ISO SC34 WG3 Reference Model Workshop

Montreal, July 31 – August 1

Notes and summary

Consolidated requirements for x models

- **Maths**
  - Appeal to an academic audience
  - Provide a (natural language) design rationale for mathematical model that relates this formal model to established topic map concepts and vocabulary
  - Enable analysis using existing mathematical formalisms/tools

- **Other IKRs**
  - Clarify the relationship to other information and knowledge representations
  - Facilitate standardized approaches to mapping between various information representations

- **TMDM**
  - Serve as a conceptual model that enables us to answer questions about the relationships between names, occurrences, associations, association roles, and scope
  - Provide a formal, mathematical model including an account of the TMDM
  - Enable us to sanity-check certain aspects of the TMDM

- **Other**
  - Provide a common foundation for TMCL and TMQL
  - Answer what it means for something to be a topic map
  - Answer what is the problem that topic maps solve
  - Facilitate disclosure of the basis of subject-centric information collation
  - Enable the modelling of and interoperation between any universes of discourse

Possible structure for deliverables

- **ISO 13250-5**
  - Concepts, vocabulary, and design rationale
  - Core model (mathematical, assertions)
  - Recommendations for mapping any IKRs (informative annex)

- **ISO 13250-2**
  - Existing TMDM
  - Mapping of TMDM to core model

TMDM

↓

Core model

↓

Concepts
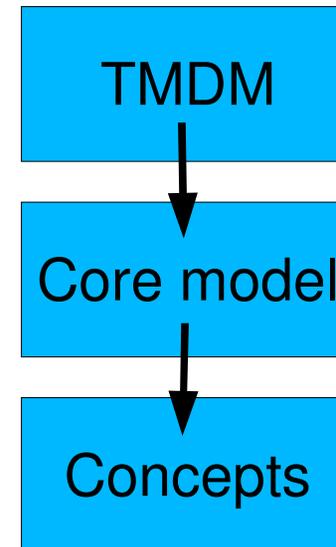
Tau – analysis in the RM vocabulary

- **The set *I* contains**
  - the set *N*, which are candidate subject proxies
  - the set *L*, which are subject proxies for the strings that they represent

- **The set *C* contains**
  - subject proxies with an SIP called *pair* that consists of the 'r' component and the 'p' component
  - the value of the 'r' component is one element of *N*
  - the value of the 'p' component is one element of *I*
  - the subject sameness detection rule is if both 'r' and 'p' is the same they have the same subject
  - to merge two of them is to select one and throw the other away

Tau – analysis in the RM vocabulary (2)

- **The set *A* contains**
  - subject proxies with a SIP *members* that consists of the set of its members
  - the subject sameness rule is if the sets are equal the As have the same subject
  - merging rule is again the same

- **The Tau model does not provide a mechanism by which elements of *N* become subject proxies**

- **The Tau model does not provide a mechanism for expressing when two elements of *N* are proxies for the same subject**

Next actions

- **Editors of part 5 to produce new draft by October 12**
  - covering concepts, vocabulary, and design rationale
- **Editors of part 5 to evaluate Tau model and comment on it**
- **Editors of TMQL to produce first working draft by October 12**
- **In both cases, circulation of interim drafts is encouraged**
- **Editors of part 2 to**
  - collaborate with OMG to make sure OMG-published model of TMDM conforms to the TMDM
  - produce proposal for how this is referenced from the TMDM document
  - propose liaison relationship with OMG Ontology SIG

Proposed draft requirements (1)

- **The RM must facilitate**
  - Disclosure of combination of labelled characteristcs of subject proxies used for determination of subject sameness
    - This implicitly discloses which subjects have proxies
  - Disclosure of labelled characteristics not used for subject identity
  - Disclosure of rules for determining subject sameness
  - Disclosure of rules for making subject proxies the same
  - Disclosure of semantics of characteristic labels and notations

- **Also,**
  - Revealing the trade-offs that were made while constructing the topic map view with regards to which subjects were reified, alluded to, and left out
  - Deterministic revelation such that for the same input to the view construction process the same view should result
  - Representation such that there is no restriction of what it is possible to create a topic map view of
  - Views which have no semantic restrictions
  - Provide a foundation for the TMDM

Proposed draft requirements (2)

- **It should be suitable as a common foundation for TMCL and TMQL**
  - it should be simpler than TMDM
  - it should be able to fully represent TMDM without loss of information
  - it should be convenient to define TMQL/TMCL on top of
- **It should be sufficiently formal to appeal to an academic audience**
- **It would be nice if it also served as a conceptual model**
- **It would be nice if it could clarify the relationship to other information and knowledge representations**

Proposed draft requirements (3)

1. **Requirements for an RM**

    1. Provide a formal (mathematical) model for subject-based information organization (call this a static topic map, & assume these maps form a set M), to include:

        1. a formal specification of a (model of) a topic map
        2. functions (such as filtering and merging) that are defined as f:M->M (or f:P(M)->M), including separate account of view-style merge
        3. other infrastructure as required to underpin TMCL and TMQL

    2. Provide a (natural language) design rationale for (1) that relates this formal model to established topic map concepts and vocabulary

2. **Success criteria for an RM**

    – it is helpful in developing TMCL and TMQL
    – it provides a design-level guidance for building interoperation between topic maps (in TAO sense) and other forms of information organization, where this is expected to be easier the more subject based those other forms are

Proposed draft requirements (4)

- **That it should (for TMDM)**
  - provide a simple, rigorous, and formal mathematical foundation for the TMDM
  - enable us to sanity-check certain aspects of the TMDM
  - enable us to answer questions about the relationships between names, occurrences, associations, and association roles
  - provide a new way to approach and understand issues such as scope
  - make topic maps amenable to the use of mathematical tools
  - be sufficiently formal to appeal to an academic audience

- **That it should (in general)**
  - provide a low-level model from which all the core models of today's information systems can be derived
  - facilitate standardized approaches to mapping between various information representations

Proposed draft requirements (5)

- **It should explain**
  - what does it mean for something to be a topic map
  - what is the problem that topic maps solve