

The Financial Industry Business Ontology

Demystifying Financial Industry Semantics
March 13 2012

Overview

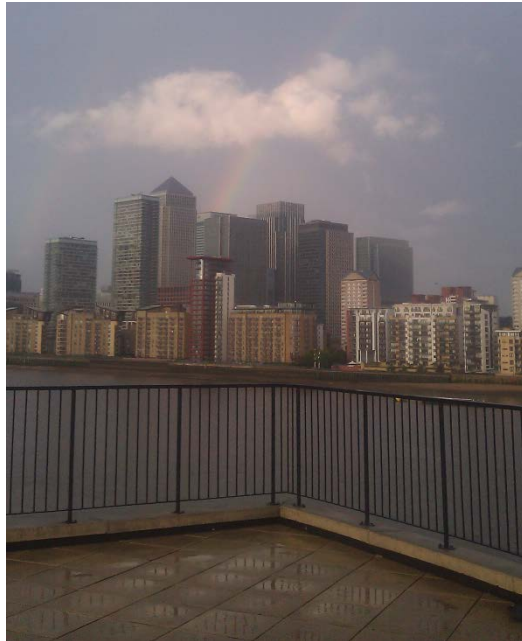
- Background to Financial Industry Semantics
- EDM Council Semantics Repository history
- Financial Industry Business Ontology
 - Collaboration with the Object Management Group
- What you can expect
- Training and certification through the OMG

The View From My Place



← **Some
banks**

The View From My Place



← **Some
banks**

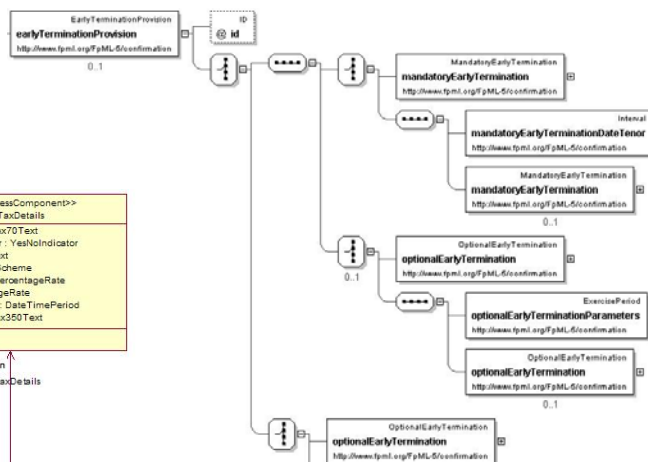
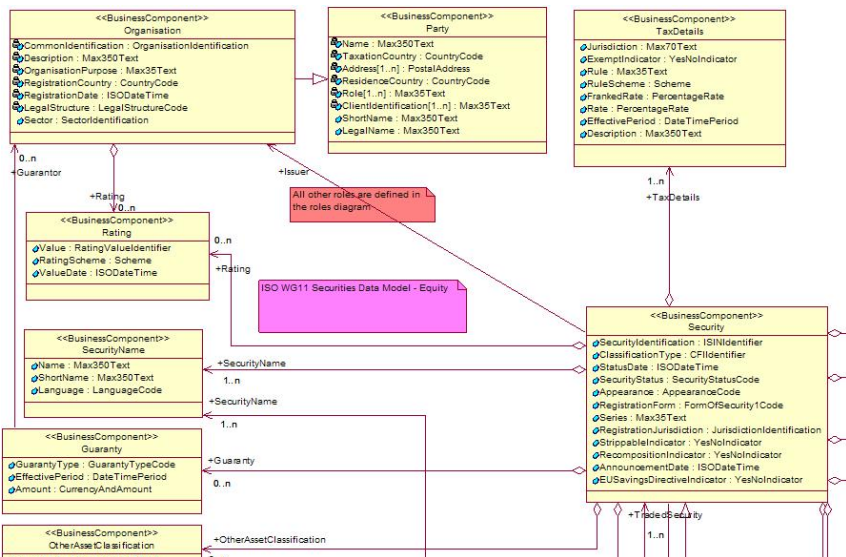
Some IT Firms →



Data Governance

- A Bank is in essence an IT Company
 - Software manufacturing
 - Data production, consumption,
 - Information supply chain
- So how do we manage the business view of data?
 - Language interface business to IT
 - Conceptual model

Managing Semantics

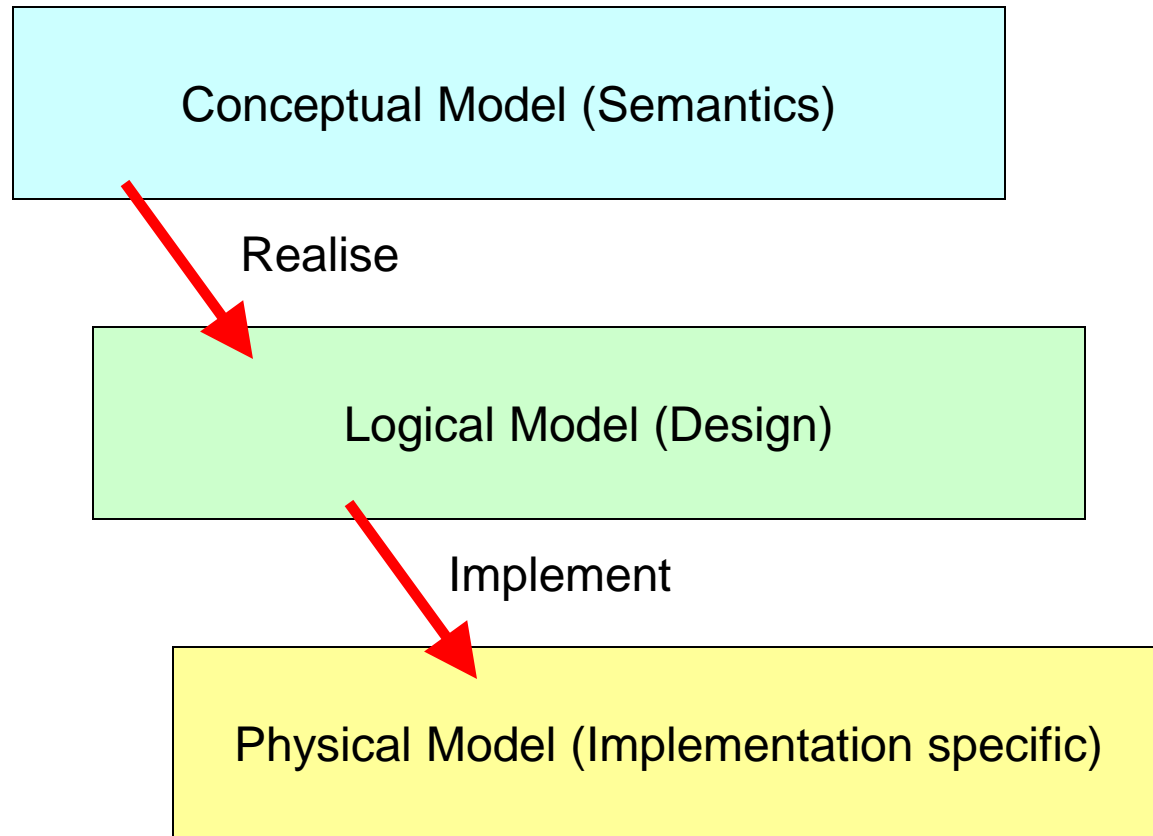


```

<!-- swap -->
<!-- chase pays the floating rate every 6 months, based on 6M EUR-LIBOR-BBA,
on an ACT/360 basis -->
<swapStream>
  <payerPartyReference href="party1" />
  <receiverPartyReference href="party2" />
  <calculationPeriodDates id="floatingCalcPeriodDates">
    <effectiveDate>
      <unadjustedDate>1994-12-14Z</unadjustedDate>
      <dateAdjustments>
        <businessDayConvention>NONE</businessDayConvention>
      </dateAdjustments>
    </effectiveDate>
    <terminationDate>
      <unadjustedDate>1999-12-14Z</unadjustedDate>
      <dateAdjustments>
        <businessDayConvention>MODFOLLOWING</businessDayConvention>
        <businessCenters id="primaryBusinessCenters">
          <businessCenter>DEFR</businessCenter>
        </businessCenters>
      </dateAdjustments>
    </terminationDate>
    <calculationPeriodDatesAdjustments>
      <businessDayConvention>MODFOLLOWING</businessDayConvention>
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    </calculationPeriodDatesAdjustments>
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      <period>M</period>
      <rollConvention>14</rollConvention>
    </calculationPeriodFrequency>
  </calculationPeriodDates>

```

Conceptual Model for Data



Conceptual Model Requirements

- Must be owned and validated by business
 - Manage the “Language interface” between tech and business subject matter experts
 - Everything should be in English
 - No techie terms and casing like “objectProperty”
 - Everything should be reviewable
 - Spreadsheets
 - dialect-free diagrams

The Semantic Web

- Web Ontology Language
 - Based on Subject-Verb-Object “Triples”
 - Widely used
- Protégé tool
- Experiment: Ingest a logical data model into OWL
 - Result: a logical data model in OWL
- **Syntax is not semantics!**

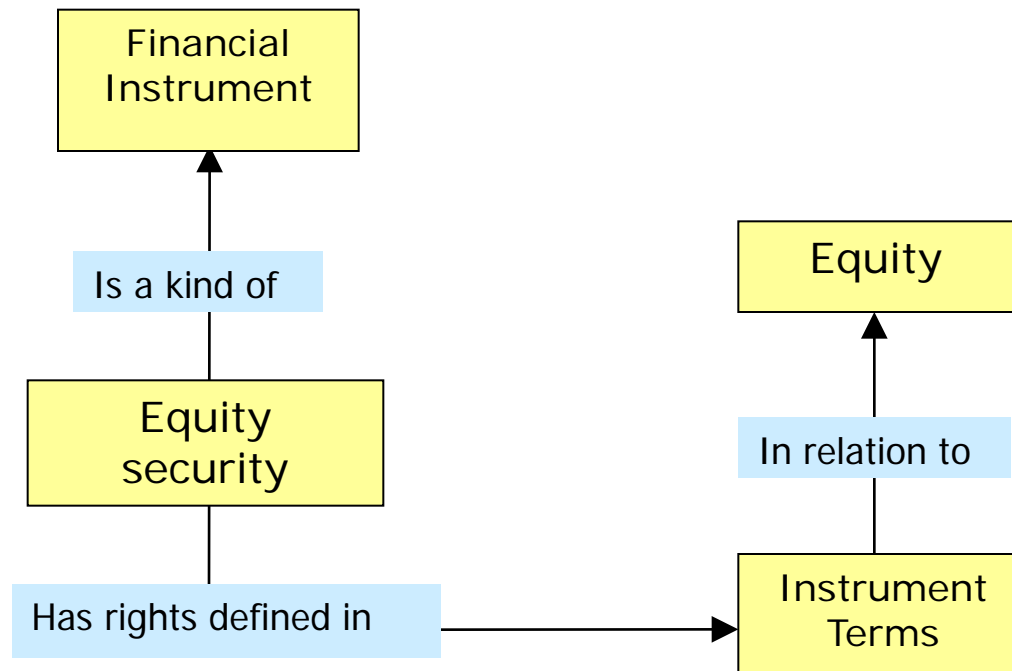
Example “Thing”: Equity

- Real world definition of Equity:

"An equity is a financial instrument setting out a number of terms which define rights and benefits to the holder in relation to their holding a portion of the equity within the issuing company".

What is an Equity?

Or to put it another way...



Lessons Learned

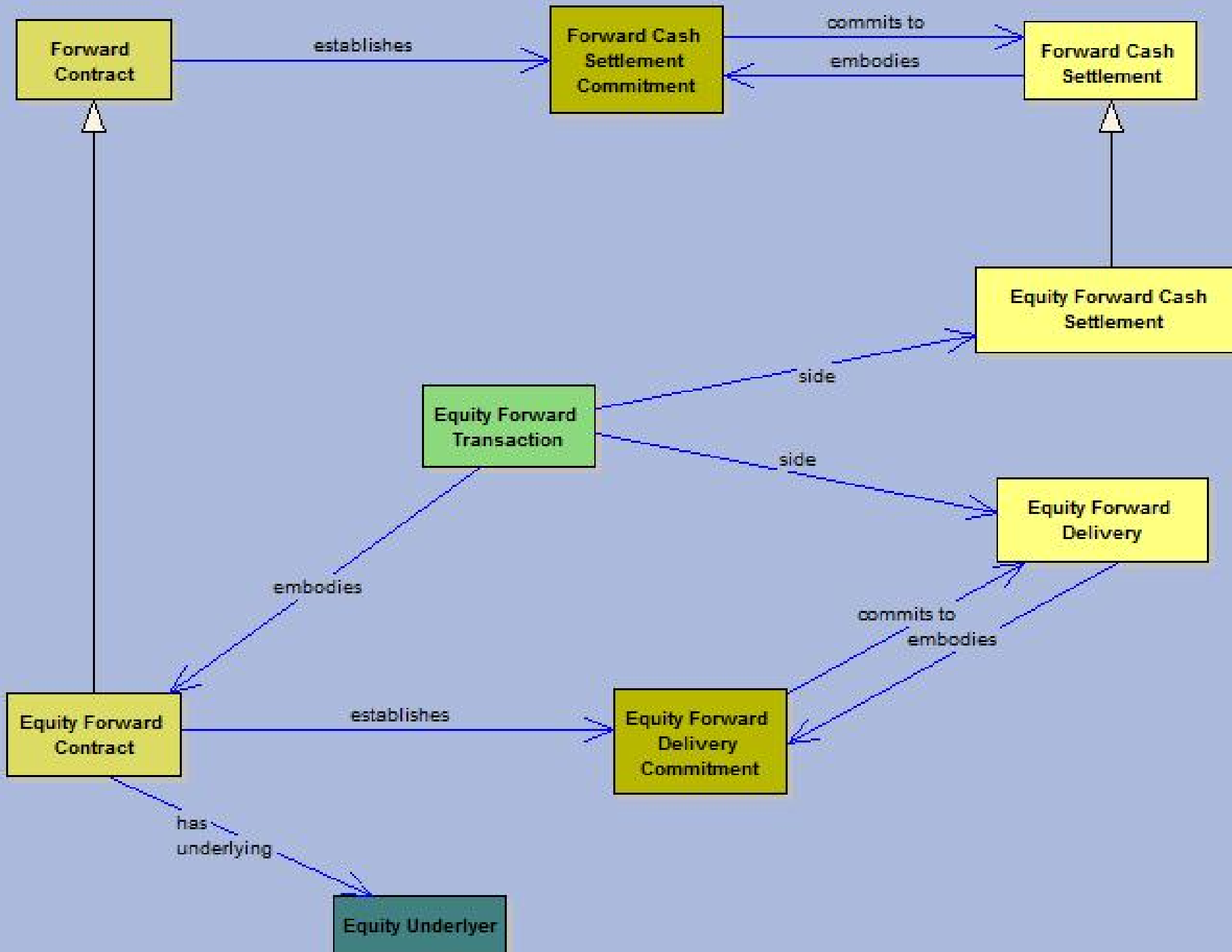
- Putting something into RDF/OWL does not make it meaningful
 - Only you can do that
- So, what is a meaningful model
 - 1. Formal relationship between model and subject matter:
 - “Everything is a Thing”
 - 2. Formal notation grounded in common logic
 - 3. Abstraction of kinds of thing into their simplest possible building blocks
 - Contracts, Parties, Legal Entities etc.

What we want

- Business meanings
- In business language
- For business people

What we want

- Business meanings
 - Not data dictionary
- In business language
 - Not a design
- For business people
 - No funny symbols and things
 - No language to learn
 - Just the facts
 - Boxes and lines – something like this...



Theory of Meaning – in English

- The model consists of:
 - Things
 - A Thing is a set theory construct
 - Arranged in a hierarchy called a “Taxonomy”
 - Like taxonomy of species
 - Facts
 - Simple facts (names, dates etc.)
 - e.g. “Issue Date” is a date
 - Relationship Facts (relate one thing to another thing)
 - e.g. “Share confers Voting Rights”
 - Things so referenced are also in taxonomic hierarchies
 - Other set theory concepts
 - Disjoints, Unions

Theory of Meaning – in English

- Taxonomy: Like Taxonomy of Species
 - Animal v Plant
 - Vertebrate v invertebrate
 - Mammals, fish etc.
- Each thing is defined by what facts distinguish it
- For each new thing:
 - What sort of thing is it?
 - What facts distinguish it from other things?
- If it walks like a duck, swims like a duck and quacks like a duck, it belongs to the set of all things that are a duck

Semantics Repository History

- Created the model Framework
 - Early draft of an OMG standard for ontology rendition in mainstream tooling
 - Ontology Definition Metamodel (ODM)
 - Configured tool to not show any design notation
 - No dots and whistles
- Reverse engineered terms from industry standards
 - i.e. “What does this term mean”
 - Definitions reframed to describe real things not data elements or “Fields”
- Subjected to business subject matter expert reviews

Semantics Repository History

- Traded Securities
 - Series of SME Reviews
 - Now in Beta
- Market Data and Analytics
 - Series of SME Reviews
 - Time component to be realigned with OMG Date/Time vocabulary

Debt Securities Deep Dive

- MBS Proof of Concept
- Extension of structured finance terms
 - MBS, ABS, CDO etc.
- Analyzed terms needed for systemic risk
 - Extensive new terms which were about loans
- Loans SME Reviews
- To do: formal alignment with MISMO

Other SME Reviews

- OTC Derivatives
 - Transaction Semantics
 - FpML Reference
- Corporate Actions
 - Defined the concepts in SWIFT MT Messages
 - Process notation required to complete
- Business Entities
 - Scope for LEI

Global Terms

- Rationale:
 - Everything is a specialization of some more general term
 - Legal, accounting, events, transaction semantics
 - Facts about instruments are stated in terms of other things
 - Countries, formulae etc.
- Want to derive from and align with the best ontologies for these area
- Disposed under a common framework
- FIBO models are extensively partitioned
- Shared Semantics:
 - Align with standard ontologies where these exist
 - Leverage OMG standards e.g. Date Time Vocabulary
- Work with academia and standards (ongoing)
 - Transaction Semantics: REA, XBRL-GL

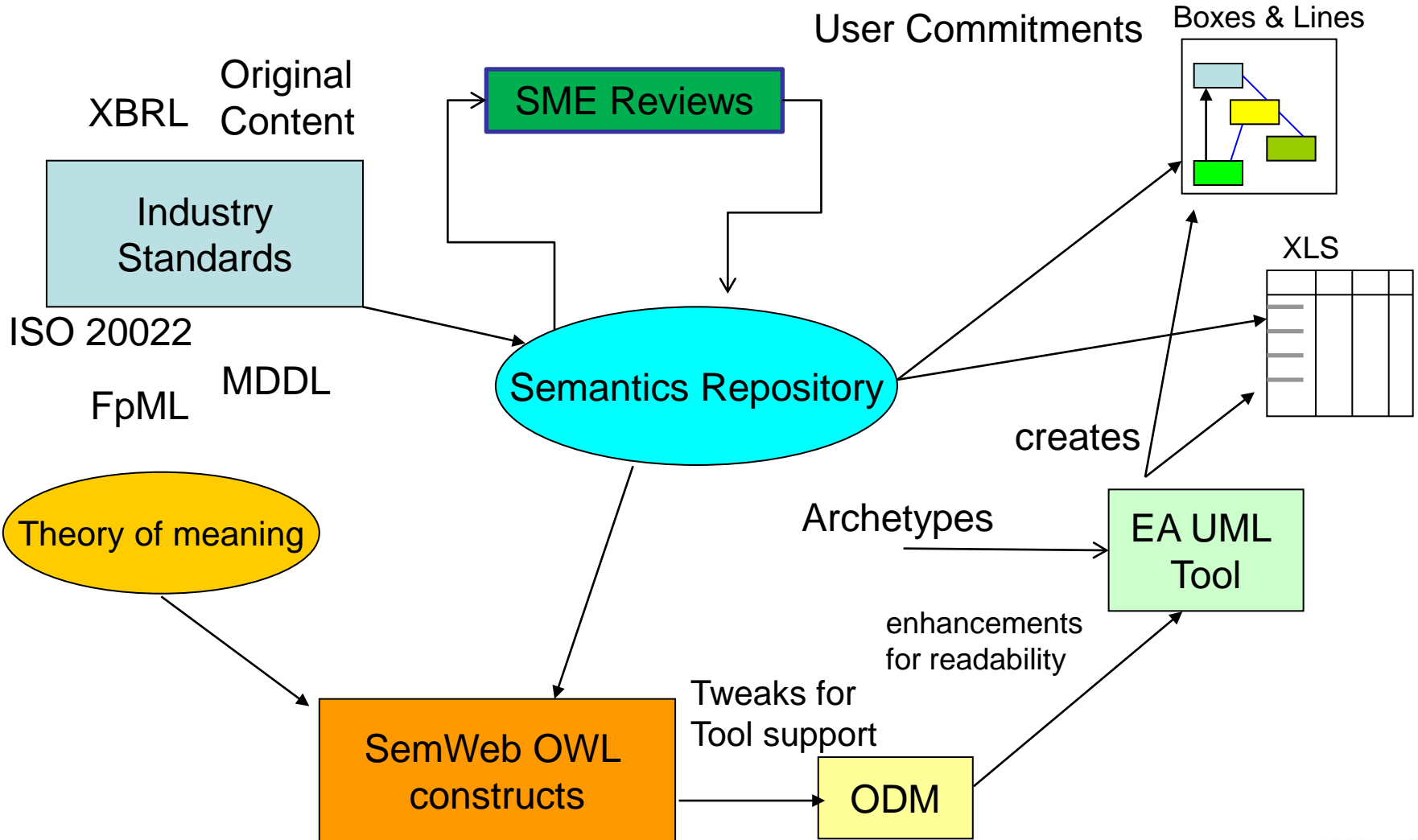
OMG Collaboration

- Formal collaborative relationship between EDM Council and OMG
- Rationale:
 - Our members want to refer to the ontology but rightly expect to see a standards governance mechanism
 - Also we had used early drafts of OMG standard for representing ontology in CASE tools
- Additional benefits
 - Availability of content in “Semantic web” format (RDF/OWL)
 - Tool-neutral machine readable serialization
 - Available in central metadata repository

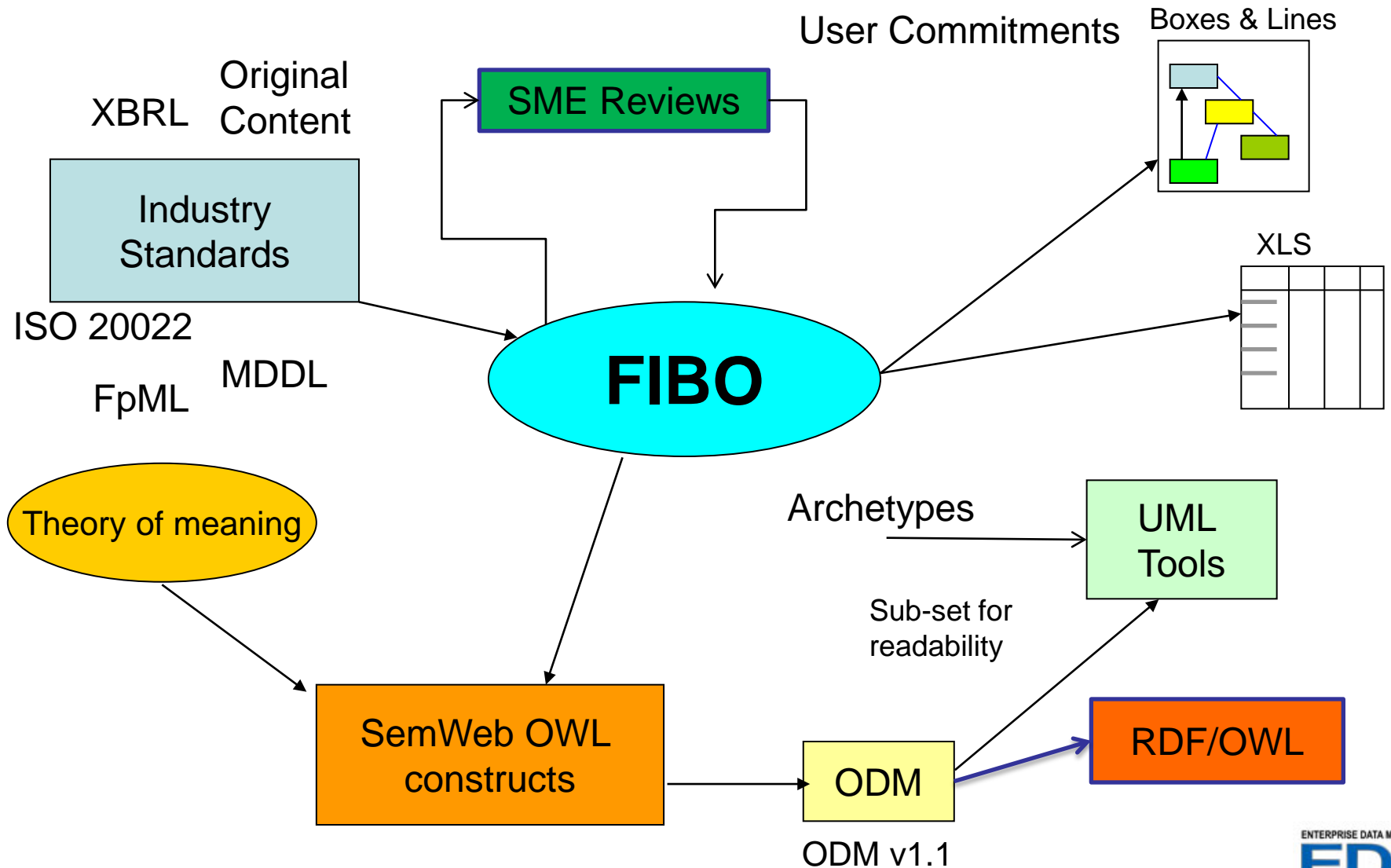
OMG Collaboration To Date

- Realigned the underlying framework in terms of the latest iteration of those OMG standards (ODM, support for OWL2)
- Formalize the “Shared Semantics” treatments
- Metadata improvements
 - Make all current model metadata available in RDF/OWL
 - Provenance etc.
 - Annotation metadata using OMG recommendations
 - Identify and implement additional metadata
- Divide the Semantics Repository content into separate FIBO standards
 - These are also further modularized so people can use the bits they need

Semantics Repository Mind Map



Financial Industry Business Ontology



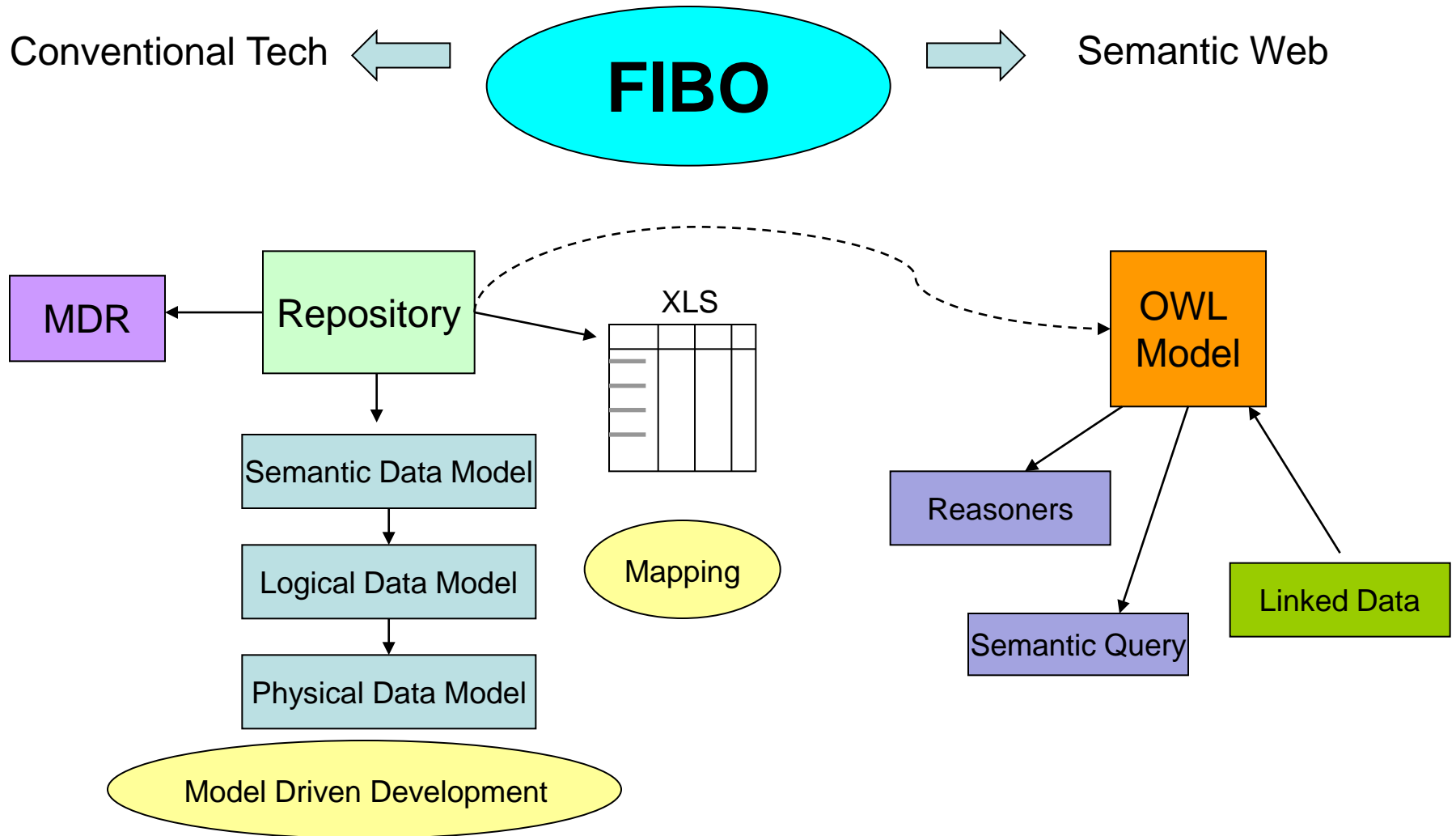
So what is FIBO

- FIBO has these distinct aspects:
 - The Business Ontology
 - Presentation for Business Readability
- Released in discrete ontologies by subject area
 - FIBO for Business Entities is currently under submission
 - Securities, Loans, Derivatives to follow
 - Corporate Actions, Transactions later
 - Leverage other OMG standards and shared semantics

Future FIBO Improvements

- Some FIBO releases will make additional use of OMG standards in process notation, business rules etc.
 - Corporate Actions
 - Transactions processing
- Improvements in transactions semantics will inform work in OTC derivatives and securities transactions
- Adoption of OMG Date/Time vocabulary will be used in refactoring time-sensitive terms (price, yield, analytics)
- Future iterations to add vocabulary (lexical) support via SBVR
- Metadata – will continue to add metadata
 - Full mappings to industry XML and UML standards
 - Cross reference to legislation and regulatory requirements

FIBO Uses



FIBO Uses

- As a common reference point
 - Mapping, integration
 - Replaces ad hoc spreadsheets with a formal project deliverable
 - Extend locally for concepts within the firm
- Model Driven Development
 - Position as “Business conceptual model”
 - Manage the “language interface” between Business and IT
- Semantic Technology applications
 - Implemented across conventional data stores
 - New application infrastructures (Triple stores)

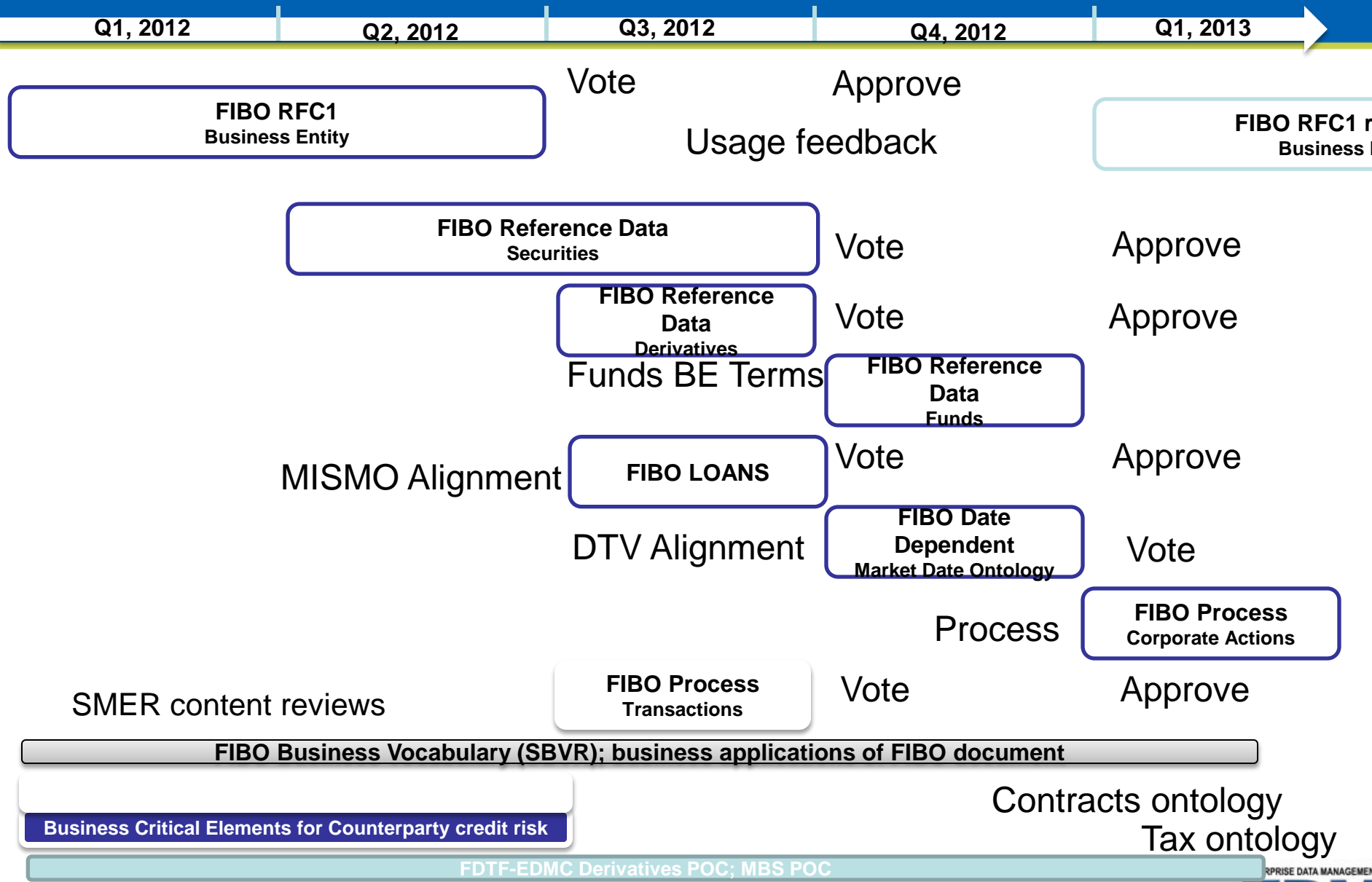
FIBO Semantic Technology Applications

- Model one get one free
 - Full and formal representation of the business facts as a common language across the enterprise
 - Rendition of this in Semantic Web format (OWL) opens the way to semantic technology applications
 - Formal reasoning across subject matter
 - Automatic classification of product types
 - Querying across subject matter
- Business Conceptual ontology (FIBO) transformed into “Operational Ontology”

FIBO and Regulatory Reform

- Identification, classification
- What regulators can do with semantic tech processing
 - Automatic classification
 - Reasoning – detect concentrations, exposures across business groups
- Reporting and Semantics
 - No changes to the message formats
 - e.g. FpML for derivatives trade confirmations
 - Data which is aligned with a common semantic model from end to end
 - Some minor changes in reporting would potentially improve regulatory processing capabilities
- The next level: institutional and system semantics

FIBO Roadmap (projected)



Main Take-away Points

- An ontology is not another sort of data model
 - It does not replace or displace messaging standards, database schemes or anything else
 - Common semantics is about the business view of what's in data
 - Enables mature approach to technology management
- Putting it in a SemWeb tool doesn't make it meaningful
 - You do
- Two ways to leverage FIBO
 - Common semantics
 - Semantic Technology applications
- Regulators and the industry are paying attention!



Certification at OMG



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Proposed FIBO Certification

- **Practitioner Certification – An Important Piece of the FIBO “Ecosystem”**
- **Currently in the earliest planning stages**
- **OMG is an experienced certification provider**
 - **Certifying practitioners of UML, SysML/MBSE, BPMN/BPM, Realtime Systems Development**
- **Our suggested program configuration, on the next slide:**



Possible Certification Structure

OMG-Certified FIBO Professional - Ontologist
OMG-OCFP-O200

OMG-Certified FIBO Professional - Analyst
OMG-OCFP-A100

- **Two-exam structure fits market needs in the simplest way**
 - Analyst level covers use with existing ontologies – the way most will use FIBO
 - Ontologist level adds ontology construction, plus advanced knowledge and skills. Analyst level is prerequisite.



FIBO Certification Benefits

- **Many Benefits Follow:**
 - Training Companies will produce and offer Courses, Books
 - Practitioners will study and certify
 - These additional practitioners support expanded use of FIBO
- **What's Next for the Program:**
 - Is the FIBO specification ready?
 - Fund exam development by pre-selling exam vouchers
 - Recruit experts to scope topical coverage and write exam questions
 - Perform psychometric validation, and publish on Pearson VUE's secure facilities



OMG's Certification Programs

- **OCSMP – SysML and MBSE:**
 - <http://www.omg.org/ocsmp/>
- **OCEB – BPM, BPMN, and related topics:**
 - <http://www.omg.org/oceb/>
- **OCUP – UML Modeling Standard:**
 - <http://www.omg.org/ocup/>
- **OCRES – Real-time and Embedded Systems Standards:**
 - <http://www.omg.org/ocres/>



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