Documentation Workstream: Conformance Section

Thursday 26 July

# Overview

This week we discussed the changes needed to the RFC (based on the June convenience documents finance/12-06-01 and 02), focusing specifically on the Conformance material.

OMG AB review comments indicated that this section was overly complex and difficult to follow. We took as a starting point the proposals discussed at the June FDTF meeting for simplifying this material.

In the event, there is still an unavoidable requirement for some complex combination of possible conformance points, if we are to offer the possibility of a wide range of applications (conventional and semantic technology based) being able to assert conformance.

In this session the consensus of the group was that while it is possible to ignore some of the complex philosophy when deriving applications from FIBO generally, any application which asserts conformance will need to respect that philosophy.

Also discussed and resolved how to simplify the conformance section of the document so as to address the AB comments received to date.

## References

|  |  |  |
| --- | --- | --- |
| **Doc Number** | **Title** | **Filename (on Wiki)** |
| Finance/12-05-01 | FIBO Foundation | Finance-12-05-01.doc |
| Finance/12-05-04 | FIBO Business Entities | Finance-12-05-04.doc |
| Finance/12-06-01 | FIBO Foundation (convenience doc) | Finance-12-06-01.doc |
| Finance/12-06-02 | FIBO Business Entities (convenience doc) | Finance-12-06-02.doc |
| Finance/12-06-06 | FIBO Usage Scenarios | FIBO Usage Scenarios.pptx |
| Finance/12-06-07 | FIBO Release Planning | FIBO Release Planning.pptx |
| (none) | Knowledge Representation by John F Sowa | N/A |

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# Summary

## Background

Previous AB review comments on the Conformance section indicated that this was poorly structured and difficult to navigate around. This was due in part to the need to define several kinds of conformance. Prior to the May 2012 version which was commented on, we had only defined conformant extensions to the FIBO model content, and conformant expression of this content for business consumption. In May we discussed and added several additional kinds of conformance such that it might be possible for operational ontologies and conventional technology applications to claim conformance, and also to claim conformance to separate individual modules, sections or ontologies selected from the FIBO content. We had also separated the material into two specifications (Foundations and Business Entities), such that these conformance points were split across those specifications.

At the June FDTF meeting we identified a possible solution to the combinational explosion brought on by the above conformance requirements. In outline, the proposal was that any implementation in semantic web or conventional technology should be drawn from the conceptual model with extensions defined as necessary following the rules already set out for conformant extension. That is, any application should in any case be designed with reference to the FIBO content as a conceptual model (a model informing design and development of some technical artifact), and so most of the conformance requirements would be dealt with under that, existing set of conformance points. This, it was felt, should greatly simplify the conformance points needed in the specification.

## Discussions

At this week’s meeting we discussed this in detail. On a deeper look, it seems that there must still be requirements for how one extracts a set of terms from the full conceptual model, what simplifications and short cuts one can make and so on. The detailed examples we discussed at our previous sessions (e.g. not relaxing the range of a property given in FIBO, not contradicting the taxonomic hierarchy and so on) should still apply, and would not be covered by the existing conformance point for FIBO conceptual model extensions. If we are to allow a range of applications to be able to assert conformance, and if we are to allow for conformance to parts of the whole of FIBO, then some level of complexity is unavoidable.

It was resolved that the “philosophical” features of FIBO exist for a reason, and that any application which claims conformance to FIBO must respect that philosophy. It is possible to derive applications without reference to the compete FIBO philosophy, but conformance should not be claimed for these. This greatly simplifies the range of possible conformance points compared to the current draft.

We discussed two possible approaches to structuring the document to accommodate these conformance points:

1. The “Menu” approach where for each type of application, one goes straight to one document section and finds all of the material needed (this means that there is a lot of repetition as at present); or
2. An abstraction of the basic conformance requirements such that these are stated only once in the document and are then applied to each type of potentially conformant application.

# Detailed Discussion Points

The existing section on “Conformant extensions to the model content” (in FIBO Foundations) describes how to take the full, conceptual model content and extend this in a conformant way. This covers things like how to ensure that concepts which are added are meaningful, how to make use of the various existing partitions, how to ensure that concepts are adequately abstracted and so on. There are no suggestions to change this. Detailed discussion focuses on the ways in which different applications may assert conformance to FIBO.

## Cambridge FDTF Proposals

The proposal made at the June FDTF session in Cambridge, MA was to leverage the existing “Conformant FIBO Model Extensions” material, in defining conformant applications of the model content (i.e. conformant RDF/OWL operational ontologies for specific use cases; conformant conventional database applications and so on).

That is, any conformant application must make reference to an extended version of the complete FIBO conceptual model, as a starting point. This is in line with established development process in which a conceptual model should be given as a point of reference in any technology design and development.

## Questions

This still leaves the question of what makes for a conformant application of all or some part of the FIBO conceptual model. How do we make sure that applications are a true reflection of what is intended in FIBO?

### Model Content Extraction

**Question:** Would it be possible simply to define that any sub-set of the model content can be taken as it stands, and used as the basis for such an application? For example if one were to take a single taxonomic hierarchy from the multi-faceted taxonomies that are in the FIBO conceptual models and make this the basis for a database or an OWL ontology.

This would make no changes to the FIBO content but simply use a sub-set of it as it stands. For example, one might focus only on legal persons for a loan-based application (since only legal persons may incur debt), or one might focus only on formal organizations which can enter into a contractual arrangement, for securities transactions.

### Ontology Modularization

Also we have already split the content into separate modules, specifically so that people can design RDF/OWL ontology based applications which use one ontology and not another. For example, one might want to use the terms for formal organizations, but not use the terms for ownership and control relationships, these being in a separate ontology.

### Upper Ontology Lattice

One proposal which has been implemented in the production of RDF/OWL files for the FIBO conceptual model by Adaptive, was the ability to use or not use the upper ontology lattice of high level partitions (these are the “KR Lattice” terms derived from John Sowa’s “Knowledge Representation” book, giving three parallel sets of partitions under which all the remaining terms in the ontology are disposed). It was stated that people might want to use the FIBO content within their own set of upper ontology partitions. The RDF/OWL files have been delivered in such a way that it is possible to use the rest of the OWL content without this material.

The ability to do this and still claim conformance was included in the Conformance section material in the May version of the standard (and is unchanged in the June convenience version). This added a further layer of complexity to this section.

The stated reason for this requirement was that these partitions can potentially cause inconsistencies in model content. However, it should be noted that these inconsistencies are what is wanted: if any model content is inconsistent with respect to these partitions, it points to an inconsistency in the semantics of that new content. These partitions are actually how we ensure that the meanings intended for terms in the model, are respected in any extensions or applications of the model content.

It was also suggested that with the separation of the lattice material, any unexpected inconsistencies will go away. However, this is not the only place in the model where there are disjoints asserted between classes of thing. Each of the archetypal models in the Global Terms sections makes assertions about what sorts of things are intended to be mutually exclusive (OWL disjoints), with the same intent as the lattice: that the meanings we have thought about in the modeling of these archetypes, are respected in any model material which extends or makes use of these archetypes. So it is unlikely in the long term that the Lattice is the only part of the model which will cause inconvenience to anyone wanting to create model content which is inconsistent with the intended semantics of FIBO.

## Conformant Application Requirements

**Discussion point:** even if we say that an application should use terms extracted from the overall FIBO conceptual model content, don’t we still need to say something about how this can or cannot be done?

That is, the problem is not solved simply by saying that the application should be based on FIBO and/or a conformant extension of the FIBO content. We also need to still say what is a conformant way of extracting that content. So we have simplified the problem but it still exists.

So what are the do’s and don’ts?

The main thing at issue here is whether or not people who don’t like some of the underlying philosophy of FIBO can ignore it when creating simpler operational ontologies?

At one extreme, we can simply say that the only conformant applications are those which take a sub-set of the FIBO content and add nothing (or add things only in an extension to the FIBO conceptual model before extracting it).

At the other extreme, we would allow people to ignore the nuances of the FIBO model in order to create applications. Do we want these to still be able to assert conformance?

Looked at some examples – what do we mean by “the philosophy”?

Among the more philosophical aspects of FIBO, one thing which some people struggle with is the definition of certain items as “Relative Thing”, for example a Party, such as an Issuer, a Part Owner of a company, the Underwriter of a security (all capitalized items here refer to OWL classes in FIBO). Issuers, counterparties, various kinds of owner, part owner, subsidiary and so on, are all defined as kinds of “Party”, that is some entity in some role. Note that this differs from the definition of Party used in FOAF and elsewhere on the Semantic Web, but is in line with business usage of e.g. a party to a contract. The Party concept uses the “Relative Thing” partition of FIBO. So do terms like Underlying, and Reference Entity. Less obviously, we have used the concept of Relative Thing to define kinds of business entity which are defined in terms of their activities as distinct from their fundamental nature. For example, a business, a non-profit and a Special Purpose Vehicle are all things which may take several forms (a non-profit may be an Incorporated Company, it may be a Trust, and so on).

For many individual applications, being framed for just one limited use case, it may be appropriate to collapse these “relative entity” terms into a single relationship, for example between a security and the legal person which is its issuer, or between a derivative and the instrument which is its underlying. Similarly the relationships of ownership and control between business entities may be collapsed in this way.

Mostly we have already defined these “direct” relationships, but in some cases we have not. If FIBO were enhanced such that every chain of the form “Independent Thing -> Relative Thing -> Independent Thing” has also the relationship “Independent Thing -> Independent Thing” then there is no need to add these in an operational ontology, one can simply ignore the intervening relative things.

This would allow for direct extraction of a sub set of the model content, as a well-defined conformance point that would have no implications for how the existing model content is used.

## The Philosophy

**Discussion:** In general, how do we feel about people being able to assert conformance in applications which do not stick to the FIBO philosophy?

**Consensus:** We should not allow them to assert conformance. The philosophy exists for a reason and is an integral part of what FIBO is.

There may well be good reasons to design an application in RDF/OWL or as a conventional database application, which uses some elements of FIBO but which cuts across the philosophy. However, we should not allow these applications to assert conformance to the FIBO model itself.

This potentially simplifies the Conformance sections of the specification.

That is, any application should extract a sub-set of the existing material without changing any of the relationships (including disjoints). For new types of term, extensions should be made in the full FIBO conceptual modeling framework first, and then the relevant parts extracted in the same way.

# Document Structure

In accommodating so many potential conformance points, it is very difficult for reviewers to make sense of the document. This will be simplified by the decisions recorded above, however, there are still some basic principles which must apply to any conformant application, and there are several kinds of applications which may want to assert conformance to all or parts of the FIBO content.

Also the new Conformance material was written somewhat in haste, in order to fully define the range of possible conformance points.

## Possible Approaches

We could potentially try to frame the broader principles once, and then go on to describe how to interpret this for different kinds of application. Or we could list, for each application, the conformance points for that kind of application in full.

There are two possible approaches to writing a document in which different readers have different requirements (such as the conformance section where different audiences may want to implement different conformance points):

1. Something which can be read from end to end like a novel
2. Something where each user can dive into a section aimed at them, and find everything that they need.

That is, a document which can be read from end to end is not the only possible approach. In many technical documents, and particularly in technical user manuals for complex plant, it is not unusual to have similar material repeated over and over, such that each user need only read the part which is aimed at them.

This was the approach taken with the current draft Conformance section. Similar but different material was written up for each conformance point, such that for example someone wanting to create conformant RDF/OWL operational ontology would only need to read that section.

There is a table in the specification which points people to the relevant section for their conformance requirements.

However, the review comments prove that this was not very clear. It was agreed that we should write some narrative explaining the above, if we continue to structure the Conformance sections in this way.

The alternative, per option (1) above, would be to write the basic principles once only, and then have sections which expand on those principles for each kind of potentially conformant application (RDF/OWL, conventional tech, and possibly other formats as per the current draft).

## Document Structure Decisions

* Write some text explaining the Conformance section structure more clearly, such that for each kind of potentially conformant application, readers know to go to a given section and ignore the others;
* Write some text which articulates the general principles of conformant applications (these are much simpler than previously – you need to respect the FIBO philosophy and only extract what is there)
* Retain and simplify the table which indicates which sections to look at for conformance points for specific types of application

# Resolutions Summary

* Conformant applications may only use extracts of FIBO or extracts of a full conceptual ontology which extends FIBO according to the existing “Extending the FIBO Content” conformance material
* Conformant applications must respect the existing philosophy of FIBO (including the top level “Lattice” partitions)
  + Applications may be created which use FIBO but ignore these, however they cannot assert conformance
  + Applications may assert conformance if they use a sub-set of the FIBO content
* Conformant applications may be based on individual ontologies or combinations of ontologies
  + We can simplify the existing Conformance material by not talking about conformance to modules versus conformance to ontologies, and simply frame conformance in terms of using any one ontology and the ontologies this imports
  + A conformant application may use part (need not use all) of the material in any one ontology - it is not practical, in FIBO, to provide separate OWL ontologies for every conceivable sub-set of FIBO that any conformant application may use, so it is possible to use part of any ontology and be conformant
  + Conformance based on individual ontologies must include the import of all material identified by owlImports relationships INCLUDING the Lattice
* The document will describe the basic conformance requirements for applications i.e. semantic web (RDF/OWL) or conventional (RDB) implementations of the FIBO content, in terms of the general principles laid out here
* The document will provide a table linking to sections which describe the application of these principles to specific technologies, i.e. RDF/OWL and relational database technology
* The document will describe how to navigate the Conformance section up front, so that it is clear to all readers that they are not necessarily expected to read it from end to end.