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Request For Proposal

Information Models for Property and Casualty Insurance

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Letters of Intent due: October 2007
Submissions due: December 2007

Objective of this RFP

This RFP solicits proposals for 'Information Models' to address the data management needs of the P&C Insurance Community. It is expected that submitters of these models will utilize OMG's Model Driven Architecture principles and related standards (http://www.omg.org/mda/). Use of existing P&C industry standards (ACORD for example) as a source of the proposed P&C Business Glossary is encouraged.

Submitters of this RFP are also encouraged to review and reuse (as applicable) the ongoing work by OMG's Finance Domain Task Force (FDTF http://fdtf.omg.org) covering Payment interoperability, security and identity management of financial transactions as well as interchange of P&C metadata. This work assumes further significance as P&C carriers look to utilize the information models towards development of P&C 'Business Services' to better understand and automate their business processes and functions.

As also noted in section 6.1.1, Fig. 2, the RFP solicits the following mandatory components:

- Glossary of P&C Business Terms and accompanying metadata (source, version, format as well as Party, Party Role, Address for example)
- A Conceptual Data Model representing P&C business concepts with a target audience of business Subject Matter Experts, data modelers and business analysts for example.
- A fully attributed Logical (ER) Data Model with appropriate identifiers, logical data types and relationships as appropriate.
- Traceability of P&C Business Terms to models (and model elements) listed above as well as valid semantic variations where applicable (synonyms, geographical variations etc.)
- XMI representation of the above models to facilitate interchange of P&C metadata among data management tools. In this context, submitters are encouraged to review and utilize work being done in OMG FDTF on UML to XMI conversion process (see section 6.4.3 for additional information).

As also noted in section 6.1.1, Fig. 2, the following are optional components:

- A Relational database Model (a.k.a. Physical Data Model) derived from the Logical Data Model to support development and interoperability of transactional systems.
- A Dimensional Model (a.k.a. Star Schema that consists of 'Fact' Tables and 'Dimensions') derived from the Logical Data Model to support P&C Analytics (Data Warehouse/Data Mart, Business Intelligence Tools).
- An XML Schema Model to support P&C data exchange and development of Web Services.
- P&C domain vocabulary ontology(ies) to support vocabulary reuse across models, reasoning (model consistency checking, validation, and so forth), use in business rule development, and utility for development of semantically enriched Web Services.

~~XMI representation of the above models to facilitate interchange of P&C metadata among data management tools. In this context, submitters are encouraged to review and utilize work being done in OMG FDTF on UML to XMI conversion process (see section 6.4.3 for additional information)~~.

- Traceability of P&C Business Terms to models (and model elements) listed above as well as valid semantic variations where applicable (synonyms, geographical variations etc.)

For further details see Chapter 6 of this document.

Discussion will take place on the mailing list pandc-rfp@omg.org. Non-OMG members may sign up for this list (by emailing request@omg.org) until the RFP is formally approved and issued.

6.0 Specific Requirements on Proposals

6.1 Problem Statement

6.1.1 P&C Information Management

The 21st century enterprise, being heavily technology dependent and globally dispersed, must be 'Agile' in order to successfully compete in the 'Flat World'. With the continuing emphasis on outsourcing business processes and technology functions, running a globally dispersed, 24x7 organization poses its unique challenges as well. The above constraints almost mandate accurate understanding of the enterprise 'Assets' (People, Business Functions, Processes, Technology Portfolio, Information-'Data and its Metadata' to name a few) and the inter-dependencies among these 'Assets'. Business stakeholders want the products and services to be delivered better, cheaper and faster while living with the behemoth legacy systems. Furthermore, globalization and the Internet have resulted in the need to define more loosely coupled, interoperable business processes and associated software components executable in distributed and heterogeneous environments.

In order to support the much needed 'Agility', business functions and associated processes must be supported by semantically accurate and reusable Information (Data and its associated Metadata). Information modeled and/or mapped to domain specific standards further enhances its value and interoperability. Service Oriented Architecture (SOA) is often touted as the solution that will drive 'Agility'. XML based domain standards have been often used with success in exchanging information internally and externally. However the domain specific XML standards often cater to an inter-enterprise exchange of Data and offer very little (if at all) semantic richness and traceability to alternate realizations of the same Information (for example in databases and applications).
Typically, organizations develop their own XML Schemas using Schema editors. A side-effect of such an approach is that the XML tags are not in sync with the core business concepts. Therefore, developing an XML Schema model using the MDA approach by transforming a data model can not only preserve semantic accuracy and consistency but also preserves features like Primary/Foreign keys, relationships into ID and IDRefs in the XML Schema. Maintenance of XML Schemas generated from models is easier as well.

The OMG P&C WG has embarked upon applying the proven Model Driven Architecture approach (http://www.omg.org/mda/) to development of a set of P&C Information models traceable from an accepted set of business-driven concepts (Claim or Policy for example). We also recognize that there are several providers and consumers of such 'Business Concepts' in an enterprise. Therefore, the proposed P&C Information models must accommodate the need to represent the same business concept visually and otherwise (text for example) via a set of Models targeted for a variety of 'providers and consumers'. Figure 1 depicts the above approach. Please note that 'Traceability' indicated in Fig.1 is 'bi-directional' i.e. from a business concept (Claim or Policy for example) to the Conceptual, Logical, Physical data models, XML Schema and DDL elements and vice versa.

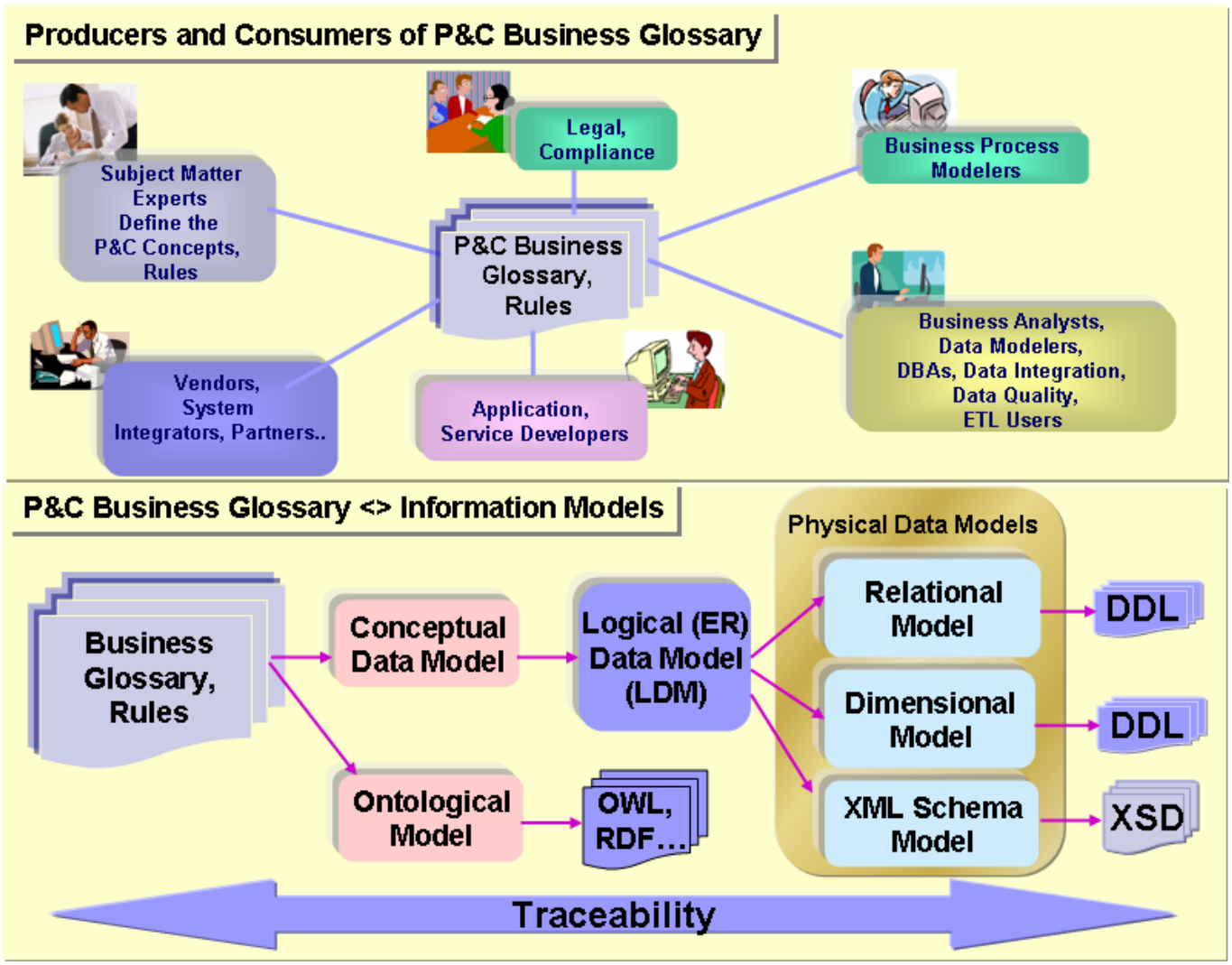

Fig.1 P&C Business Glossary: the enabler of semantic accuracy, interoperability and traceability across models

In addition, these models must be exchangeable using industry standard XML formats (such as XMI) to drive interoperability among tools and repositories. In order to address needs of different stakeholders there are mandatory components and optional components of the proposed P&C standard (please refer to Fig. 2).

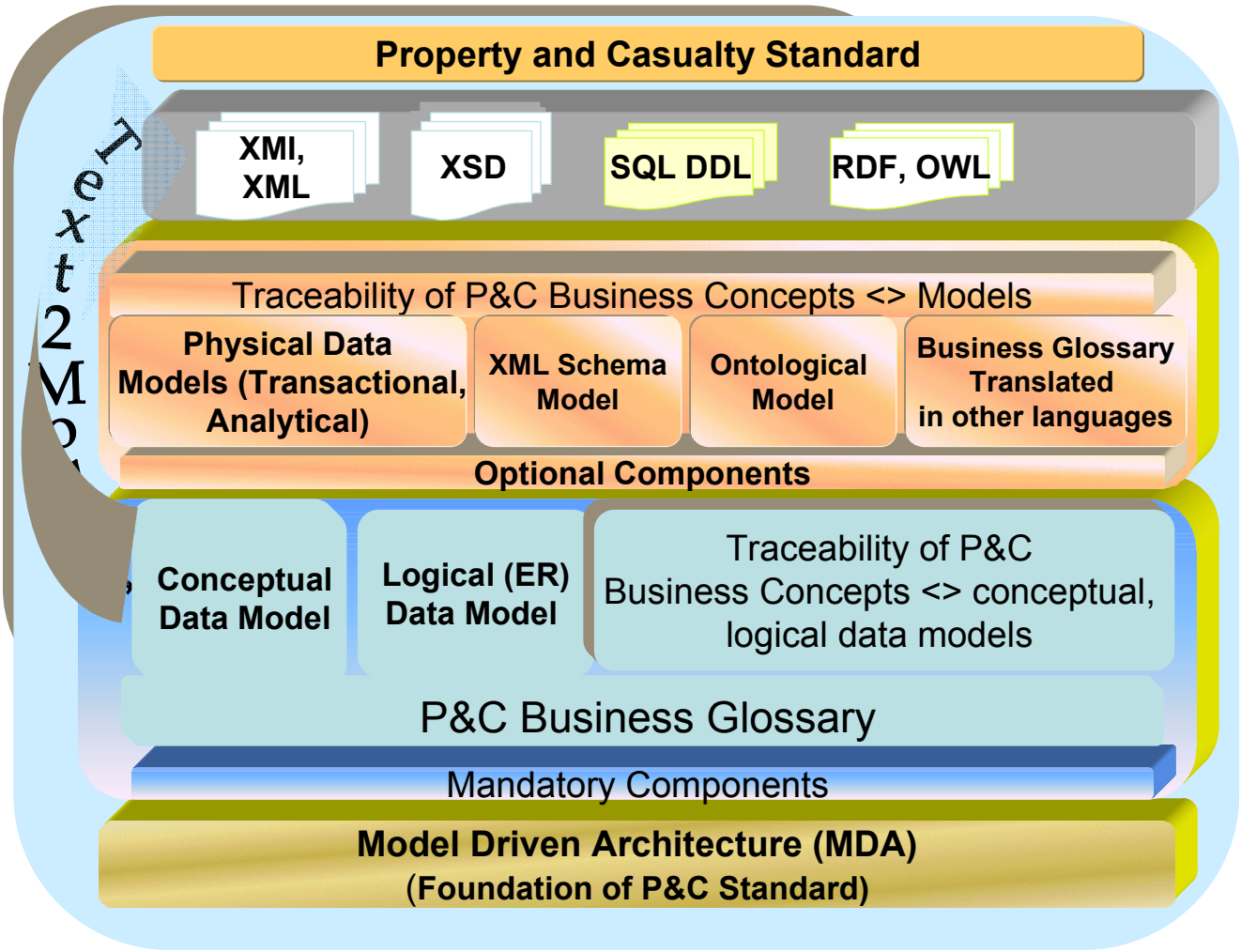

Fig.2 P&C Standard: An overview

6.1.2 Glossary of P&C Business Terms and accompanying metadata

It is widely recognized that lack of common understanding of business terms across an enterprise manifests itself into poor quality of its information systems culminating into erroneous decision making and higher cost. Traditional data integration approaches leading to development of data warehouses were portrayed as a solution to the mistakes made during database design and/or at the source of data acquisition (no validation of rules, formats etc.). However, data warehousing did not always solve the problem of semantic heterogeneity. A significant amount of money is spent on data quality tools to analyze why data does not conform to the rules defined in the data model or otherwise.

With the proliferation of web based applications often developed by geographically distributed development teams disconnected from the business users/SMEs, it becomes even harder to achieve semantic accuracy. Although traditional data dictionaries have been developed by many organizations, maintaining the currency and traceability of business terms across various models has been an uphill task. Typically, business analysts, data modelers, data integration/service integration experts approach the business user/SME to gather requirements. Even though the business terms are often consistent, we end up with different semantics in data models, XML schemas, applications and databases. When valid reasons for variations in business concepts exist, it is hard to trace them to the original concept.

With the above factors in mind, submitters are urged to not only submit a standard Glossary of P&C Business Terms but also the ability to accommodate valid variations that are not part of the standard and used extensively while awaiting becoming part of a standard.

In addition, metadata pertinent to the business terms must be provided to develop and maintain a rich P&C Glossary. It is envisioned that documenting metadata like source of the P&C terms, format, date, version and valid variations will also lead to rationalization of terms used across the P&C industry.

Submitters are encouraged to use the business dictionary developed by ACORD.

P&C Terms and definitions are also documented in IBM's IAA model (http://www-03.ibm.com/industries/financialservices/doc/content/solution/278918103.html), Prima-Solutions' IBCS-reference model for insurance (http://www.prima-solutions.com/frontOffice/produits/primaIBCS.jsp?lang=in) and a dimensional model developed by Penn National. Submitters are encouraged to work with ACORD to rationalize the semantics captured in these models and submit an industry standard P&C Glossary.

Use of horizontal modeling standards like OMG's Semantics of Business Vocabulary & Rules (SBVR, see section 6.3.4) can facilitate the documentation and maintenance of the glossary and related metadata.

6.1.3 A Conceptual Data Model (CDM) representing P&C business concepts with a target audience of business SMEs/users/analysts.

A conceptual model is a visual depiction of business concepts and their relationships at a high level. It describes 'Things' that matter to the business. 'Party' buys a 'Policy' that can be an Auto Policy, Home Policy is one such example. The P&C CDM must be developed using the standard P&C business glossary.

6.1.4 A fully attributed Logical (ER) Data Model (LDM) derived from the Conceptual Data Model with appropriate Identifiers, logical data types and Relationships as appropriate.

A logical data model further refines the CDM by identifying Attributes that are pertinent to a business concept represented as an 'Entity' ('Policy' for example). It captures additional details about the 'Policy' including unique ways to identify a Policy as well as details of how a Policy may be related to other business concepts like 'Party' for example. It can also add further subsidiary Entities that are important but less fundamental to the business. The LDM must be derived from CDM and be platform independent. The P&C LDM must provide:

- P&C Entities and their definitions
- Attributes and their definitions
- Identifiers like Primary key and optionally Foreign Keys as wells as composite keys where more than a single attribute is needed to uniquely identify records.
- Relationships among the entities (identifying and non-identifying, many-to-many, parent-child); Cardinality of relationships (as appropriate)
- Valid Sub-types (including exclusive/inclusive, incomplete/complete)

  of Entities where appropriate.
- Valid logical data types (also known as Primitive Types), domain names and Classwords

6.1.5 A Relational Database Model (a.k.a. Physical Data Model, RDM) derived from the Logical Data Model to support development of transactional systems.

The relational model must be derived from the P&C LDM. This model should be sufficient to represent a complete database but might be further refined to a RDBMS specific physical data model (supporting RDBMS specific datatypes, storage parameters for example). However, specifying RDBMS specific features is not within

the scope of this RFP as the RDBMS often varies across and within an enterprise as well. Submitters must provide:

- P&C Tables and Columns
- Physical data types and precision
- Identifiers (as captured in the LDM i.e. Primary keys, Foreign Keys with appropriate constraints) but additional identifiers like Alternate key for Indexing/faster searching capability and Inversion Keys
- Resolution of many-to-many relationships (Association tables)
- Resolution of Sub-types (to avoid any performance degradation)
- Reference metadata (look-up tables like state codes, country codes etc. as appropriate). Use of standards where appropriate (like ISO Country Codes) is highly recommended

6.1.6 A fully attributed Dimensional Model (a.k.a. Star Schema) that consists of 'Fact' Tables and 'Dimensions') derived from the Logical Data Model to support P&C Analytics (DW/Data Mart, BI Tools). Though it is possible to realize dimensional models on dedicated multidimensional databases (such as Oracle OLAP, Hyperion Essbase) this RFP is requesting a physical realization on a relational database.

While developing transaction systems to support P&C business functions is deemed important, the need to analyze the data stored in these systems has resulted in Analytics oriented models for development of Data Warehouse/Data Marts and business intelligence reporting. Dimensional models are typically organized as Star Schema that consist of Fact Tables – that capture the 'Measures' like Revenue, Premium

Typically Fact Tables allow the aggregation of Measures to slice-and-dice information at varying levels of granularity. Often, non-measurable facts are also included (analyzing attendance for a course for example)

Examples of Dimensions are (for a typical definition of the concepts below, please refer to the ACORD data dictionary http://www.acord.org/dataDictionary/dataDictionary.htm): Geography, Policy, Industry, Class Code, Time, Payment, Litigation, Services, Subrogation Service, Independent Service Adjuster (Events), Accident, Catastrophe (Loss Unit), Statistical Codes, Claim Occurrence Dimension. Please refer to section 6.4.6 for OMG's work on Payments interoperability standardization.

Dimensions are considered 'Conformed' if they adhere to a common structure, and therefore allow queries to be executed across star schemas. For example, the Calendar or Time dimension is commonly needed.

The P&C Dimensional model should consist of the following:

- Set of conformed Dimensions where applicable
- A set of Fact Tables that provide a standard set of measurements to support:
  - Regulatory requirements reporting
  - Loss Analysis
  - Policy Event analysis
  - Underwriting analysis
  - Policyholder behavior analysis
  - Customer Risk analysis

Each P&C Carrier may want to analyze the transactional data in different ways and ask different questions. Hence the Fact Tables and their granularity should be left to each carrier to implement internally. The exception to this may be any regulatory reporting scenarios where a standard set of reports/questions are asked and must be provided as part of compliance to regulatory requirements.

6.1.7 XML Schema model

Purpose of this model is to support P&C data exchange and development of Services. A key aspect of this standard is that the XML elements be traceable from the business concepts and logical, physical data models. This allows direct lineage to be established into different physical forms such as relational database, business analytics etc.

The XML Schema model will include:

- One or more XML Schemas (these may be factored as appropriate to promote reuse)
- Complex Types corresponding to Entities in the LDM
- XML IDs corresponding to Primary Keys in the LDM
- Nested elements and XML IDREFs corresponding to relationships in the LDM
- Simple Types corresponding to Domains in the LDM

6.1.8 P&C Ontology model to support semantic reasoning, rules engines

One or more ontology components for P&C, developed in parallel with and reusing the terminology represented in the Conceptual Data Model, including:

- UML-based representation using the UML profiles for the Resource Description Framework (RDF)
- Web Ontology Language (OWL) from the Ontology Definition Metamodel (ODM)
- An ODM-compliant XMI representation
- A description logics (DL) compliant RDF/XML serialized representation.
- Optional extensions may include ontology components developed in parallel with the XML Schema to augment data services with semantics for downstream use in Semantic Web Services.

6.1.9 Traceability of P&C Business Terms to models listed above as well as valid semantic variations where applicable (synonyms, geographical variations etc.).

Traceability of P&C business concepts across the models described above is critical to support the vision established by the OMG P&C WG. Traceability maps must include:

  - Traceability from the Business Glossary to their corresponding model elements in conceptual, logical, relational, dimensional, XML Schema, XMI and Ontology models.
  - Traceability must be bi-directional and enable impact analysis of changes (if a business concept changes, what is the impact on the models that consume the business concept in question) i.e. dependency maps.

6.2 Scope of Proposals Sought

In summary this RFP seeks proposals that cover the following P&C business areas:

- Glossary of P&C Business Terms and accompanying metadata (definition, source (SME/Authority/Standard…), format, date, revisions/version, Acronyms for example) covering the following ((for a typical definition of the concepts below, please refer to the ACORD data dictionary http://www.acord.org/dataDictionary/dataDictionary.htm):
  - Premium/Policy Management
    - Provides the ability to measure the type of activities performed for a given Policy to evaluate the effectiveness of Policy processing.

- Supports analysis of the timeliness of Premium entry and audit activities. Some of the key information needed would include;
  - Premiums entered (Deposit, Endorsements, Audits)
  - New Business and Policy Count
  - Renewal Business and Policy Count
  - Cancelled Business and Policy Count
  - Inforce Business and Policy Count
  - Coverage Cancellations
  - Audit Activity (Timeliness, Completed)
- Compensation
- Contract Management
- New Business (underwriting process)

o Claims

- The key information provided will satisfy Calendar, Accident and Policy Effective date analysis and trending of:
  - Outstanding Loss Reserves
  - Paid Losses and Expenses (Legal, Other)
  - Recoveries (Deductible, Salvage, Subrogation)
- Key metrics can be viewed with additional detail by:
  - Claim
  - Claimant
  - Claims Service Organization
  - Accident Date
  - Calendar Date
  - Loss Location
- Provides the ability to measure the type of activities performed for a given claim to evaluate the effectiveness of claims processing.

- Supports the analysis of actual expenses, merit increase calculations, or variable compensation payouts. Some of the key information would be:
  - Detail Expenses
  - Paid Loss
  - Reserve Adjustments
  - Number of Payments per Claim
  - Number of Times Reopened
  - Number of Transactions per Claim

- Billing
- Agency
  - The key information provided will satisfy the analysis and trending of:
    - Written and Earned Premiums
    - Losses
    - Loss Ratios
    - Policy quotes, submissions and hit ratios
    - Planned vs. Actual
  - Key metrics can be viewed by:
    - Agency Group and Individual Agencies
    - Line of Business
    - Company
    - Underwriting Organization
    - Market Segments
    - Time (Monthly, Quarterly, Yearly)

- Reference metadata that supports the above concepts (not a complete list)
  - Party, Party Role
  - Products
  - Account
  - Address
  - Geography

Reference metadata modeled in other standards (such as Organization Structure metamodel –OSM and/or Party model from OMG and non-OMG standards like ACORD) should be leveraged.

- A Conceptual Data Model representing P&C business concepts with a target audience of business SMEs/users/analysts.
- A fully attributed Logical Data Model derived from the Conceptual Data Model with appropriate Identifiers, logical data types and Relationships as appropriate.
- A fully attributed Relational database Model (a.k.a. Physical Data Model) derived from the Logical Data Model to support development and interoperability of transactional systems.
- A fully attributed Dimensional Model (a.k.a. Star Schema that consists of 'Fact Tables and Dimensions) derived from the Logical Data Model to support P&C Analytics (DW/Data Mart, BI Tools).
- An XML Schema model to support P&C data exchange and development of Data Services.
- XML Metadata Interchange (XMI, http://www.omg.org/technology/documents/formal/xmi.htm) representation of the above models to facilitate interchange of P&C metadata among data management tools (data modeling/DB mgmt., DW, Data Quality, ETL, BI tools and metadata repositories).
- P&C Ontology to support:
  - Development of semantic web services and use in Semantic reasoning, rules engines,
  - Support generation of OWL (Ontology Web Language) and Resource Description Framework, Common Logic, Topic Maps and Description Logic.

- Traceability of P&C Business Terms to models listed above as well as valid semantic variations where applicable (synonyms, geographical variations etc.)

6.3 Relationship to Existing OMG Specifications

6.3.1 UML 2

UML2 may be used to define the Conceptual Data Model.

6.3.2 Ontology Definition Metamodel (ODM)

This provides coverage of conceptual information modeling in a variety of technologies (RDFS, OWL, Taxonomy Maps, Common Logic, ER) in both metamodel and UML 2 Profile. ODM must be used to represent the Ontology Model.

6.3.3 Semantics of Business Vocabulary and Rules (SBVR)

This covers business concepts and rules expressed in semi-formal natural language with a logic- and MOF-based formal underpinning. SBVR may be used to define the Business Glossary.

6.3.4 MOF Queries Views Transformations (QVT)

This covers the areas of model-to-model transformations. It may be used to express the derivations between the models required by this RFP.

6.3.5 Common Warehouse Metamodel (CWM)

Prior to the adoption of IMM (see next section) the CWM standard provides OMG's normative metamodel for Relational Database and OLAP that must be used to represent the P&C XML Relational and Dimensional models.

The CWM Business Nomenclature metamodel may be used for the Business Glossary as a simpler alternative to SBVR, though the latter is preferred.

The non-normative CWM Extensions (CWMX) includes a metamodel for Entity Relationship that submitters may use for the CDM or LDM.

Note that the XML metamodel from CWM must not be used for this submission. CWM XML Metamodel predates XML Schema and does not allow many parts of an XSD to be represented; furthermore the Eclipse XSD metamodel is already an OMG standard: it has already been adopted in the XMI specification.

6.3.6 XMI

Prior to the adoption of IMM (see next section) the XMI standard provides OMG's normative XML Schema metamodel that must be used to represent the P&C XML Schema model.

6.3.7 OMG Party Model

This provides a CORBA-oriented model for parties in a financial contract and may be relevant.

6.4 Related Activities, Documents and Standards

6.4.1 Information Management Metamodel (IMM)

This standard, under development http://www.omgwiki.org/imm/doku.php will provide metamodels and UML Profiles for XML Schema, Relational and Dimensional modeling. Submitters are strongly encouraged to intercept this standard.

6.4.2 The Standard Conversion Maps for Payment Data RFP

Submitters looking to respond to 'Payment' subject area in the Dimensional and other data models including mapping to ACORD P&C messages should consider FDTF's effort on developing conversion maps for Payments processing internally as well as across enterprises. http://www.omg.org/cgi-bin/doc?finance/2005-11-01 provides additional details on Payment conversion maps.

The Finance Domain Task Force intends to formulate and publish standardized, structured, certifiable message format conversions so that messages can be moved confidently from one payment network to another and message formats can evolve without requiring legacy applications to abandon the older formats. The widespread use of message conversion standards will significantly reduce the trillion dollar cost and the engendered inefficiency of payment data errors

6.4.3 The XMI Default Parameters for ISO 20022 RFP (XMI and Other Model-Driven XML Standards)

http://www.omg.org/cgi-bin/doc?finance/2005-11-02 RFP seeks to better align the XMI and ISO 20022 standards for metadata interchange. ISO 20022 defines a UML-based methodology for modeling business transactions, message flows, and messages, and defines a set of rules for deriving XML schemas from the UML models. Although not directly within the scope of this RFP, submitters are encouraged to review this work in the context of developing P&C 'Business Services' as well as exchange of P&C metadata across heterogeneous tools/repositories..

6.4.4 Security and Identity Management

Although the security and identity management of P&C models to be submitted is not directly in scope of this RFP, submitters are encouraged to review the work being done by OMG FDTF that aims to address the above aspects. Additional classifications of data being modeled as 'Sensitive' could be an aspect of P&C models that may benefit from FDTF work. Similarly, identity management across different P&C distribution channels may be of interest to submitters. Please refer to http://www.omg.org/docs/finance/07-03-05.doc for details.

6.4.5 ACORD global data Dictionary

Submitters should consider use of the P&C business concepts defined in ACORD global data dictionary (http://www.acord.org/dataDictionary/index_dataDictionary.aspx)

6.4.6 UNCEFACT's Core Components (CCTS)

The Core Components Technical Specification (CCTS, http://75.43.29.149:8080/display/public/CCTS+-+Core+Components+Technical+Specification) describes and specifies a new approach to the well-understood problem of the lack of information interoperability between applications in the e-business arena. Traditionally, standards for the exchange of business data have been focused on static message definitions that have not enabled a sufficient degree of interoperability or flexibility. The CCTS presents a methodology for developing a common set of semantic building blocks that represent the general types of business data in use today and provides for the creation of new business vocabularies and restructuring of existing business vocabularies.

In addition, a UML Profile for Core Components (http://www.untmg.org/index.php?option=com_content&task=view&id=58&Itemid=69) is also under development. Submitters are encouraged to review the core components like email, Address to develop the "Reference Tables" for the P&C Information models.

6.4.7 ACORD P&C XML Schemas

ACORD has published XML Messages and associated XML Schemas/DTDs at: http://www.acord.org/Standards/propertyxml.aspx Submitters are encouraged to review these Schemas.

6.4.8 Object Role Modeling (ORM)

Object Role Modeling (ORM, http://www.orm.net/) is a powerful method for designing and querying database models at the conceptual level, where the application is

described in terms easily understood by non-technical users. In practice, ORM data models often capture more business rules, and are easier to validate and evolve than data models in other approaches. This may be used for visually representing the CDM.

6.4.9 IBM's IAA model

IBM Insurance Application Architecture (IAA) includes a business model; a design model of components, interfaces and messages; a generic design framework for product definition and agreement administration; and design models for the creation of data warehouses. This model could serve as a source of definitions along with the ACORD and Penn National's Analytics model.

http://www-03.ibm.com/industries/financialservices/doc/content/bin/IAA_Poster.pdf?g_type=rhc

6.4.10 Prima-Solutions' reference model for insurance (IBCS-UML model)

http://www.prima-solutions.com/frontOffice/produits/primaIBCS.jsp?lang=in

Prima IBCS™ is an insurance object model (UML) covering most of the insurance domain areas. This model could serve as a source of definitions along with the IAA, ACORD and Penn National's Analytics model.

6.4.11 IDEF 1X

Submitters are referred to this as a commonly used notation that may be used for visually representing the LDM or RDM. See [IDEF1X] and [IDEF1X Hay]

6.4.12 Information Engineering

Submitters are referred to this as a commonly used notation that may be used for visually representing the LDM or RDM. See [IE Hay].

6.5 Mandatory Requirements

6.5.1 Glossary of P&C Business Terms as described in 6.1.2

Business Terms must be defined in English, though a more formal definition using SBVR is also encouraged.

The following metadata associated with each Business Term must also be provided:

- Format

- Source (date, version) Provenance

Relationships between terms must be defined, such as:

- Generalizations/specializations
- Synonyms/aliases
- Related terms

6.5.2 Submitters must provide a P&C Conceptual Data Model (CDM) as described in 6.1.3.

The CDM shall consist of business Entities and Relationships.

Each shall be mapped to one or more Terms in the Business Glossary.

The CDM shall be represented using either UML or the CWMX Entity Relationship metamodel.

The CDM shall be visualized using one or more of the following notations: UML, IDEF1X, IE, ORM

6.5.3 Submitters must provide a fully attributed P&C Logical Data Model (LDM) as described in 6.1.4.

The LDM shall consist of Entities, Attributes, Relationships and Subject Areas.

Each shall be mapped to one or more Terms in the Business Glossary.

The LDM shall be represented using the CWMX Entity Relationship metamodel.

The LDM shall be visualized using one or more of the following notations: IDEF1X, IE.

6.5.4 Submitters must provide Traceability of P&C concepts defined in the Business glossary to their corresponding Conceptual and Logical Data Model components.

6.5.5 XMI representation of the above models to facilitate interchange of P&C metadata among data management tools. In this context, submitters are encouraged to review and utilize work being done in OMG FDTF on UML to XMI conversion process (see section 6.4.3 for additional information).

6.6 Optional Requirements

6.6.1 Submitters may provide a P&C Relational Database Model as described in 6.1.5.

The relational model may be expressed using the CWM Relational metamodel.

Each element may be mapped to one or more elements in the LDM

It may be visualized using one or more of the following notations: IDEF1X, IE.

The RDM may also be provided as a non-normative SQL Data Definition Language file.

6.6.2 Submitters may provide a P&C Dimensional Model as described in 6.1.6.

The dimensional model may be expressed using the CWM OLAP and Relational metamodels.

Each element may be mapped to one or more elements in the LDM

It may be visualized using one or more of the following notations: IDEF1X, IE.

The Dimensional Model may also be provided as a non-normative SQL Data Definition Language file.

A list of Fact Tables other than those described in section 6.1.6 for the Dimensional/Analytical model is an optional requirement.

6.6.3 Submitters may provide a P&C XML Schema model as described in 6.1.7.

The XML Schema model may be expressed using the XML Schema metamodel in the XMI standard.

Each element may be mapped to one or more elements in the LDM

It may be visualized using a UML Profile or a proprietary notation.

The XML Schema may be provided as a usable and publishable XSD file.

6.6.4 Submitters may provide a P&C Ontology as described in 6.1.8

A P&C Ontology may be provided, expressed using the OWL metamodel in the ODM standard. Support for generation of OWL (Ontology Web Language) and Resource Description Framework, Common Logic, Topic Maps and Description Logic may also be provided.

- All elements shall be traced to the Business Glossary.
- It may be visualized using the UML Profile for ODM.
- It may be provided as a usable OWL file.

6.6.5 When submitting Relational, Dimensional, XML and Ontological models, submitters must provide Traceability of P&C concepts defined in the Business glossary to their corresponding Conceptual and Logical Data Model components. Bi-directional Traceability is deemed an important component of the P&C standard.

6.6.6 Provision of Transformations

Submitters may provide formal QVT transformations for the derivations listed in Needs to be discussed. Candidate Transformations are:

- Conceptual model to Logical data model
- Logical data model to relational database model
- Logical data model to Dimensional model
- Relational model to XML Schema model

6.7 Issues to be discussed

These issues will be considered during submission evaluation. They should not be part of the proposed normative specification. (Place them in Part I of the submission.)

6.7.1 Rationale for physical model derivation

Where submitters have needed to make design choices then these must be described together with their rationale. For example:

- The use of elements or attributes or both) in XML Schema

6.7.2 Business traceability

Submitters shall describe how the traceability incorporated into their models allows for understanding of physical elements through linkage back to the business concept.

6.7.3 Impact analysis

Submitters shall describe how the traceability incorporated into their models allows for impact analysis – for example the effect of changing a Relationship in the LDM. For several such scenarios they shall describe how to determine, through navigation/query of the proposed models, the physical elements affected.

6.7.4 Translation of Business Glossary to other languages

Submitters shall be responsible for translation of the P&C Business Glossary to languages other than US English as needed including ongoing maintenance (an optional requirement).

6.8 Evaluation Criteria

Proposals will be evaluated on:

- Ability to seamlessly transform one representation of a model to another without losing semantic integrity
- Similarity and compatibility with existing Glossary and XML Schema standards for P&C from ACORD

6.9 Other information unique to this RFP

None.

6.10 RFP Timetable

The timetable for this RFP is given below. Note that the TF or its parent TC may, in certain circumstances, extend deadlines while the RFP is running, or may elect to have more than one Revised Submission step. The latest timetable can always be found at the OMG *Work In Progress* page at http://www.omg.org/schedules/ under the item identified by the name of this RFP. Note that "<month>" and "<approximate month>" is the name of the month spelled out; e.g., January.

Event or Activity	Actual Date
Preparation of RFP by TF	*May 2007*
RFP placed on OMG document server	*June 1, 2007*

Approval of RFP by Architecture Board *Review by TC*	*June 25, 2007*
TC votes to issue RFP	*June 26, 2007*
LOI to submit to RFP due	*Oct. 15, 2007*
Initial Submissions due and placed on OMG document server ("Three week rule")	*Nov. 19, 2007*
Voter registration closes	
Initial Submission presentations	*December 10 2007*
Preliminary evaluation by TF	
Revised Submissions due and placed on OMG document server ("Three week rule")	
Revised Submission presentations	*June 2008*
Final evaluation and selection by TF *Recommendation to AB and TC*	
Approval by Architecture Board *Review by TC*	
TC votes to recommend specification	*Sept. 2008*
BoD votes to adopt specification	

Appendix A References and Glossary Specific to this RFP

A.1 References Specific to this RFP

The following documents are referenced in this document:

[ACORD Global Data Dictionary]

http://www.acord.org/dataDictionary/index_dataDictionary.aspx

[ACORD P&C Schemas]

http://www.acord.org/Standards/propertyxml.aspx

[IDEF1X FIPS184]
http://www.itl.nist.gov/fipspubs/idef1x.doc

[IDEF1X Hay],
http://www.essentialstrategies.com/publications/modeling/idef1x.htm

[IE Hay]
http://www.essentialstrategies.com/publications/modeling/infoeng.htm

[SQL92]
http://www.itl.nist.gov/fipspubs/fip127-2.htmd

[Object Role Modeling, ORM]

http://www.orm.net/)

[XML Infoset]
http://www.w3.org/

A.2 Terms Specific to this RFP

P&C Conceptual Data Model (CDM) –A high level, technology independent model of P&C business concepts, easily understood by Business community and developed by business analysts/modelers. Used extensively by data management community to capture the high level business requirements.

Logical Data Model (LDM) – A technology independent data model, typically derived from a conceptual data model to add further details (attributes and relationships including referential integrity). A precursor to a relational database model that may be used to develop transactional databases and/or analytical databases (also referred to as Dimensional model).

Relational Database Model(RDM) – Derived from a logical data model with additional physical properties for data storage/retrieval. It can be further configured to achieve RDBMS specific features for performance/transactional integrity.

Dimensional Model (DM)- Also known as a Star Schema, geared towards development of Data Warehouse/Data marts for time-series/historical analysis of data. The Star Schema consists of 'Facts' (things to be measured, can be aggregated –Revenue, Shipments…) and Dimensions such as Product, Customer, Time and Geography.

IDEF 1X -Commonly used notation for logical models of relational databases, standardized by NIST See [IDEF1X FIPS184] and [IDEF1X Hayes].

Information Engineering (IE) – Widely used traditional software development method, focused on data analysis. Includes a commonly used data modeling notation, most famous for using 'crows feet' to represent multiplicity.

Data Definition Language (DDL) – The part of SQL (typically) used for declaring information structures (Tables, Columns, Schemas) as opposed to manipulating them.

Appendix B General Reference and Glossary

B1 General References

The following documents are referenced in this document:

[ATC] Air Traffic Control Specification, *http://www.omg.org/technology/documents/formal/air_traffic_control.htm*

[BCQ] OMG Board of Directors Business Committee Questionnaire, *http://www.omg.org/cgi-bin/doc?bc/02-02-01*

[CCM] CORBA Core Components Specification, *http://www.omg.org/technology/documents/formal/components.htm*

[CORBA] Common Object Request Broker Architecture (CORBA/IIOP), *http://www.omg.org/technology/documents/formal/corba_iiop.htm*

[CSIV2] [CORBA] Chapter 26

[CWM] Common Warehouse Metamodel Specification, *http://www.omg.org/technology/documents/formal/cwm.htm*

[DAIS] Data Acquisition from Industrial Systems, *http://www.omg.org/technology/documents/formal/dais.htm*

[EDOC] UML Profile for EDOC Specification, *http://www.omg.org/techprocess/meetings/schedule/UML_Profile_for_EDOC_FTF.html*

[EJB] "Enterprise JavaBeans™", *http://java.sun.com/products/ejb/docs.html*

[FORMS] "ISO PAS Compatible Submission Template". *http://www.omg.org/cgi-bin/doc?pas/2003-08-02*

[GE] Gene Expression, *http://www.omg.org/technology/documents/formal/gene_expression.htm*

[GLS] General Ledger Specification , *http://www.omg.org/technology/documents/formal/gen_ledger.htm*

[Guide] The OMG Hitchhiker's Guide,, *http://www.omg.org/cgi-bin/doc?hh*

[IDL] ISO/IEC 14750 also see [CORBA] Chapter 3.

[IDLC++] IDL to C++ Language Mapping, *http://www.omg.org/technology/documents/formal/c++.htm*

[MDAa] OMG Architecture Board, "Model Driven Architecture - A Technical Perspective*", http://www.omg.org/mda/papers.htm*

[MDAb] "Developing in OMG's Model Driven Architecture (MDA)," *http://www.omg.org/docs/omg/01-12-01.pdf*

[MDAc] "MDA Guide" (*http://www.omg.org/docs/omg/03-06-01.pdf*)

[MDAd] "MDA "The Architecture of Choice for a Changing World™"", *http://www.omg.org/mda*

[MOF] Meta Object Facility Specification, *http://www.omg.org/technology/documents/formal/mof.htm*

[MQS] "MQSeries Primer", *http://www.redbooks.ibm.com/redpapers/pdfs/redp0021.pdf*

[NS] Naming Service, *http://www.omg.org/technology/documents/formal/naming_service.htm*

[OMA] "Object Management Architecture™", *http://www.omg.org/oma/*

[OTS] Transaction Service, *http://www.omg.org/technology/documents/formal/transaction_service.htm*

[P&P] Policies and Procedures of the OMG Technical Process, *http://www.omg.org/cgi-bin/doc?pp*

[PIDS] Personal Identification Service, *http://www.omg.org/technology/documents/formal/person_identification_service.htm*

[RAD] Resource Access Decision Facility, *http://www.omg.org/technology/documents/formal/resource_access_decision.htm*

[RFC2119] IETF Best Practices: Key words for use in RFCs to Indicate Requirement Levels, (*http://www.ietf.org/rfc/rfc2119.txt*).

[RM-ODP] ISO/IEC 10746

[SEC] CORBA Security Service,
http://www.omg.org/technology/documents/formal/security_service.htm

[TOS] Trading Object Service,
http://www.omg.org/technology/documents/formal/trading_object_service.htm

[UML] Unified Modeling Language Specification, *http://www.omg.org/technology/documents/formal/uml.htm*

[UMLC] UML Profile for CORBA,
http://www.omg.org/technology/documents/formal/profile_corba.htm

[XMI] XML Metadata Interchange Specification, *http://www.omg.org/technology/documents/formal/xmi.htm*

[XML/Value] XML Value Type Specification,
http://www.omg.org/technology/documents/formal/xmlvalue.htm

B2 General Glossary

Glossary - a list of terms in a special subject, field, or area of usage, with accompanying definitions

Architecture Board (AB) - The OMG plenary that is responsible for ensuring the technical merit and MDA-compliance of RFPs and their submissions.

Board of Directors (BoD) - The OMG body that is responsible for adopting technology.

Common Object Request Broker Architecture (CORBA) - An OMG distributed computing platform specification that is independent of implementation languages.

Common Warehouse Metamodel (CWM) - An OMG specification for data repository integration.

CORBA Component Model (CCM) - An OMG specification for an implementation language independent distributed component model.

Interface Definition Language (IDL) - An OMG and ISO standard language for specifying interfaces and associated data structures.

Letter of Intent (LOI) - A letter submitted to the OMG BoD's Business Committee signed by an officer of an organization signifying its intent to respond to the RFP and confirming the organization's willingness to comply with OMG's terms and conditions, and commercial availability requirements.

Mapping - Specification of a mechanism for transforming the elements of a model conforming to a particular metamodel into elements of another model that conforms to another (possibly the same) metamodel.

Metadata - Data that represents models. For example, a UML model; a CORBA object model expressed in IDL; and a relational database schema expressed using CWM.

Metamodel - A model of models.

Meta Object Facility (MOF) - An OMG standard, closely related to UML, that enables metadata management and language definition.

Model - A formal specification of the function, structure and/or behavior of an application or system.

Model Driven Architecture (MDA) - An approach to IT system specification that separates the specification of functionality from the specification of the implementation of that functionality on a specific technology platform.

Normative – Provisions that one must conform to in order to claim compliance with the standard. (as opposed to non-normative or informative which is explanatory material that is included in order to assist in understanding the standard and does not contain any provisions that must be conformed to in order to claim compliance).

Normative Reference – References that contain provisions that one must conform to in order to claim compliance with the standard that contains said normative reference.

Platform - A set of subsystems/technologies that provide a coherent set of functionality through interfaces and specified usage patterns that any subsystem that depends on the platform can use without concern for the details of how the functionality provided by the platform is implemented.

Platform Independent Model (PIM) - A model of a subsystem that contains no information specific to the platform, or the technology that is used to realize it.

Platform Specific Model (PSM) - A model of a subsystem that includes information about the specific technology that is used in the realization of it on a specific platform, and hence possibly contains elements that are specific to the platform.

Request for Information (RFI) - A general request to industry, academia, and any other interested parties to submit information about a particular technology area to one of the OMG's Technology Committee subgroups.

Request for Proposal (RFP) - A document requesting OMG members to submit proposals to the OMG's Technology Committee. Such proposals must be received by a certain deadline and are evaluated by the issuing task force.

Task Force (TF) - The OMG Technology Committee subgroup responsible for issuing a RFP and evaluating submission(s).

Technology Committee (TC) - The body responsible for recommending technologies for adoption to the BoD. There are two TCs in OMG – *Platform TC* (PTC), that focuses on IT and modeling infrastructure related standards; and *Domain TC* (DTC), that focus on domain specific standards.

Unified Modeling Language (UML) - An OMG standard language for specifying the structure and behavior of systems. The standard defines an abstract syntax and a graphical concrete syntax.

UML Profile - A standardized set of extensions and constraints that tailors UML to particular use.

XML Metadata Interchange (XMI) - An OMG standard that facilitates interchange of models via XML documents.