Seeking greater rigour in text-based standards

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Background

- CEN TC310 WG1 – works on standards for manufacturing enterprise architecture and related things; has a European motivation, e.g. picking up FP6, FP7 results (CIMOSA, ATHENA, INTEROP,…)
- *Completed standards on enterprise modelling (framework EN/IS 19439, constructs EN/IS 19440),*
- *Currently working on 'requirements for manufacturing enterprise process interoperability' (MEPI)*
- Making contributions to and participating in corresponding ISO work (especially ISO TC184 SC5 WG1)
- *Active work item is 'reference-base for enterprise architectures and models' (revision and consolidation of IS15704 and IS14258)*

What form do our standards take?

- Standards need to constrain to be useful
- Normative text as per ISO rules (“shall” etc)
- Other normative elements (formulae, syntax definitions, templates, flow diagrams)
- Recent progress on accepting ‘standards as databases’ (ISO TC184 SC4 STEP)
- “Figures are always illustrative”, but…
- Some progress in arguing that computer-generated figures are like flowcharts (so don’t need redrawing – but still not acceptable as normative elements)
- Why? Shortcomings of tool or modelling language? Insufficient verification? Lack of expertise? Inertia? No ontological underpinnings?

What we've done

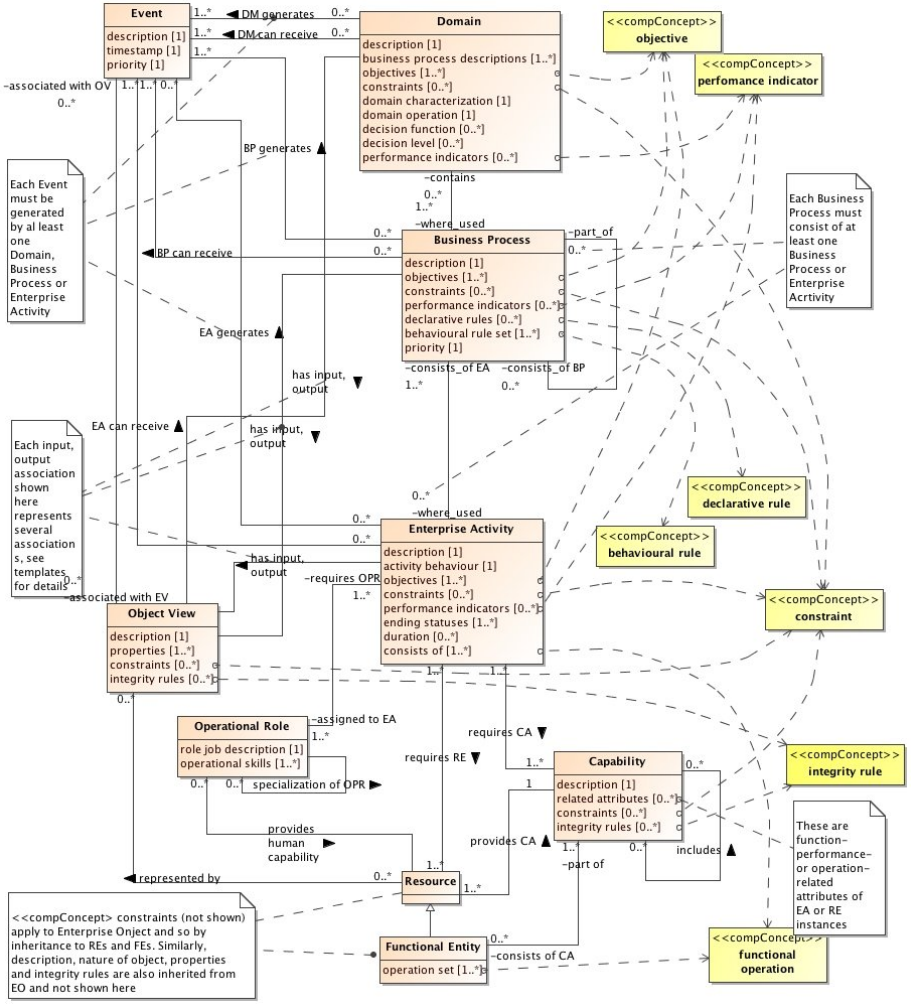
- Used computer-assisted concordance checking; reduces synonyms and usage conflicts. Effective for small groups (2-3 people?)
- Concept maps, e.g. collaborative use of CMAP (helping w. initial consensus on key concepts)
- Facilitated sessions w. ontology perspective (ISO 184/5/1 and ISO JTC1 SC5 WG42) – exposed issues, but limited concrete outcomes (just 2 definitions?)
- computer-assisted conceptual modelling w. an underlying single UML model and different views thereupon; provides greater consistency of relationships between conceptual elements and of Figures w. the normative text and templates [actually the Figures have the most rigour…]

Example – 19440 Constructs

- a single ‘über model’
- diferent views on that corr. to function, information, resource, organization views (as per IS 19439)
- main concepts are modelled as classes
- relationships labelled
- attributes inserted as per templates
- textual annotations for some constraints
- complemented by behavioral rules defined in eBNF
- diagrams in ‘informative’ annex

– also used the UML model to map POP* and ODP concepts

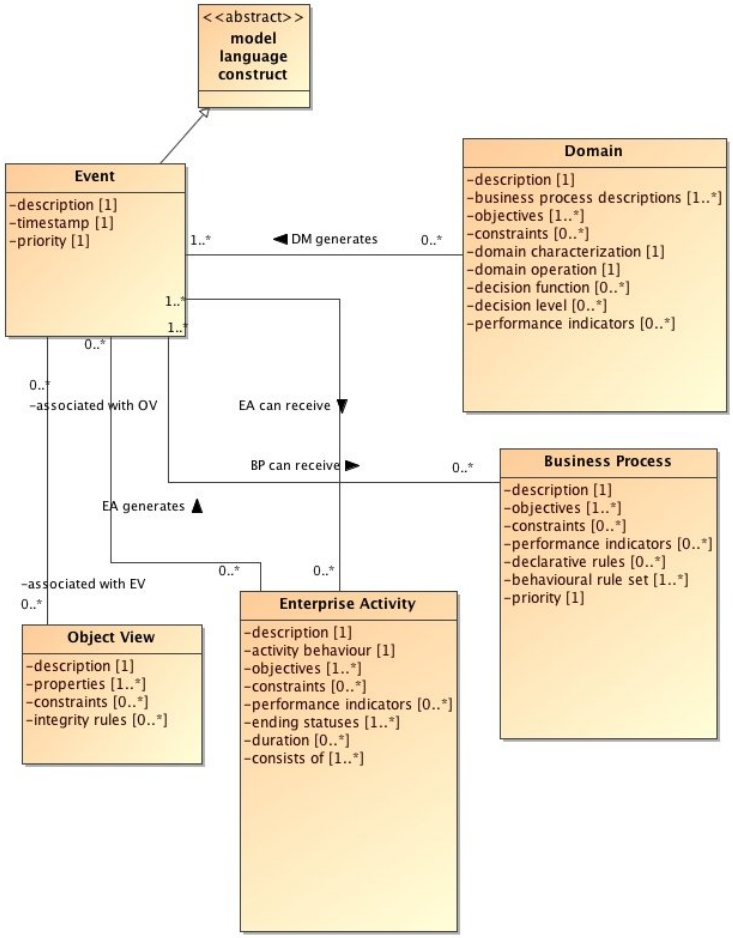
Function view on the constructs:



Checking consistency, e.g. for Event

- create a blank diagram
- add the 'Event' to that diagram
- use the tool to show related elements (automatically)
- manually check those relationships against the text and the templates
- edit and iterate accordingly …

Note – this is a single person activity, difficult for others to participate…



What next?

- Would it be worthwhile and feasible to develop the UML model for constructs into some form of frame-based ontology?
  - what leverage would that give us as standards-makers? What benefit to users? And which users – tool-makers, enterprise architects …?
  - what would be the easiest way for non-ontology specialists to do that? Protegé?
- If successful and useful, how should the result be published as a ‘standard’?
  - and how can we do that within the CEN/ISO directives?