the data was encoded, the order in which each layer was applied and you must have a method of decoding each layer. The PPDM module can be used to track all of this information.

Circulation and Distribution

Setting up a good mechanism for receiving, cataloguing and storing all of your products and information is only half the battle. Ultimately, each product must be made available to users; this is, after all, the reason why records management exists. Think about what could happen if you give the only copy of a critical document to a user who loses or damages it. What is the liability or cost to the corporation?

Balancing the needs of the user against corporate requirements may require some delicate maneuvering, but it can be done. Most organizations provide copies to their users when they are needed and ensure that the original (or certified true copy) is retained in a protected environment. Others ensure that only properly authorized and trained personnel handle the product. Either way, you need to know who has each product, when they got it and when it is expected back again.

The condition of certain products is important; this can serve as a trigger to maintenance or copying processes and can provide important insight into the effectiveness of your practices.

Version control is also critical; when a product is checked back into the archive, is it exactly the same as when it arrived, or has it been modified? Facility drawings, for example, are often redlined when they are taken into the field. Documents may be edited before they are returned to an digital archive. PPDM 3.8 allows you to keep track of this important information in support of your policies and practices.

Meta Data

Meta data is, simply, data about data. This term has been so loosely defined in many organizations that it's impossible to arrive at a consensus about what meta data is. Several organizations have worked to define sets of meta data that can be used internationally for many kinds of data.

The Dublin Core (www.dublincore.org) has defined a small set of meta data attributes for records management.

The Federal Geographic Data Committee (FGDC, at http://www.fgdc.gov/) is an interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis.

The ISO Metadata group ISO/TC 211 (Geographic information/Geomatics) works towards standardization in the field of digital geographic information. http://www.isotc211.org/

The PPDM data model has been expanded to cover elements of the meta data standards that have been identified as most critical to our industry. The model will allow other metadata types to be managed if needed, albeit in a more generic form.

Transactions, Agreements and Partnerships

Mergers, buy-outs, acquisition, farmin agreements and partnerships are commonplace today. Each has a similar consequence for the product and information manager; products and information are going to be moved around, copied or distributed. Naturally, the better your database, the simpler these processes will be.

PPDM version 3.8 allows users to keep track of the transactions that they have been party to; each transaction can be associated with the physical items that were affected by it. Each partnership can be associated with the business objects and the physical items that are relevant to it. Contracts can be associated in the same way.

Model Overview

Integration

Integration is the key to managing the digital information and product management module and its components properly. While information about a physical is stored in the RM Module, Meta data about the technical contents of the product is normally stored in the appropriate business module and referenced through foreign key relationships. Information critical to managing digital information and products throughout their life cycle is managed in many support

Tables and Columns

The following tables exist in the Information And Product Management Module (RM Module) of PPDM version 3.8. Each table is described in the following section; you can jump to a table description by clicking on the hyperlinked table name below. Note that for detailed content descriptions for each table, you should refer to the PPDM version 3.8 table documentation.

Information Items

In PPDM 3.8, the information that is contained in an digital or physical record or that describes the record is understood to be distinct from the physical rendering of the product. The information content of each product is captured through the super type table INFORMATION_ITEM and its sub-types. The physical rendering of the information is described in the table PHYSICAL_ITEM. This important distinction

allows an information item to be rendered in multiple physical forms, as in cases where:

- An original paper copy has been scanned or microfilmed. In this case, there is an original rendering and a duplicated rendering on other media.
- The information is too voluminous to be housed on a single physical rendering product, such as a magnetic tape. In this case, the information content is stored across multiple physical items.
- One physical rendering product (such as a CDROM) is able to store more than one set of information. In this case, many information items can be stored on one physical media item.

Typically, someone with business expertise in the information or product that is managed handles the content in INFORMATION_ITEM; details about managing each PHYSICAL_ITEM are often handled by Records Management specialists.

RM_INFORMATION_ITEM

The super type table RM_INFORMATION_ITEM and its sub-types handle details about each information item. The master table RM_INFORMATION_ITEM allows you to categorize and subcategorize each item. You can track the quality of the information itself (for example, whether the quality is final, draft, published, etc.); note that this is not the same as the quality or condition of the rendering, as that information is contained in the RM_PHYSICAL_ITEM table.

Information that identifies and describes an information item, often called *Meta Data* by records managers, (such as a seismic line number and shot point range) is stored in the relevant business module. Direct connections to each PPDM business module are created through foreign key relationships between the information item and the appropriate business object in PPDM. Several important data management requirements are supported as a result:

- Ensure that Meta data about information items is not replicated between business and records management systems, reducing the possibility of data synchronization errors.
- Allow each information item to be associated with one or many business objects, such as a report that relates to several wells.
- Allow applications built on this model to provide separate security access to business information and records management information, so that only authorized personnel can modify the database.

Many corporations have existing file or reference numbers attached to each product that has been catalogued or indexed; this number may be captured in the column REFERENCE_NUM. A title assigned to the information item can also be captured.

Users may wish to associate an information item with a geographic region; this is supported through a bounding box in latitude and longitude. The bounding box has been spatially enabled for use with a GIS engine, so that spatial searches can be facilitated. In many cases, bounding box information will be derived from the locations of the business objects related to a product; in this case it is preferable to derive and maintain the bounding box information through scripts or triggers; otherwise, you run a risk of the data being out of synch with the business data. A NUMERIC_ID is added to improve search times for spatial engines; of you use this column, ensure that it is consistently used so that you obtain maximum benefits.

The super type INFORMATION_ITEM contains a two part primary key, INFORMATION_ITEM_ID and INFO_ITEM_TYPE. While INFORMATION_ITEM_ID may be any value, INFO_ITEM_TYPE must be equal to the name of one of the valid subtype tables.

In INFORMATION_ITEM, the value of INFO_ITEM_TYPE must equal one of:

- RM_COMPOSITE
- RM_MAP
- RM_DOCUMENT
- RM_LITH_SAMPLE
- RM_SEIS_TRACE
- RM_EQUIPMENT

Each of the 6 valid subtypes has been projected as a physical table in PPDM version 3.8; all have the same Primary Key structure as the super type table. However, each of the subtype tables must use its own name in the column INFO_ITEM_TYPE; this requirement is enforced through a check constraint.

Back to the list of table names

RM_COMPOSITE

A composite item is one that has been constructed from a variety of types. For example, a poster display that has a map, a cross section and a seismic section on it would be classified as a composite item. At this time, very little detail about composite items has been defined; future work groups will enhance this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_COMPOSITE, the value of INFO_ITEM_TYPE must equal "RM_COMPOSITE".

Back to the list of table names

RM_DOCUMENT

A document may be a digital file or a paper document; the contents of the document may be formalized, as in a well report, or handwritten, as in a field document. At this time, little detail about documents has been defined; future work groups will enhance

this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_DOCUMENT, the value of INFO_ITEM_TYPE must equal "RM_DOCUMENT".

Back to the list of table names

RM_EQUIPMENT

Equipment has been added as a subtype to allow small equipment that is managed through a check-in and out process to be handled with PPDM. In this way, you can track exactly which equipment is used on a project, or to survey a seismic line, etc. Catalogue information for each piece of equipment can be stored for physical management. This connection will allow details about instrument calibrations, maintenance or service calls to be associated with the technical products of that equipment.

At this time, very little detail about equipment has been defined; future work groups will enhance this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_ EQUIPMENT, the value of INFO_ITEM_TYPE must equal "RM_ EQUIPMENT".

Back to the list of table names

RM_FOSSIL

Fossils can be stored as "type" fossils, casts of fossils, slides or holders containing one or more fossils, photographs of fossils etc. Capture information about which fossils are included through the RM_INFO_ITEM_CONTENT tables.

Detailed information about a fossil, including its taxonomic classification and morphology can be described in the fossil module.

In RM_ FOSSIL, the value of INFO_ITEM_TYPE must equal "RM_ FOSSIL".

Back to the list of table names

RM_LITH_SAMPLE

Lithologic samples have been created as a valid subtype so that core samples, drilling cuttings or fluids and other earth materials can be managed in PPDM. Functionally, this will allow you to track the storage, maintenance and circulation of these samples and to associate each sample explicitly with any technical analysis done to the sample. Chain of custody can be tracked, enabling these products to be admitted as evidence in court.

At this time, very little detail about composite items has been defined; future work groups will enhance this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_ LITH_SAMPLE, the value of INFO_ITEM_TYPE must equal "RM_ LITH_SAMPLE".

Back to the list of table names

RM_MAP

A map is a geographic representation of spatial information, whether captured on paper, as a digital image or as a spatial layer file for use in a spatial engine. At this time, very little detail about maps has been defined; future work groups will enhance this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_ MAP, the value of INFO_ITEM_TYPE must equal "RM_ MAP".

Back to the list of table names

RM_SEIS_TRACE

Seismic traces may be unprocessed (as the raw field data acquired during recording) or processed (to various levels, from pre-stack to post-stack). Basic information that describes each set of trace data has been accommodated in this table and its subordinates, RM_TRACE_HEADER and RM_AUX_CHANNEL. Using these tables, you can capture horizontal and vertical scales, polarity, reference datum, replacement velocities, record lengths and more. Additional details about these items can be captured in the table RM_INFO_ITEM_DESC as desired. Some members feel that the attribute information in this table is more properly defined in the RM_PHYSICAL_ITEM segment of this module; this is a subject for future discussions.

In RM_ SEIS_TRACE, the value of INFO_ITEM_TYPE must equal "RM_ SEIS_TRACE".

Back to the list of table names

RM_SPATIAL_DATASET

This sub type is used to define information items that are spatial datasets, such as hydrography, culture, well data, soil data etc that may be obtained for corporate use. Usually this data is subject to periodic updates, and is described by a set of metadata. The metadata elements have been mapped from FGDC into PPDM, to facilitate loading of this data.

Back to the list of table names

RM_WELL_LOG

This sub type allows well logs or curves to be described. Logs may be digital, analogue, raster, paper, film etc. The format or rendering does not matter in this table. For each entry, track the display interval and scale. Other information about the log or curve is stored elsewhere in the RM module or in the WELL_LOG module.

At this time, very little detail about equipment has been defined; future work groups will enhance this. Details about these items can be captured in the table RM_INFO_ITEM_DESC as desired.

In RM_ EQUIPMENT, the value of INFO_ITEM_TYPE must equal "RM_ EQUIPMENT".

Back to the list of table names

Information Item Management

RM_INFO_ITEM_ALIAS

Use this table to capture any names, codes or identifiers that have been assigned to an information item. In some cases, this could be a URI assigned to a document by an electronic document management system, or it could be a file number assigned by a records management group. A URI could be semantically considered a name or a location (or both), so it may also be appropriate to use RM_PHYS_ITEM_STORE to capture this information in its context as a location.

It's possible to use this table to help integrate many systems. Often, it won't be possible to make all aliases be unique amongst all the systems being integrated by this table, so information about the source or application is very important.

Back to the list of table names

RM_INFO_ITEM_BA

Use this table to capture relationships with all business associates EXCEPT authors and creators (these should be captured in RM CREATOR). The most common type of business associate in this table would be a contact, such as a contact to obtain permission to view a document, or a contact from whom to obtain an updated version of the information.

Back to the list of table names

RM_INFO_ITEM_GROUP

Use this table to group information items into logical sets, such as all the documents and files in a Well File, or all the documents related to a project or legal proceeding.

You can use this table to group elements that are separate objects that are part of a distinct entity.

In cases where the order of the item is important you can use the column GROUP SEQ NO to order the items.

Back to the list of table names

RM_INFO_ITEM_MAINT

This table is most commonly used to track update schedules for information items that are updated on a periodic basis through a subscription. Spatial layers, such as culture files, are a good example. Physical maintenance, such as tape rewinding schedules or cleanings, should be tracked in RM PHYS ITEM MAINT.

Back to the list of table names

RM_INFO_ITEM_STATUS

During their life type, the content of information items may be subject to review, verification, update, challenges and so on. Use this table to capture information about the status of the information from various points of view. The status is divided into two components STATUS TYPE (the point of view such as creation, legal, audit etc) and the STATUS (approved, in progress and so on).

Back to the list of table names

RM_CREATOR

While documents are generally considered to have been created by an author, other types of products may be created through sample collection or other processes; the general term *creator* is intended to bind all methods of information or product creation.

More than one level of creatorship may be tracked. Depending on your needs, you can track the company that handled the work and / or the individual(s) who performed the actual work. Different types of creatorship may be recognized through use of the CREATOR_TYPE column.

Back to the list of table names

RM_FILE_CONTENT

Digital file storage has posed problems for records managers for many years. Files archived on a local server pose a management problem if they can be moved, deleted or renamed. Tracking document versions can be problematic in an uncontrolled environment. Placing digital files directly in a database can solve this dilemma by allowing the security measures in the PPDM Entitlements module and database system security to handle these issues.

RM_FILE_CONTENT allows you to store the digital contents of an digital file together with the name of the application needed to view or edit the file. Note that various database application systems have implemented the SQL3 BLOB / CLOB functions differently; this table may require some customization to provide optimal performance.

Back to the list of table names

RM_INFO_ITEM_CONTENT

This table provides associations between information items and the business objects that they are related to. Each information item may be related to as many business objects as necessary; each relationship should occupy one row in the table. It is not desirable to contain multiple links in a single row of data, as this may cause ambiguity with some of the foreign key relationships.

Back to the list of table names

RM_INFO_ITEM_DESC

Any type of description for an information item can be managed in this table by defining the type of characteristic in DESCRIPTION_TYPE and the description itself as either a DESCRIPTION (for text descriptions) or a VALUE (for numeric descriptions). Use this table to capture details about sub types of RM_INFORMATION_ITEM that have not been fully modeled yet or to capture information that is important to your organization.

Back to the list of table names

RM_INFO_ITEM_GEOMETRY

This table provides the bounding box in RM_INFORMATION_ITEM with spatially enabled functionality.

Back to the list of table names

RM_INFO_ITEM_ORIGIN

The origin of information can be defined in this table. For example, a set of processed mapping coordinates may be derived from raw survey data or a final report derived from a draft document. In order to use this table, both information items must be created as rows in the RM_INFORMATION_ITEM table. The process used for conversion, the date of the conversion and the identification of the processor are supported.

Back to the list of table names

Metadata Management

RM_INFO_COORD_QUALITY

Use this table to capture details about the quality of location information in a record, document or data file. Most often used for spatial datasets that a company subscribes to, but can also be used for other information. You can use this table to describe the horizontal and vertical accuracy of the data, indicate the presence of deficiencies in the data, details about how the coordinate information was acquired and its completeness.

Back to the list of table names

RM_INFO_DATA_QUALITY

Use this table to capture details about the quality of the data or information in a record or document, excluding coordinate quality (please use RM INFO COORD QUALITY for that). You can use this table to describe the completeness of the data, the accuracy of the attributes in the data (has it been properly identified and described internally) and any deficiencies that have been noted

Back to the list of table names

RM_KEYWORD

Keywords are used to describe records, and can be used to make searching for data easier and more effective. Keywords may be derived from an original document or an authorized thesaurus. Reported keywords and keywords obtained from thesauri can be stored seperately in this table, so that you can associate a REPORTED KEYWORD with a THESAURUS WORD if you have the capability.

Back to the list of table names

RM_THESAURUS

A thesaurus, in this context, is a set of words or descriptors about a particular subject area. Often, they have a cross-reference system for use in the organization of a collection of documents for reference and retrieval (from Merriam Webster Online).

Back to the list of table names

RM_THESAURUS_GLOSSARY

For each term in a thesaurus, there may be one or more definitions. Each definition may be stored in this table with appropriate bibliographic information to reference to source of the definition.

Back to the list of table names

RM_THESAURUS_WORD

This table contains a set of the terms or words used in a thesaurus. Each word may be subject to one or more glossary definitions.

Back to the list of table names

RM_THESAURUS_WORD_XREF

Use this table to create relationships between words in a thesaurus, to identify terms that are similar or identical in semantic meaning, hierarchies among terms, or replacement of terms.

Back to the list of table names

Seismic Information Management

RM_AUX_CHANNEL

This table is used only for unprocessed seismic trace data; it is used to list the channels on which the auxiliary data, such as uphole time, time break and file number, are captured.

Back to the list of table names

RM_TRACE_HEADER

This table may be used to store the header from processed data explicitly. Define the general type of trace header (such as SEG Y or SEG A) in the column HEADER_FORMAT. The HEADER_WORD and WORD_LENGTH columns describe each of the header words that are on the header; the DESCRIPTION column is used to capture the contents of the header word itself.

If preferred, you do not need to break the header into defined words, but can simply use the DESCRIPTION column to capture the entire header row.

Back to the list of table names

Associate Physical and Information Items

RM_DATA_CONTENT

This table provides the association between information items and their physical renderings. Modeled as a many to many breakout table, RM_DATA_CONTENT supports the following cases:

- A one to one correspondence between the information item and its physical rendering. In this case, each information item is captured on exactly one physical rendering. In normal records management practices, this is an unlikely to occur, as information assets are often redundantly stored on backup media.

- An information item may be stored in many renderings. In this case, there is normally an original (that may be protected in case it is needed as evidence in court) and copies of the original. Note that the "original" is not necessarily the first copy of a document; a contract original may be the signed copy, rather than the digital document. Copies may be created on a variety of media, such as scanned images, paper copies, microfilm, photographs, CDROM, tape etc.

- The content of an information item may span more than one physical media item. For example, a large seismic set may be stored over several magnetic tapes, with a recognized segment of the set on each tape. In marine recordings, the set may be represented as specific channels (channel 1-120 on tape A and channels 121 – 240 on tape B). For large lines, the set may be represented as segments (shots 1-30 on tape A and shots 31-50 on tape B).

- One physical item, such as a tape or CD ROM, may hold the contents of several information items. This scenario is increasingly common as the storage capacity of digital media grows. In this case, you can store the location that a particular information item begins on the media.

Back to the list of table names

Physical Items

In PPDM 3.8, the information that is contained in a digital or physical record or that describes the record is understood to be distinct from the physical rendering of the product. The information content of each product is captured in the super type table INFORMATION_ITEM and its sub-types. The physical rendering of the information is described in the table PHYSICAL_ITEM.

RM_PHYSICAL_ITEM

A physical item is generally understood to be an item that can be managed and manipulated as a single business object. Good examples of physical items include tapes, CD ROM, file folders and digital files.

Decide what comprises a physical item based on your business practices. For example, suppose you store documents in file folders and the folders are placed in a box that is kept on a shelf in a warehouse. When a user asks for a file folder, your practice is to sign the entire box out to the user. In that case, the box is the physical

item; the contents of each file folder can be enumerated using RM_DATA_CONTENT.

Descriptive information related to several business practices is managed by this table; please refer to the table documentation for a complete list of columns and their descriptions. The following list summarizes a few of the most useful features in the table:

- Records management details
    - CATALOGUE_DATE and CATALOGUE_NAME: describe who indexed the data and when it was done.
    - Retention period
    - CERTIFIED_TRUE_COPY_IND: a flag that can be set indicating that a chain of custody has been established to identify this as a true copy of an original. Use RM_CUSTODY to track the chain of custody.
- Digital file characteristics, such as
    - DIGITAL_DENSITY, DIGITAL_FORMAT, DIGITAL_SIZE
    - The number of digital files included (such as a set of tiff or pdf images)
    - Color format or bit density
    - Image resolution
- Physical characteristics, such as
    - Length, width, height, weight
    - Type of media, such as paper, film, bucket etc.
    - Condition of the product
- Data distribution details
    - CIRCULATION_ALLOWED_IND: whether this physical copy may be circulated. Original documents are often held in a secure environment in case they are needed for legal reasons. Confidential documents may be restricted; the Entitlements module can be used to clarify who has various types of access.
    - CIRCULATION_OUT_IND: can be set procedurally when a physical copy has been checked out to a user.
    - SALE_ALOWED_IND: can be set to indicate whether a specific product can be sold or traded.
- A foreign key from RM_DATA_STORE has been placed in this table to support the relatively rare case where you only want to capture the current location of an item. Please check the comments associated with RM_PHYS_ITEM_STORE to see reasons why you may not wish to do this. If you use this method, you should not use the other method as well, unless you are managing synchronization between both via procedures or triggers.

Back to the list of table names

RM_PHYS_ITEM_GROUP

Groups of items that comprise a physical entity can be described in this table. A group may be a set of images that make up a set, or a group of files that make up a document.

In cases where the order is important, ORDER_SEQ_NO may be used to sort the objects as needed.

Back to the list of table names

Physical Item Management

RM_COPY_RECORD

Usually used for tape copy records. When copying from one tape to another, use this table to track the relationship between records on the original to records on the copy.

Back to the list of table names

RM_CUSTODY

Records managers must often be able to demonstrate and prove the provenance of a document, lithologic sample or other product. In this case, use RM_CUSTODY to document organizations or people who had custody of a physical product over time. The location of signed receipts, such as letter registrations or courier receipts, at each handover can be captured. Note that if you require provenance, the actual receipts may be required as evidence (a record in this table will probably not be sufficient for legal purposes).

Back to the list of table names

RM_DECRYPT_KEY

Files that have been digitally encrypted may be decrypted using this key. Note that storing decryption keys in your database may pose a security risk; the table should be managed by a qualified expert to ensure that the keys are not accessible to unauthorized people.

Back to the list of table names

RM_ENCODING

Digital documents are nearly always encoded. Essentially, the only documents that are not meaningfully encoded are pure text documents (and even they are subject to a set of ASCII encoding, but this does not generally affect users). Documents created

and stored in MS WORD format are encoded in the MS WORD format; this format is not readable by other applications unless they have an appropriate decoder.

Digital files may be subject to many levels of encoding before they are stored. For example, an MS WORD document may be stored in ZIP format and then TARRED by a Unix file server for storage.

In order to make a digital file accessible for viewing or manipulation, you must track all the levels of encoding applied to the data and the order in which the encoding was committed. In our example, a text file has been encoded in MS WORD (MS OFFICE 2000), then ZIPPED (WINZIP 8.0) and then TARRED (ULTRIX). At each level of encoding, track the application name and version that is necessary to decode the data.

Records managers should note that data with long storage periods might be encoded in ways that may not be decodable in future years. For example, documents created in early versions of MS WORD cannot be opened by current versions of that application. Technical data is often encoded using a variety of technical specifications, such as the RODE format for seismic data. The complexity of managing technical data is exacerbated when it is created in technical applications that use proprietary data formats.

Spreadsheets are particularly problematic in records management stores, as the data they contain may have been subjected to macros or algorithms that are embedded in the spreadsheet. In some cases, stored spreadsheet data may have been subjected to a calculation or derivation that is external to the spreadsheet, making the document almost useless for any practical purpose.

Store documents and data in formats that are public or open whenever possible, keeping in mind the long-term accessibility of the data. Data or information that is created by technical applications and stored in a proprietary format may be extracted to an open or standard format before archival. In some cases, it may be valuable to archive a copy of the application, to ensure that it is available for future use.

Back to the list of table names

RM_PHYS_ITEM_CONDITION

The condition of a physical item, condition errors that are encountered during access or copy operations and relevant correction methods are stored in this table. In many cases, this table will be used by tape copy organizations to track problems encountered by tape copy operations. However, it can also be used to track the general condition of an item before and after it is checked out to a user – this can help identify users who damage items and flag items that need to be repaired or replaced.

Back to the list of table names

RM_PHYS_ITEM_MAINT

Scheduled maintenance operations, such as tape rewinds, can be tracked in this table. Some organization may choose to document the date that a physical item was destroyed – in this case, the database record may be retained as evidence that the destruction was scheduled.

Back to the list of table names

RM_PHYS_ITEM_ORIGIN

Product origins are tracked in this table. For example, a scanned image is a copy of an original document and a tape copy is made of an original tape. While the copy must be stored as a physical item in the database, it is not strictly necessary that the parent be in the database. In some cases, a copy may be made of an original that is owned by another organization – in this case, you may choose to only track the method used for the copy and the date it was made.

Back to the list of table names

Digital Images

Image files, such as well log image files are managed in the PPDM database. Details about the construction of the raster log and its contents are managed in the well log module. Details about the physical rendering of the raster log (tiff image etc) are managed in the Records Management module.

RM_IMAGE_SECT

Each image, such as a well log image file can be deconstructed into logical sections, such as a header, one or more upper and lower scales, log data at various scales or well diagrams. This table lists the sections that the image is composed of. Details about the depth of the section, the length and interval of the scale for the section, the matrix type observed, calibration details etc are all managed here. Use only the columns that are useful for each type of section that you are managing.

The RM IMAGE COMP table will be used to group the sections into logical groups. You can facilitate this grouping in one of two ways:

- Store only atomic component sections in this table.
  - Upper scale
  - Lower scale
  - Log section
- Store atomic component sections in this table and add rows for each of the logical groupings you will create. This is the preferred method.
  - Upper scale

- Lower scale
- Log section
- Scale group

Back to the list of table names

RM_IMAGE_COMP

Use this table to group sections in the image into logical groups. For example, an upper scale, a lower scale and a log section may be grouped together. The order in which components are to be placed for use can be stored in COMPOSITE SEQ NO.

- If you are storing atomic components only, group as follows
  - Log section with the Upper Scale
  - Log Section with the Lower Scale
- If you are also capturing the logical grouping as a section, group as follows:
  - Scale group with the Upper Scale
  - Scale Group with the Lower Scale
  - Scale Group with the log section

Back to the list of table names

RM_IMAGE_LOC

This table captures location information for each section on the image. Some companies store only the pixel row in which a section starts and ends. Other companies store pixel row and column (X and Y) information.

You may also use this table to capture details about the depth corrections for log sections. In this case, capture the LOG DEPTH in conjunction with the X and Y positions on the image. Use the column POSITION TYPE to differentiate between positions that locate the section on the image and positions used for depth calibration.

Back to the list of table names

Physical Locations

RM_DATA_STORE

This table can be used to keep track of locations where digital information or physical products are temporarily or permanently stored. The hierarchical structure of these locations can be captured through the recursive relationship within the table. The number of levels in the hierarchy may be known (or preset) or variable (can change over time). For example:

- Warehouse A contains 3 storage bays
    - Bay 1 contains 150 tape racks (numbered 1-150)
        - Each tape rack has 10 tape shelves
            - Each shelf contains 50 tape slots
    - Bay 2 contains 20 filing shelf units
        - Each unit has 5 shelves
            - Each shelf can hold 8 labeled boxes
    - Bay 3 contains 25 shelf units
        - Each unit has 7 shelves
            - Each shelf can store 500 files
- File server B contains a file structure with variable numbers of folders
    - Each directory folder has a name
        - Each file is stored somewhere in the directory structure

Back to the list of table names

RM_PHYS_ITEM_STORE

A physical item that has been placed in storage must have an identifiable location (if it doesn't you might reconsider the value of that item).

- Sometimes the location for each item is set and remains the same over its lifetime.

- Some records management systems are designed so that each product that is re-shelved after use goes into the next available slot.

- Others are set up so that an item (such as a tape) has more than one assigned storage location; usually one location is used for long term storage and a second is used when the item is brought on-site for use.

- For some kinds of data, it may be necessary to track all the locations an item has been, in case it is later identified as an environmental or health hazard. In this case, you will have to go back to every place that item has ever been stored for cleanup purposes.

RM_PHYS_ITEM_STORE is designed to support all of these requirements and should be the preferred table for implementations; however, the design team recognized that not all facilities require the flexibility provided by this table. Two denormalized locations are provided:

- RM_PHYSICAL_ITEM: Use this location when each item will be stored in one and only one location and the history of where an item was stored in the past is not needed. If you use this column, you should either not use RM_PHYS_ITEM_STORE at all, or you should populate the

RM_PHYSICAL_ITEM FK through a trigger or stored procedure from RM_PHYS_ITEM_STORE.

- RM_DATA_CONTENT: Use this location when you are enumerating the contents of a physical item and need to indicate a sub-location within that item. For example, you can use the FK to indicate the file number in a box, or the record number on a tape, or the row number in a database.

Back to the list of table names

RM_DATA_STORE_HIER

This table and its child RM DATA STORE HIER LEVEL, store the theoretical hierarchy description that exists in a data storage facility. Use this pair of tables to ensure that each data store that is assigned is located correctly in a hierarchy. For example, if a data store contains bays, which contain shelving units care should be taken to ensure that this hierarchy is properly used each time a new data store is created.

This table does not contain actual hierarchies, but the theoretical structure that should be followed when designing an actual hierarchy (these are in the table RM DATA STORE)

Back to the list of table names

RM_DATA_STORE_HIER_LEVEL

This table stores the theoretical hierarchy itself, as simple parent – child relationships. The PK column HIER LEVEL ID can be assigned a surrogate value if you wish; its function is to provide uniqueness for each object in the hierarchy.

LEVEL SEQ NO stores the order of the level, with 1 being at the top (highest) level of the hierarchy and increasing as you go down it. More than one kind of data store can exist at a specified level of the hierarchy, provided that objects at the same level don't try to "contain" each other.

For example, a warehouse at level 1 can contain both storage blocks and bays, as long as they are separate parts of the hierarchy. Levels can be assigned names, if you need to. Each level can have a different type of data store (bay, shelving unit etc).

Back to the list of table names

RM_DATA_STORE_ITEM

For a data store, this table can be used to indicate what kinds of items can or should be stored in it. For example, some types of data stores are designed for seismic data, well files, fossils samples etc.

You can also use this table to capture a summary of how many "slots" or "spaces" are available in the store for this kind of data and how many of them have been used as of a specified date. This can help with resource allocation and planning for use of a data store facility.

Back to the list of table names

RM_DATA_STORE_MEDIA

For a data store, this table can be used to indicate what kinds of media can or should be stored in it. For example, some types of data stores are designed for cores, tapes, rolled sections etc.

You can also use this table to capture a summary of how many "slots" or "spaces" are available in the store for this kind of media and how many of them have been used as of a specified date. This can help with resource allocation and planning for use of a data store facility.

Back to the list of table names

RM_DATA_STORE_STRUCTURE

Use this table to describe the physical structure of your data stores. For example, you can describe the dimensions (height, length, weight capacity, width) of the data store. You can define the dimensions of a single data store object or a range of objects, as you require. You can also use the table to capture some summary metrics about how many slots are in the series and how many of them have been used at a given date.

You may use this table to define groups of data stores that have similar or related functions. The tables RM DATA STORE MEDIA and RM DATA STORE ITEM further refine this summary information.

Back to the list of table names

Circulation Management

RM_CIRCULATION

This table captures the general process of signing a product out through formalized or informal processes. Since each type of product will require different business rules, your policies and practices should determine how this process occurs. For example:

- Is each product physically removed from the storage location (such as some equipment) or is a copy made (likely for digital files)?

- When the product is returned is it considered to be the same product or a new version of the original? If you are tracking versions of a document, a new information item is created, and RM_INFO_ITEM_ORIGIN is used to track the relationship between versions.

This module can be used to track:

- The date in and out for the circulation
- Reservation information
- Condition of the item when it went out and when it was returned. A variety of events, including maintenance, repair or disaster damage can cause the CONDITION_IN not to correspond to the CONDITION_OUT for the following circulation event.
- Reference numbers to provide links to existing systems
- Since a circulation event may occur as a step in a project, a FK from PROJECT_STEP is provided. This allows circulation events that are a component of completing work orders to be incorporated.

Back to the list of table names

RM_CIRC_PROCESS

This very generalized table can be used to track specific elements of a circulation process from the perspective of the records manager. Processes may include pulling a product, shipping it, receiving it and re-shelving it. If you wish, the same steps can be captured as a PROJECT, with considerably more detail.

Back to the list of table names

Implementation Considerations

Constraints in PPDM

It is essential that anyone who is considering using PPDM version 3.8 review the Constraints Reference Guide first. Improper use or population of constrained columns in PPDM can compromise the quality of your data and the reliability of your queries. This document may be obtained from the PPDM Association or downloaded from the PPDM web site at www.ppdm.org.

Check Constraints

PPDM Version 3.8 makes use of check constraints in rare cases where the values that may be input for a column are known at design time and will not change over time. Two types of uses are observed in PPDM 3.8.

- Where the column name is %_IND, the column is an indicator field, and the values may only be Y, N, or null.
- Super-sub type implementations use check constraints to enforce the integrity of the super-sub type relationship. Currently these relationships are in use for Seismic, Business Associates, Records Management, Support Facilities, Production Entities and Land Rights.

  Let's use the Records Management Module as an example. This structure consists of a parent table (RM_INFORMATION_ITEM) and several sub-type tables (RM_DOCUMENT, RM_FOSSIL, RM_EQUIPMENT, RM_SEIS_TRACE, RM_MAP etc). Each of the tables has a two-part primary key: INFORMATION_ITEM_ID and INFO_ITEM_TYPE.

  INFORMATION_ITEM _ID is assigned by the user and can have any value as long as it is unique for that type of seismic set INFO_ITEM _TYPE was designed to maintain the integrity of the super-sub type structure and can only have the values assigned to it by check constraints; these values are the table names of the valid sub-types. In RM_INFORMATION_ITEM or any table with a foreign key from RM_INFORMATION_ITEM, the INFO_ITEM _TYPE can be assigned any of the allowed table names, but in each of the sub-types, it can only have the name of the table it is owned by.

Currencies in PPDM

Costs in PPDM may originate in any valid Unit of Measure (UOM), such as USD, $CDN, YEN, etc. However, to ensure that queries for retrieval and reporting are efficient, it is desirable to convert all original currencies to a standard unit of measure for storage in the database. PPDM supports the requirement to restore the original value in the following way:

- Convert all stored currencies to a single currency type, such as US dollars.

- CURRENCY_OUOM stores the currency in which the funds were initially received. When the stored currency is multiplied by the CURRENCY_CONVERSION, the value of the transaction in the original currency is obtained.

- CURRENCY_CONVERSION stores the rate applied to convert the currency to its original monetary UOM from the stored UOM. This value is valid for this row in this table at the time of conversion only. When this value is multiplied by the stored currency value, the original value of the transaction in the original currency is restored.

Units of Measure

Relational databases, powerful as they are, are not good at certain types of query and retrieval. Any query that requires the database to retrieve all the rows in a large table and perform some calculations on the data before returning results to a user is likely to perform very poorly. This assumes, of course, that the person constructing the query is aware that a calculation is necessary when writing the query. Data management strategies for such tables recommend that requirements for on-line conversions such as this be eliminated if at all possible. The PPDM strategy for handling units of measure falls into this category.

Every column in the data model that references a Unit of Measure (such as a depth, temperature, length etc.) should be stored using a single, common unit of measure. For example, in one PPDM instance, all the total well depths should be stores as meters or as feet. Storing some depths as meters and the rest as feet creates problems for the data base and adds confusion to the user (who may not be aware that the numbers in the depth column are not all meters).

The original unit of measure (the unit in which the data was originally received) can be stored in the data table. For example, the WELL table captures FINAL_TD and FINAL_TD_OUOM. These columns capture the value of the final total depth of the well and the units that the depth was originally captured in.

The ***stored unit of measure*** is captured in the PPDM meta model, PPDM_COLUMN. This table captures the default unit of measure for a column and the name of the column where the original unit of measure is stored. The following illustration provides an example:

WELL

UWI	DRILL_TD	DRILL_TD_OUOM
SMITH12F	1250	FEET
JONES44	1560	METERS
12345	1400	FEET

PPDM_COLUMN

TABLE_ NAME	COLUMN_ NAME	UOM_ COLUMN	OUOM_ COLUMN	DEFAULT _ OUM_ SYMBOL
WELL	UWI			
WELL	DRILL_TD		DRILL_TD_OUOM	M
WELL	DRILL_TD_OUOM			
WELL_CEMENT	CEMENT_AMOUNT	CEMENT_AMOUNT_UOM	CEMENT_AMOUNT_OUOM	

Figure 2: *The method for storing and tracking units of measure is illustrated here.*

Note that in the example, the Drilling TD is stored in meters, but was originally received as feet.

In some cases, it is not possible to ensure that all the rows in a column are stored as a single unit of measure – this is common in cases where the unit of measure is dependent on some other factor. For example, substance measurements may depend on the substance being measured; gases are stored as MCF, liquids as BBL etc. In these cases, the unit of measure is stored directly in the business table.

PPDM GUID

The Global Unique Identifier (GUID) has been added to every table in PPDM. Applications that are designed to take advantage of this column should implement the DDL set PPDM37.GUID. This procedure will alter the PPDM_GUID column to be NOT NULL and to add a Unique Index to each column.

Audit Columns

Each table contains five columns: SOURCE, ROW_CHANGED_BY, ROW_CHANGED_DATE, ROW_CREATED_BY, and ROW_CHANGED_DATE. These columns satisfy a data-auditing requirement to identify the user and date of database transactions.

Use the “CREATED” columns when you are inserting new data rows and the “CHANGED” columns when you are updating a data row. The ROW_CHANGED /

CREATED_BY columns are usually populated using the system login id in use. ROW_CHANGED / CREATED_DATE is usually set to the system date of the insert or update operation.

To populate the SOURCE column, specify where you obtained the data. If you receive the data from Vendor A, and Vendor A received the data from Regulatory B, you should set the SOURCE to Vendor A. In some cases (such as for interpreted picks), data is created by an application. In this case, the source may be set to identify the application that created the data.

Identifying Rows Of Data That Are Active

Maintaining information about how a business object has changed over time is an important business requirement for all these modules. To support this, mechanisms for allowing versioning have been added to many tables.

Every table in PPDM version 3.8 contains a column called ACTIVE_IND. The values for this column may be one of Y, N, or null. When more than one row of data (such as a spatial description or a status) has been created for a business object, use the ACTIVE_IND to indicate which row is currently active (note that in some cases, more than one row may be active simultaneously).

This provides implementers with two benefits. First, when populating EFFECTIVE_DATE and EXPIRY_DATE it will not be necessary to populate EXPIRY_DATE with a false future date to indicate that the row of data has not expired yet. Second, queries can explicitly search only for rows that are active.

If this column is used for queries, as recommended (such as “find me the currently active status for this land right”), you should implement procedures to ensure that this column is always populated as either Y or N and maintained appropriately. If the column is left blank (NULL), the query will not be consistent or reliable.

For example, you could default the value to N if the expiry date is filled in and has already happened. Make it Y if the expiry date is empty *or* if the expiry date contains a future date.

Modifying PPDM 3.8

Subsetting PPDM

The PPDM data model is designed to allow users to implement portions that support their business without needing to manage modules that are not required. Good data management practices are also supported; this means that data redundancy is reduced in the Model whenever possible.

All information about Seismic will be found in the seismic module; information about contracts is stored in the Contracts module, details about objects that are

retained for long term use are stored in the Records Management module and so on. Depending on your business requirements, you can implement all or some of the modules.

PPDM version 3.8 is released with a dataset that is populated with information grouping tables into modules (PPDM_TABLE_GROUP). You can use this information to create a subset DDL if you wish.

In general, it is usually simplest to install the entire PPDM data model and simply restrict usage to the portions that are useful to you. Additional tables can be implemented as your business requirements expand, or as your data and processes are able to support capture in a data model. Architectural guidelines for subsetting PPDM are contained in the PPDM Architectural Principles Document. This document can be obtained from the PPDM Association or downloaded from the PPDM web site at www.ppdm.org.

Expanding PPDM

As a consequence of the PPDM Design process, which actively solicits and incorporates business requirements from Industry, many users find that the model is quite complete. However, individual implementations may find that additional columns are needed, or that some denormalization will help their performance.

The Association provides documentation about how to expand the data model to accommodate your specific requirements. This document can be obtained from the PPDM Association or downloaded from the PPDM web site at www.ppdm.org. Tables or columns that have been added should be so marked in PPDM_TABLE.EXTENSION_IND, PPDM_COLUMN.EXTENSION_IND or PPDM_CONSTRAINT.EXTENSION_IND.

Feedback to PPDM

Much of the growth of the PPDM model can be attributed to Industry feedback. All implementers are requested and encouraged to provide feedback to the Association about changes they have made for implementation. Feedback can be submitted to changes@ppdm.org.

Frequently Asked Questions (FAQ)

Data Owners

How do I know who the owner of this data is?

Define an "ownership" interest set in the INTEREST SET module of PPDM 3.8. Once you have created this interest set, you can associate it with various information items in the INT_SET_COMPONENT table. Owners are listed, with their relative interests, in the INT_SET_PARTNER table.

My partners have changed for this AMI (Area of Mutual Interest); so different people need access to the data. How do I track this change?

If you had created an interest set for the original interest set (using the I***nterest Set*** module), you will start by setting that interest set as inactive and expired. Change the EXPIRY_DATE to the date that the old interest set expired, and the ACTIVE_IND to 'N'.

Now, create a new interest set. You have a choice here, depending on what you mean by the change. If the partner interest levels have changed, you may simply want to create a new version of the same interest set (use the INTEREST_SET_SEQ_NO for this option). If this is a completely new interest set, create a new INTEREST_SET_ID and populate it. You can associate the old and the new interest sets using the INT_SET_XREF table if you need to.

Each interest set can be associated with the business objects it pertains to (such as a seismic line, well, land right etc.). You can also associate the interest set with specific products if you wish.

Information Management

I would like to store my digital log curve data in PPDM. How do I do that?

Information describing the well log is captured in the Well module, using the WELL_LOG_% tables. These tables describe the log type, how it was created, who created the log and when the job was done. For more details, refer to the Well Log Reference Guide, provided on the PPDM web site (www.ppdm.org).

Within the RM and Well log modules, you have three options available to track the digital logs.

1. The Well Log module will allow you to store the actual well log digits in the table WELL_LOG_CURVE_VALUE.

2. You can track the location of physical or digital products external to the database. The Well log is the information item, and its physical renderings are physical items. Track the location of each physical item by using RM_PHYS_ITEM_STORE.

3. You can store the file containing actual log digits or a raster image in the database. Store the digits in the table RM_FILE_CONTENT. Details about the images are tracked in RM_IMAGE and it's related tables.

I would like to store my files in PPDM and allow users to launch the appropriate viewer for the file from my application. Can the database track what viewer to use?

For simple cases, the data itself and the name of the application to be used is stored in RM_FILE_CONTENT. This is intended to provide a short cut for very simple data storage requirements.

In more complicated cases, renderings of that product may be encapsulated in more than one layer (click here for more detail). To properly manage these products (whether the file is then stored in the database or externally), you must track the levels of encoding and the order in which each was applied. To open the file, you must apply the appropriate decoder at each level. The encoding applied to each physical item, and the order in which the encoding was applied, is stored in RM_ENCODING. If an application is used to decode that level, the name of the application is stored in RM_ENCODING. If a decryption key is needed, the key is stored in RM_DECRYPT_KEY.

Additional notes: when managing digital information for future access, keep in mind the availability and longevity of the product needed to open the file. Ensure that an appropriate viewer will be available until the end of the scheduled retention period for that product. It's usually simplest to convert all digital data to a few standardized formats for retention.

Product Management

I would like to develop a program to notify me when tapes are scheduled for cleaning. How do I keep track of the maintenance cycle for my tapes?

RM_PHYS_ITEM_MAINT is used to keep track of maintenance details. You can schedule events to occur later and keep track of when each event actually occurred and who performed the task.

Additional notes: Maintenance tasks for all products should include scheduled destruction dates, so they are not kept beyond their useful life span. The scheduled retention period for each physical item is tracked in RM_PHYSICAL_ITEM.RETENTION_PERIOD.

I run a data warehouse and either send original products to my users or make copies for them when requested. How do I keep track of this work?

Work orders are often created to track the authorization to circulate or copy products. Use the Work Order module to track these requests. The Project module can be used to track scheduling and completion of tasks associated with the work order. You will note that the table RM_CIRCULATION contains a foreign key from PROJECT_STEP; this allows you to track the actual extraction of products to the project details.

Each physical item can be signed out, either by physically removing the product from storage or by creating a copy and sending the copy to the requestor. Your business practices will govern the actual processes you use. If you physically remove the item, you can track the movement of the product using the RM_CIRCULATION and RM_CIRC_PROCESS tables. Once the item is pulled, it may be simply copied and reshelved, or it may be sent to the requestor. The RM_CIRCULATION and RM_CIRC_PROCESS tables support both practices.

Tape Copying

I want to create a tape index sheet that cross-references the file numbers on the original tape to the file numbers on the new tape.

Use RM_COPY_RECORD for this purpose. You will note that both the original and the new tapes must be catalogues in your database. If you simply want to track the fact that Tape A was created through a tape copy process, use RM_PHYS_ITEM_ORIGIN.

I want to track the errors encountered during a tape copy operation and what I did to correct the errors.

The tape copy operation is tracked in RM_PHYS_ITEM_ORIGIN. Errors encountered with that operation, together with appropriate corrective measures, are tracked in RM_PHYS_ITEM_CONDITION.

Entitlements

How can I keep track of who is authorized to access this data, and what level of authorization they have?

This information is managed in the Entitlements module of PPDM 3.8. In summary, you can use this module to create user groups. Each user group is granted a specific level of access to various objects in PPDM. These objects may include Information Items, Seismic sets, wells, land rights and so on.

For more details, refer to the Entitlements Reference Guide.

Appendix A: Sample Queries

These sample queries have been developed using a subset of the requirements defined in the Business Requirements Document. Note that there are many ways to address the questions posed here, but we have tried to provide useful examples that illustrate the use of the data model. The PPDM Association does not provide any guarantee that these queries will satisfy your business requirements; they are for illustration only.

- **Spatial or GIS queries:** Spatial queries are not thoroughly addressed in this section of the reference guide; how you deal with these queries depends on the spatial engine you are using. In many cases, we have avoided using spatial queries because the number of query lines needed obscures the rest of the query and makes it more difficult to read. Sometimes, we have provided a connection to a NAMED AREA, rather than a lat/long box.

- **Versioning over time:** Many aspects of the oil and gas business have a strong time component. Users require information about how a business object was configured in the past, what it looks like now, and what it is expected to look like in the future (i.e., if a project is not active now, when was it in the past). If your queries need to address the situation as it is now, use the ACTIVE_IND you will find in many versioned tables. Using this flag helps ensure that you do not return data that is out of date.

- **Units of Measure:** Several examples have been provided to show how units of measure should be queried in PPDM. As these queries are nearly always handled the same way, this guide does not show the method every time it is needed; the authors felt that this would create confusion and obscure the main intent of the query.

Partners and Owners

Who are my partners in the products related to the SMITH MILLS seismic acquisition survey and what is their net working interest in the data?

```
Select      ISP.PARTNER_BA_ID, ISP.NET_PERCENT_INTEREST
  from      INT_SET_PARTNER ISP, INTEREST_SET INS,
            INT_SET_COMPONENT ISC
 where      ISC.SEIS_SET_ID = 'SMITH MILLS'
   And      ISC.SEIS_SET_TYPE = 'SEIS_ACQTN_SURVEY'
   And      ISC.INTEREST_SET_ID = INS.INTEREST_SET_ID
   And      ISC.INTEREST_SET_SEQ_NO = INS.INTEREST_SET_SEQ_NO
   And      ISP.INTEREST_SET_ID = INS.INTEREST_SET_ID
   And      ISP.INTEREST_SET_SEQ_NO = INS.INTEREST_SET_SEQ_NO
   And      INS.INTEREST_SET_TYPE = 'DATA'
```

Records Management

What is the file location for tape XYZ?

```
Select      RPIS.STORE_ID
  From      RM_PHYSICAL_ITEM RPI, RM_PHYS_ITEM_STORE RPIS
 Where      RPI.PHYSICAL_ITEM_ID = 'XYZ'
   And      RPI.PHYSICAL_ITEM_ID = RPIS.PHYSICAL_ITEM_ID
   And      PREFERRED_LOCATION_IND = 'Y'
```

Has the data on tape ABC been encrypted? If so, what is the decryption method or key?

```
Select      PHYSICAL_ITEM_ID, ENCODING_SEQ_NO, ENCODING_TYPE,
            APPLICATION_NAME, ENCODING_VERSION, DECRYPT_KEY_ID
  From      RM_ENCODING RE
 Where      PHYSICAL_ITEM_ID = 'ABC'
```

Were any errors encountered during the copy of tape ABC? How were these errors resolved?

```
Select      RPIO.PHYSICAL_ITEM_ID, RPIO.ORIGIN_SEQ_NO,
            RPIO.PHYSICAL_PROCESS, RPIC.CONDITION_ID,
            RPIC.CONDITION_TYPE, RPIC.ERROR_COUNT,
            RPIC.CORRECTION_METHOD
  From      RM_PHYS_ITEM_ORIGIN RPIO, RM_PHYS_ITEM_CONDITION RPIC
 Where      RPIO.PARENT_PHYSICAL_ITEM_ID = 'ABC'
   And      RPIO.PHYSICAL_ITEM_ID = RPIC.PHYSICAL_ITEM_ID
   And      RPIO.ORIGIN_SEQ_NO = RPIC.ORIGIN_SEQ_NO
```

Has tape ABC been checked out by anyone since 2001?

```
Select      CIRC_ID, CHECKED_OUT_BY, CIRC_OUT_DATE, CIRC_IN_DATE,
            DATA_CIRC_STATUS
  From      RM_CIRCULATION RC
 Where      RC.PHYSICAL_ITEM_ID = 'ABC'
   And      CIRC_OUT_DATE >=  'JAN-01-2001'
```

A digital file has been stored in the FILE CONTENT table. What application do I use to open that file?

```
Select      FILE_ID, APPLICATION_NAME
  From      RM_FILE_CONTENT
 Where      FILE_CONTENT IS NOT NULL
```

I must find a certified true copy of a legal document, and provide its chain of custody as evidence in a legal case.

```
select      RII.INFORMATION_ITEM_ID, RII.INFO_ITEM_TYPE,
            RPI.PHYSICAL_ITEM_ID, RC.SEND_BY, RC.SEND_DATE,
            RC.RECEIVE_BY, RC.RECEIVE_DATE, RC.SEND_METHOD,
            RC.REGISTRATION_NUM
  from      RM_CUSTODY RC , RM_INFORMATION_ITEM RII,
            RM_PHYSICAL_ITEM RPI, RM_DATA_CONTENT RDC
 where      RII.INFORMATION_ITEM_ID = 'MY CONTRACT'
   and      RII.INFO_ITEM_TYPE = 'RM_DOCUMENT'
   and      RII.TITLE = 'The Contract I Need'
   and      RII.INFORMATION_ITEM_ID = RDC.INFORMATION_ITEM_ID
   and      RII.INFO_ITEM_TYPE = RDC.INFO_ITEM_TYPE
   and      RDC.PHYSICAL_ITEM_ID = RPI.PHYSICAL_ITEM_ID
   and      RPI.CERTIFIED_TRUE_COPY_IND = 'Y'
   and      RPI.PHYSICAL_ITEM_ID = RC.PHYSICAL_ITEM_ID
```

Note that I have not located the physical copy of the receipt. If you need that, you can find it by matching the registration number to another information item.

Seismic Records Management

When was the Pangman project acquired?

```
select      SAS.START_DATE, SAS.COMPLETED_DATE
  from      SEIS_ACQTN_SURVEY SAS
 where      SAS.ACQTN_SURVEY_NAME = 'PANGMAN'
```

List the basic acquisition design for surveys in the database.

```
select      SS.SEIS_SET_ID, SS.SEIS_SET_TYPE, SS.FIRST_NLINE_NO,
            SS.FIRST_SEIS_POINT_ID,  SS.LAST_NLINE_NO,
            SS.LAST_SEIS_POINT_ID, SS.PREFERRED_NAME, SS.COUNTRY,
            SS.START_DATE, SS.END_DATE, SAD.ACQTN_DIMENSION,
            SAD.ACQTN_SHOTPT_INTERVAL, SAD.ACQTN_SHOT_LINE_SPACING,
            SAD.CDP_COVERAGE, SAD.ENERGY_TYPE, SAD.ENVIRONMENT,
            SAD.SHOT_BY, SAD.SHOT_FOR, SRS.GROUP_SPACING
  from      SEIS_SET SS, SEIS_ACQTN_DESIGN SAD, SEIS_RECVR_SETUP SRS
 where      SAD.ACQTN_DESIGN_ID(+) = SS.ACQTN_DESIGN_ID
   and      SAD.ACQTN_DESIGN_ID = SRS.ACQTN_DESIGN_ID(+)
order by    SS.SEIS_SET_ID, SS.SEIS_SET_TYPE, SAD.ACQTN_DESIGN_ID
```

What energy source was used to record seismic line AAA?

```
Select      SAD.ENERGY_TYPE
  From      SEIS_SET SS, SEIS_ACQTN_DESIGN SAD
 Where      SS.SEIS_SET_ID = 'AAA'
   And      SS.SEIS_SET_TYPE = 'SEIS_LINE'
   And      SS.ACQTN_DESIGN_ID = SAD.ACQTN_DESIGN_ID
```

What field data was created when recording line AAA?

```
Select      RMII.INFORMATION_ITEM_ID,  RMII.INFO_ITEM_TYPE,
            RMII.ITEM_CATEGORY, RMII.ITEM_SUB_CATEGORY
 From       RM_INFORMATION_ITEM RMII, RM_INFO_ITEM_CONTENT RIIC
Where       RIIC.SEIS_SET_ID = 'AAA'
   And      RIIC.SEIS_SET_TYPE = 'SEIS_LINE'
   and      RIIC.INFORMATION_ITEM_ID = RMII.INFORMATION_ITEM_ID
   and      RIIC.INFO_ITEM_TYPE = RMII.INFO_ITEM_TYPE
   and      RMII.ITEM_CATEGORY = 'FIELD DATA'
```

List the shots for seismic line AAA together with the time delay, uphole time, tape and file number for each record.

```
Select      SR.TAPE_NUMBER, SR.FIELD_FILE_NUMBER,
            SR.TIME_DELAY, PC.DEFAULT_UOM_SYMBOL,
            SR.UPHOLE_TIME, PC1.DEFAULT_UOM_SYMBOL
  from      SEIS_RECORD SR, PPDM_COLUMN PC, PPDM_COLUMN PC1
 where      SR.SEIS_SET_ID = 'AAA'
   and      SR.SEIS_SET_TYPE = 'SEIS_LINE'
   and      PC.TABLE_NAME = 'SEIS_RECORD'
   and      PC.COLUMN_NAME = 'TIME_DELAY'
   and      PC1.TABLE_NAME = 'SEIS_RECORD'
   and      PC1.COLUMN_NAME = 'UPHOLE_TIME'
```

List which auxiliary channels were used to record the uphole time, time break and file number on this tape.

```
select      RAC.CHANNEL_TYPE, RAC.CHANNEL_NUM
  from      RM_AUX_CHANNEL RAC, RM_INFORMATION_ITEM RII
 where      RII.INFORMATION_ITEM_ID = 'AAA'
   and      RII.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
   and      RII.INFORMATION_ITEM_ID = RAC.INFORMATION_ITEM_ID
   and      RII.INFO_ITEM_TYPE = RAC.INFO_ITEM_TYPE
```

Note that in this case, it is not strictly necessary to join RM_SEIS_TRACE. I have, however, identified the tape more casually than you may for your implementation.

Show the SEG Y header created on processed tape 'PAA'.

```
select      RTH.HEADER_FORMAT, RTH.HEADER_WORD, RTH.DESCRIPTION
  from      RM_TRACE_HEADER RTH, RM_INFORMATION_ITEM RII
 where      RII.INFORMATION_ITEM_ID = 'PAA'
   and      RII.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
   and      RII.ITEM_CATEGORY = 'SEG Y'
   and      RII.INFORMATION_ITEM_ID = RTH.INFORMATION_ITEM_ID
   and      RII.INFO_ITEM_TYPE = RTH.INFO_ITEM_TYPE
```

I've been casual about identifying the ITEM_CATEGORY values – you need to set these values yourself. This part of the query is simply making sure you have identified the correct tape.

Who was the processing contractor for this seismic section?

```
Select      SPS.PROCESSING_COMPANY
  From      RM_INFORMATION_ITEM RMII, RM_INFO_ITEM_CONTENT RIC,
            SEIS_PROC_SET SPS
 Where      RIC.SEIS_SET_ID = SPS.SEIS_PROC_SET_ID
   And      RIC.SEIS_SET_TYPE = SPS.SEIS_SET_TYPE
   And      RMII.INFORMATION_ITEM_ID = '12345'
   And      RMII.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
   And      RMII.INFORMATION_ITEM_ID = RIC.INFORMATION_ITEM_ID
   And      RMII.INFO_ITEM_TYPE = RIC.INFO_ITEM_TYPE
```

What products were used as input to this interpretation project?

```
Select      SIC.INFORMATION_ITEM_ID, SIC.INFO_ITEM_TYPE,
            SIC.PROC_SET_ID, SIC.PROC_SET_TYPE ,
            SIC.PROC_COMPONENT_ID, SIC.UWI
  From      SEIS_INTERP_COMP SIC, SEIS_INTERP_SET SIS, SEIS_ALIAS SA
 Where      SA.SEIS_SET_ALIAS = 'JONES HALL'
   And      SA.SEIS_SET_TYPE = 'SEIS_INTERP_SET'
   And      SA.SEIS_SET_ID = SIS.INTERP_SET_ID
   And      SIS.INTERP_SET_ID = SIC.INTERP_SET_ID
   And      SIC.INPUT_IND = 'Y'
```

What seismic trace products do I have on record for line AAA?

```
Select      RII.ITEM_CATEGORY, RII.ITEM_SUB_CATEGORY,
            RST.HORIZONTAL_SCALE, RST.VERTICAL_SCALE,
            RST.SAMPLE_RATE, RST.POLARITY, RST.PHASE
  From      RM_SEIS_TRACE RST, RM_INFO_ITEM_CONTENT RIIC,
            RM_INFORMATION_ITEM RII
 Where      RIIC.SEIS_SET_ID = 'AAA'
   And      RIIC.SEIS_SET_TYPE = 'SEIS_LINE'
   And      RIIC.INFORMATION_ITEM_ID = RII.INFORMATION_ITEM_ID
   And      RIIC.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
```

```
   And      RII.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
   And      RST.INFORMATION_ITEM_ID = RIIC.INFORMATION_ITEM_ID
   And      RST.INFO_ITEM_TYPE  = 'RM_SEIS_TRACE'
```

Projects

What steps have been completed during this project, who completed them and when?

```
select      PS.STEP_TYPE, PS.ACTUAL_START_DATE, PS.ACTUAL_END_DATE,
            PSB.BUSINESS_ASSOCIATE
  From      PROJECT P, PROJECT_STEP PS, PROJECT_STEP_BA PSB
 Where      P.PROJECT_NAME = 'JONES RIVER'
   And      P.PROJECT_ID = PS.PROJECT_ID
   And      PS.PROJECT_ID = PSB.PROJECT_ID
   And      PS.STEP_ID = PSB.STEP_ID
   And      PS.STATUS = 'COMPLETE'
```

What are the due dates for this project?

```
Select      STEP_TYPE, DUE_DATE, CRITICAL_DATE
  From      PROJECT_STEP PS
 Where      PROJECT_ID = '123456'
```

Entitlements

What entitlement does Unicorn Oil I have to the seismic trace products related to seismic line ABC?

```
Select      E.ENTITLEMENT_ID, E.DESCRIPTION, EG.ACCESS_TYPE,
            EG.RESTRICTION_DESC
  From      ENTITLEMENT E,  ENT_COMPONENT EC,
            RM_INFORMATION_ITEM RII,
            RM_INFO_ITEM_CONTENT RIIC, ENT_GROUP EG,
            ENT_SECURITY_GROUP ESG, ENT_SECURITY_BA ESB
 Where      RIIC.SEIS_SET_ID = 'ABC'
   And      RIIC.SEIS_SET_TYPE = 'SEIS_LINE'
   And      RIIC.INFO_ITEM_TYPE = 'RM_SEIS_TRACE'
   And      RIIC.INFORMATION_ITEM_ID = EC.INFORMATION_ITEM_ID
   And      RIIC.INFO_ITEM_TYPE = EC.INFO_ITEM_TYPE
   And      EC.ENTITLEMENT_ID = E.ENTITLEMENT_ID
   And      E.ACTIVE_IND = 'Y'
   And      E.ENTITLEMENT_ID = EG.ENTITLEMENT_ID
   And      EG.SECURITY_GROUP_ID = ESG.SECURITY_GROUP_ID
   And      ESG.SECURITY_GROUP_ID = ESB.SECURITY_GROUP_ID
   And      ESB.BUSINESS_ASSOCIATE = 'UNICORN OIL'
```

What must I do when my entitlement expires?

```
Select      E.ENTITLEMENT_ID, E.DESCRIPTION, E.EXPIRY_ACTION,
            E.EXPIRY_DATE
  From      ENTITLEMENT E
 Where      E.ENTITLEMENT_ID = 'GHIJK'
```

Work Orders

Who requested this work order?

```
Select      REQUESTOR_BA
  From      WORK_ORDER
 Where      WORK_ORDER_ID = '12345432'
```

Who am I billing for the work done?

```
Select      BILLING_BA
  From      WORK_ORDER
 Where      WORK_ORDER_ID = '12345432'
```

What products are associated with the work order?

```
Select      WOC.COMPONENT_TYPE, WOC.CONTRACT_ID,
            WOC.INFORMATION_ITEM_ID, WOC.INFO_ITEM_TYPE,
            WOC.INSPECTION_ID, WOC.PHYSICAL_ITEM_ID,
            WOC.SEIS_SET_ID, WOC.SEIS_SET_TYPE,
            WOC.SEIS_TRANSACTION_ID, WOC.TRANSACTION_TYPE
  From      WORK_ORDER WO, WORK_ORDER_COMPONENT WOC
 Where      WO.WORK_ORDER_ID = '12345432'
   And      WOC.WORK_ORDER_ID = WO.WORK_ORDER_ID
```

What project did I start to track completion of this work order?

```
Select      P.PROJECT_NAME, P.PROJECT_ID
  From      PROJECT P, PROJECT_COMPONENT PC
 Where      PC.WORK_ORDER_ID = '1234565432'
   And      PC.PROJECT_ID = P.PROJECT_ID
```

Appendix B: Changes to the Model

The PPDM Association has made a concerted effort to reduce the impact of new model development on members who are using other versions of PPDM. However, any new development is accompanied by some changes. Arriving at a model that is sufficiently detailed to meet the business needs of every member and yet flexible or abstract enough to be shielded from corporate or regulatory variations is complex, but achievable. Every attempt is made to ensure the model complies with, but is relatively independent of, specific jurisdictional requirements, changes in government policy, regulations or structure that may at times invalidate portions of the model. Internal re-engineering of business processes in industry companies may affect business requirements, which in turn drive the data model. Rapid technological changes may also affect the model structure.

This section identifies all applicable changes from the latest version to the newest release version, to help members implement the latest version of the PPDM model.

Changes Between Versions 3.5 and 3.6

The seismic work group undertook many important changes to the Information and Product Management Module. Many of these changes were provided to support management of digital information, either as stored directly in the database, or externally in magnetic or digital media. A short summary follows:

RM_AUX_CHANNEL	This is a new table
RM_CIRCULATION	Minor or no changes
RM_CIRC_PROCESS	Minor or no changes
RM_COMPOSITE	This is a new table
RM_COPY_RECORD	This is a new table
RM_CREATOR	This is a new table
RM_CUSTODY	This is a new table
RM_DATA_CONTENT	Minor or no changes
RM_DATA_STORE	Minor or no changes
RM_DECRYPT_KEY	This is a new table
RM_DOCUMENT	This is a new table
RM_ENCODING	This is a new table
RM_EQUIPMENT	This is a new table
RM_FILE_CONTENT	This is a new table
RM_INFORMATION_ITEM	Created super-sub type implementation
RM_INFO_ITEM_CONTENT	Added FK references
RM_INFO_ITEM_DESC	This is a new table
RM_INFO_ITEM_GEOMETRY	Minor or no changes

RM_INFO_ITEM_ORIGIN	Minor or no changes
RM_LITH_SAMPLE	This is a new table
RM_MAP	This is a new table
RM_PHYSICAL_ITEM	Added columns
RM_PHYS_ITEM_CONDITION	This is a new table
RM_PHYS_ITEM_MAINT	Minor or no changes
RM_PHYS_ITEM_ORIGIN	Minor or no changes
RM_PHYS_ITEM_STORE	Minor or no changes
RM_SEIS_TRACE	This is a new table
RM_TRACE_HEADER	This is a new table

Changes Between Versions 3.6 and 3.7

The well log and biostratigraphy work groups expanded the RM module to support business activities related to managing well logs, curves, fossils and Lithologic samples. Accordingly, the following tables have been added to the data model or significantly revised.

RM_FOSSIL	This is a new table
RM_WELL_LOG	This is a new table
RM_PHYSICAL_ITEM	This table has been expanded in functionality.
RM_IMAGE_COMP	This is a new table
RM_IMAGE_SECT	This is a new table
RM_IMAGE_LOC	This is a new table

Changes Between Versions 3.7 and 3.8

Tables were added to expand the capability of PPDM to manage physical data stores and other information. Meta data, as defined by FGDC and ISO and Dublin core have been supported. Please check the data mappings for detailed information about changes or additions to other tables.

RM DATA STORE HIER	This is a new table
RM DATA STORE HIER LEVEL	This is a new table
RM DATA STORE ITEM	This is a new table
RM DATA STORE MEDIA	This is a new table

RM DATA STORE STRUCTURE	This is a new table
RM INFO ITEM ALIAS	This is a new table
RM INFO COORD QUALITY	This is a new table
RM INFO DATA QUALITY	This is a new table
RM INFO ITEM BA	This is a new table
RM INFO ITEM GROUP	This is a new table
RM INFO ITEM MAINT	This is a new table
RM INFO ITEM STATUS	This is a new table
RM KEYWORD	This is a new table
RM PHYS ITEM GROUP	This is a new table
RM SPATIAL DATASET	This is a new table
RM THESAURUS	This is a new table
RM THESAURUS GLOSSARY	This is a new table
RM THESAURUS WORD	This is a new table
RM THESAURUS WORK XREF	This is a new table