Scope of the Units of Measure Ontology

Ed Barkmeyer
NIST
Scope issues

- units only, or quantities and units models
- specific named units: SI-only, metric-only
- derivation
- conversion
- scales
- measurement and uncertainty
- specification and tolerance
- modules, microtheories, priorities
- other standards
Quantities model

- Do we need a model of Quantity for units?
- Quantities that are not scalar?
- “particular quantity” and/or “abstract quantity” or “quantity magnitude”?
  - which is ‘quantity’?
Dimensions

• ‘quantity kind’/’dimension’?
• ‘system of quantities’?
  – ‘base quantity’, ‘derived quantity’
  – SI only?
• Explicit model of the SI base quantities
  – Length, mass, time, temperature, current, …
• Derivations of derived quantities?
  – dimension expressions
Explicit units

• Which explicit units?
  – metre, gram, second, ampere, etc.
  – metric prefixes
• Which explicit derived units?
• library of derived units?
  – Maintenance agency v. registration authority
    Controlled or just registration rules
  – UCUM, UnitsML
  – Published extensions
• Unit derivations?
Quantity Scales

- Does the ontology cover quantity scales?
- Ratio scales (length, time, etc.)
- Absolute scales (mass, temperature, etc.)
- Non-linear scales (logarithmic, other?)
- Reference scales (hardness, etc.)
Unit Conversions

- Does the ontology model unit conversions?
Measurement and Uncertainty

- Do we model particular quantities and measurements?
- How much of measurement?
  - nominal values
  - uncertainties
  - conditions and equipment
- How much of uncertainty?
Specification and tolerance

• Do we model quantity specifications?
• Do we model tolerances?
• How much of specification and tolerance
Modularization

• Should we divide the ontology into modules?
  – quantities, systems, units, scales?

• Explicit microtheories
  – for specification and tolerance
  – for measurement and uncertainty
  – other?

• Prioritization of deliverables

• Published extensions
Other Standards

• Relationship to other standards efforts
  – UCUM
  – UnitsML
  – Other”
Other

- ?