UoM Ontology Standard OASIS TC Charter Draft

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UoM_Ontology_Standard - Proposed OASIS TC Charter - draft (228I)

Editor: HowardMason (228J)

OASIS TC Charter template - see http://www.oasis-open.org/committees/process.php for full Technical Committee process (22CN)

PLEASE NOTE THAT AREAS REQUIRING ACTION OR OTHER INPUT ARE BOLD AND SHOUTED IN CAPITALS (unless they are acronyms) *The action items will also reference a trac ticket ~~Joel* (22E5)

(1)(a) The name of the TC, such name not to have been previously used for an OASIS TC and not to include any trademarks or service marks not owned by OASIS. The proposed TC name is subject to TC Administrator approval and may not include any misleading or inappropriate names. The proposed name must specify any acronyms or abbreviations of the name that shall be used to refer to the TC. (22CV)

- Quantities and Units of Measure Ontology Standard (QUOMOS) (22CO)

(1)(b) A statement of purpose, including a definition of the problem to be solved. (22CP)

Ontologies allow the explicit specification of the multiple possible meanings of concepts so that people can recognize commonalities and differences in the semantics of the concepts that they use. (1WLU) (22E1)

Ontologies can be used to improve the quality of standards, leading to more robust implementations of the standards and the semantic integration of multiple standards. The axiomatization of formal ontologies can also support automatic conformance-checking. (22E2)

Measurement units and dimensions (or dimensionality) are essential for the meaningful communication of measurements, design specifications, scientific data, medical data, environmental data and regulations, and many commercial transactions. Confusion over measurement units can lead to disasters such as the demise of the Mars Climate Observer

satellite. An ontology of measurement units and dimensions would have wide utility in many IT standards. **(22DV)**

Measurement units include metres, feet, inches, etc. all of which have the dimension "length", i.e., length is the "property" of which "metre" is the quantum. In the metric (S.I.) system the base dimensions (units) are: mass (kg) length (metre), time (second), current (Ampere), amount of substance (mole), luminous intensity (candela), and temperature (Kelvin). Derived (or composite) dimensions are constructed by multiplying or dividing the dimensions when multiplying or dividing the corresponding quantities. Hence speed has dimension of length / time. In practice the various base dimensions may have exponents of -3 to +3. Thus the space of derived dimensions has size of 7 to the 7th power - approx. 800K possible dimensions. For each dimension there are often serveral alternative measurement units - thus the space of all possible measurement units is huge. **(22DW)**

Thus is it is clear that there is need to specify a framework for constructing derived dimensions / units from base dimensions and units. **(22E3)**

It is therefore proposed to develop an ontology which would specify (at least) the various base dimensions and units of the SI (metric) system, the various metric scale factors (nano-, micro-, milli-, kilo-, …), the rules for constructing various derived units, and the designations of the most common derived units such as joules, watts, … The ontology should also address a small number of non-metric base units, e.g., inch, foot, pound, and some of the more popular derived units, e.g, quart, cup. **(22E4)**

The ontology will be represented in multiple formats, to allow exploitation via various tools - CLIF is currently proposed as the reference normative form, with OWL 2.0 DL as an equivalent normative form. It will also be important to construct canonical URIs to reference the various measurement units and dimensions. Furthermore, the ontology should be linked to standard representations (names, abbreviations) for the various measurement units / dimensions, e.g., meters, m, joules, etc. **(22DX)**

There are some anomalies which need to be addressed, mostly notably having to do with the measurement of concentrations. In the S.I. system concentrations are to be recorded as moles / cubic meter, or more commonly, as moles / Liter, i.e., molarity. However, we often see concentration measurements expressed as ratios, e.g., percent solutions or parts per million. However, such concentration ratios may either be mass ratios, mole ratios, volume ratios (for solutions), or partial pressure ratios (for gases). Although all of these concentration ratios appear to be dimensionless, they are not comparable, and conversions among them (or to/from molarity) are both material dependent and state dependent, e.g., temperature and pressure. **(22DY)**

Another anomaly concerns the dimensionality of work (energy) and

torque, both of which have units of Newton * meters. In the case of work, we are computing the dot product of the force vector and the direction of travel. In the case of torque are computing the cross product of force and distance. (22DZ)

(1)(c) The scope of the work of the TC, which must be germane to the mission of OASIS, and which includes a definition of what is and what is not the work of the TC, and how it can be determined when the work of the TC has been completed. The scope may reference a specific contribution of existing work as a starting point, but other contributions may be made by TC Members on or after the first meeting of the TC. Such other contributions shall be considered by the TC Members on an equal basis to improve the original starting point contribution. (22CQ)

The objective is to develop the draft of an international ontology standard for "Units of Measure and Quantities" which will be publicly available, free of charge. The reference normative form of the ontology will be expressed in the CLIF language, with normative forms in OWL 2.0 DL, and UML. (22DS)

The work shall include the development of a federated integrated ontology which represents fundamental and derived units of measure and their relationships, independent of industry sector and applications, based on available specifications and standards. Where ambiguities and contradictions arise, these shall be referred back to the originating organizations for resolution. (22DT)

The scope of units to be addressed will include the work of BIPM (International Bureau of Weights and Measures), ISO/IEC 80000, VIM (International Vocabulary of Metrology), UnitsML, UCUM (Unified Code for Units of Measure) and UNECE Recommendation 20 taking into account ontologies such as Sweet, QUDT and the QUDV component of SysML. (22DU)

(1)(d) A list of deliverables, with projected completion dates. (22CW)

The TC will produce a core set of ontology modules covering quantities, units, scales, dimensions, base and derived SI units and extension mechanisms to allow the later inclusion of non SI units and other measurement systems. The reference normative ontology will be expressed in CLIF, with other normative expressions in OWL 2.0 DL, and supported by equivalent UML diagrams. (23EA)

Further extensions may be generated using the specified mechanisms. (23ED)

(1)(e) Specification of the IPR Mode under which the TC will operate. (22CX)

- Non-Assertion (22DP)

Note: Requires all Obligated Parties to provide an OASIS Non-Assertion Covenant as described in Section 10.3 of the OASIS IPR Policy - Non-

Assertion Mode TC Requirements   (22DL)

10.3.1. For an OASIS Final Deliverable developed by a Non-Assertion Mode TC, each Obligated Party in such TC hereby makes the following world-wide "OASIS Non-Assertion Covenant".   (22DM)

-- Each Obligated Party in a Non-Assertion Mode TC irrevocably covenants that, subject to Section 10.3.2 and Section 11 of the OASIS IPR Policy, it will not assert any of its Essential Claims covered by its Contribution Obligations or Participation Obligations against any OASIS Party or third party for making, having made, using, marketing, importing, offering to sell, selling, and otherwise distributing Covered Products that implement an OASIS Final Deliverable developed by that TC.   (22DQ)

10.3.2. The covenant described in Section 10.3.1 may be suspended or revoked by the Obligated Party with respect to any OASIS Party or third party if that OASIS Party or third party asserts an Essential Claim in a suit first brought against, or attempts in writing to assert an Essential Claim against, a Beneficiary with respect to a Covered Product that implements the same OASIS Final Deliverable.   (22DN)

(1)(f) The anticipated audience or users of the work.   (22CY)

The proposed ontology will be applicable to any developer or user of information models or applications that require an unambiguous definition of units in a digital form that can be utilised by a wide range of applications, including document markup and data exchange. It will also highlight logical inconsistencies and ambiguities that need to be addressed.   (22E7)

(1)(g) The language in which the TC shall conduct business.   (22CZ)

- English   (22DO)

(2) Non-normative information regarding the startup of the TC, which includes: (22D0)

(2)(a) Identification of similar or applicable work that is being done in other OASIS TCs or by other organizations, why there is a need for another effort in this area and how this proposed TC will be different, and what level of liaison will be pursued with these other organizations.   (22D1)

The only relevant work in OASIS is the UnitsML activity to provide a markup language for units. The QUOMOS work should be complementary, in providing an ontological representation for Units of Measure, and may provide resolution of ambiguities in the definition of units adopted from elsewhere.   (22E8)

The work needs to be based on the fundamental internationally agreed definitions from BIPM and the agreed understanding of derived units, as defined in the ISO/IEC 80000 series of standards. Additional derived

units from efforts such as UCUM and known requirements from other groups may also be taken into account. Existing agreements on international trade from the UN should also be taken into consideration. (22E9)

Requirements are being actively sought from prospective user organisations in ISO, IEC and UNECE, and the TC welcomes other relevant contributions. (22EA)

In order to obtain the broadest possible perspective, the initiative has been reported to the Management Group of the MoU on eBusiness between ISO/IEC/ITU/UNECE, at its 12-13 October meeting, with a request for contributions. (22EB)

(2)(b) The date, time, and location of the first meeting, whether it will be held in person or by telephone, and who will sponsor this first meeting. The first meeting of a TC shall occur no less than 30 days after the announcement of its formation in the case of a meeting held exclusively by telephone or other electronic means, and no less than 45 days after the announcement of its formation in the case of a meeting held face-to-face (whether or not a telephone bridge is also available). (22D2)

The first meeting will be held by teleconference on Friday 15 January 2010, from 15.00-17.00 UTC (23EE)

(2)(c) The projected on-going meeting schedule for the year following the formation of the TC, or until the projected date of the final deliverable, whichever comes first, and who will be expected to sponsor these meetings. (22D3)

The TC will meet by teleconference every two weeks or as decided by the group after it is launched. Additional face-to-face meetings may be held by consensus. (23EF)

(2)(d) The names, electronic mail addresses, and membership affiliations of at least Minimum Membership who support this proposal and are committed to the Charter and projected meeting schedule. (22D4)

ACTION: Need to find supporters from the OASIS sponsors and contributors list - see http://www.oasis-open.org/about/index.php for list trac (22DC)

List suggested at meeting - to be confirmed by individuals by November 16 (23EG)

- NIST - Ed Barkmeyer (23EH)
- NASA JPL - (23EI)
- Eurostep - David Price (23EJ)
- Carnegie Mellon University (23EK)
- DISA - Jerry Smith (23EL)
- LBNL - Frank Olken (23EM)

- Peter Yim   (23EN)

Note: "Minimum Membership" means five Voting Members of a TC (or, in the case of a TC about to be formed, five Eligible Persons), at least two of which represent OASIS Organizational Members.   (22DD)

(2)(e) For each OASIS Organizational Member listed in (2)(d), the name, electronic mail address, membership affiliation, and statement of support for the proposed Charter from the Primary Representative.   (22D5)

ACTION: Needs to be filled in based on 2(d) [trac](#)   (22DE)

Note: "Primary Representative", for any OASIS Organizational Member, means the person or persons designated by that Member to serve as the consortium's principal contact for administrative issues.   (22DF)

(2)(f) The name of the Convener who must be an Eligible Person.   (22D6)

- [HowardMason](#) (BAE Systems)   (23EB)

(2)(g) The name of the Member Section with which the TC intends to affiliate, if any.   (22D7)

- None   (22DI)

(2)(h) Optionally, a list of contributions of existing technical work that the proposers anticipate will be made to this TC.   (22D8)

- BIPM (International Bureau of Weights and Measures)   (22EC)

- VIM (international Vocabulary for Measurement)   (22EE)

- [UnitsML](#)   (22EF)

- UCUM (Unified Code for Units of Measure)   (22EG)

- Sweet   (22EI)

- QUDT   (22EJ)

- QUDV component of [SysML](#)   (23EC)

(2)(i) Optionally, a draft Frequently Asked Questions (FAQ) document regarding the planned scope of the TC, for posting on the TC's website.   (22D9)

- None   (22DJ)

(2)(j) Optionally, a proposed working title and acronym for the specification(s) to be developed by the TC.   (228K)

- Quantities and Units of Measure Ontology Standard (QUOMOS)

(22DR)

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(22DR)