

FIBO Shared Semantics

Ontology-based Financial Standards Thursday Nov 7th 2013

FIBO Conceptual and Operational Ontologies: Two Sides of a Coin

FIBO Business Conceptual Ontologies

- Primarily human facing
- Visual blueprint
- Standard terms and definitions for business concepts
- Broad based expressions of conceptual specifications, provenance, linkage and context of business constructs



FIBO Operational Ontologies

- Primarily machine facing (RDF/OWL)
- Derived from FIBO Conceptual Ontologies
- Optimized for performance and scalability. Fewer abstractions. Inferred relations, mappings.
- Classification, data linkage, validation and semantic query.
- Deliver executable functionality to fulfill use cases, enable data linkage, transparency and risk analytics

Introduction to Business Semantics



- OWL Thing: The ontology makes a specific commitment to being a model of things in the world
- Classes of thing are classified according to their properties
 - Additional properties
 - Restrictions on existing properties
- Classes may also be defined "extensionally" as a list of members

 Everything which may be defined falls into one of three categories:







"In context of" relationship: Context in which the Independent Thing performs the role of the "Relative Thing"



- Everything which may be defined falls into one of these three categories
- In order to complete a model of business terms and definitions, all three are needed
- This extends beyond conventional ontology applications into a full and legally nuanced conceptual ontology

Ontology Partitioning (2) Temporality



- Partitions are deliberately underspecified
- What's asserted here is that
 - **Continuant Thing:** Concept has its definition or meaning without reference to time
 - It will still of course exist over time, and have a start and an end
 - Occurrent Thing: Concept has its meaning only with relation to some temporality
 - Things which cannot meaningfully be talked about without reference to the temporal dimension
- This lets us talk about events, activities, process, state etc.



- FIBO Foundations provides the basic conceptual "Glue"
- Common abstractions grounded in law and business



- Types of corporate structure
- Organizational hierarchies / relationships

ISO 15944-4 UML Representation



Frame the REA concepts in terms of abstractions in FIBO

- Contracts, Commitments etc.

- Use the REA terms where possible
 - Forms the conceptual grounding for derivatives, securities transactions etc.
- Promote concepts from the transaction context to broader contexts where feasible

- i.e. re-using the REA terms as widely as possible

Transaction Semantics: The Basics



Transaction Sides

- Every transaction has two "Sides"
 - REA: Event
 - FpML: Swap Leg; Swapstream
 - Securities trades (FIX etc.): Delivery, Settlement
- Every Side is seen from two perspectives
 - Delivery Side:
 - Obligation to deliver
 - Right to receive
 - Payment / Settlement Side
 - Right to receive payment
 - Obligation to Pay
- How to frame these semantically?

Transaction Sides



Use of FIBO Partitions for Sides and Aspects

- Each "Event" or leg of a transaction is an independent thing
 - It is seen "in the round", in REA
 - In accounting, it is seen from the perspective of one or other party to the transaction
- The rights and obligations of each party are each a "Relative Thing"
 - Needed a word for the thing in the round, and words for the two perspectives on that thing
 - Chose "Commitment" as the thing in the round (independent thing)
 - Chose "Obligation" and "Right" for the aspects as seen by the parties (relative thing)
- Needed to frame each in terms of the other

Transaction Sides and Double Entry Book-keeping

- Each transaction event is reflected in the books of both parties
 - Party 1: Asset
 - Party 2: Liability
- The two "aspects" of the obligation are reflected in the accounts as assets or liabilities according to that party's perspective on the event
- For a transaction, each party would expect to see two such events, tied to the same transaction
- NOTE: This is NOT the same as another use of the word "Transaction" in double entry accounting
 - The ledger transaction is not a transaction as defined here
 - This is the posting of some entry
- More work required on the details of accounting
 - Intend to leverage XBRL-GL for this

REA Event Dimension

- Here we used a separate pair of partitions:
 - Continuant v Occurrent
- Framed "Event" in terms of this
 - An Event is something with a time and a place
- Also framed the concept of a Process
 - A process is a kind of Activity
 - A process has start and end, and contains events and activities
- The REA "Event" is actually a Process
 - E.g. settlement process; payment processes
 - Also the complex set of payments in a swap leg
- The FIBO Event concept also exists in REA and in ISO 16944-4, as "Business Event"

Transactions Temporality



Transactions Temporality - Detail



Agreements, Commitments and Transactions

- Not all commitments are contractual
- Not all transactions are contractual
 - REA supports internal transactions within an organization; these are not based on a contract between two separate, contractually capable entity
- Needed a complex segregation between contractual and non contractually based transactions
 - Linked the Transaction to an "Agreement" rather than a "Contract"
 - Distinguished contractual and non contractual transactions

REA Completed Model (simplified)

class REA Economic Transactions Simplified



Questions?