Attendees

- Pieter Pauwels [Ghent University]
- Kris McGlinn [TCD-Adapt]
- Nicolas Bus [CSTB]
- Maxime Lefrançois [EMSE]
- Ana Roxin [U. Burgundy]
- Michel Bohms [TNO]
- Claudio Mirarchi [Polimi]
- Emilio Sanfilippo [LOA]
- Gonçal Costa [LaSalle University]
- Walter Terkaj [ITIA-CNR]
- Kyriakos Katsigarakis [TUC]
- Georgios Lilis [TUC]
- Odilo Schoch [ETHZ]
- Anna Wagner [TU Darmstadt]

Excused

- Aaron Costin [University Florida]
- Victor Malvar [neanex]

Date and time

- 25/09/2017
- 17:00 CEST

Agenda

1. Properties for product data (Maxime)
2. Review of open issues in Git repos and Working Group documents (Pieter)
3. Evaluation of the Community Group activities (Pieter)

Minutes

1. Properties for product data (Maxime)

Maxime reports on ongoing work to build a PROPS ontology, namely an ontology that captures a large set of product data properties. This work is done in collaboration with the CSTB France.

Goals: (1) how to model Properties and (2) how to simplify ifcOWL

Notes of this ongoing work are maintained in:
https://github.com/w3c-lbd-cg/props/blob/master/notes.md

A new repo has been set up to capture an ontology with properties for products:
https://github.com/w3c-lbd-cg/props

The PROPS ontology is generated from the set of PSet XMLs that is made available by buildingSMART as part of the IFC standard (extracts below). The ontology is generated using SPARQL Generate, software developed by Maxime. Advantages of SPARQL Generate are: the corresponding Java class is very concise, the overall process is very fast, also very easy to understand the syntax for people who know SPARQL.

```
<?xml version="1.0"?>
<PropertySetDef xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http
  <Name>Pset_ActionRequest</Name>
  <Definition>An action request is a request for an action to fulfill a need.  HISTOR
  <IfcVersion version="2x4" />
  <ApplicableClasses>
    <ClassName>IfcActionRequest</ClassName>
  </ApplicableClasses>
  <ApplicableTypeValue>IfcActionRequest</ApplicableTypeValue>
  <PropertyDefs>
    <PropertyDef ifdguid="e098e980d1bc11e1800000215ad4efdf">
      <Name>RequestSourceLabel</Name>
      <Definition>A specific name or label that further qualifies the identity of a r
      <PropertyType>
        <TypePropertySingleValue>
          <DataType type="IfcLabel" />
        </TypePropertySingleValue>
      </PropertyType>
      <NameAliases>
        <NameAlias lang="ja-JP">要請ソースタイプ</NameAlias>
      </NameAliases>
      <DefinitionAliases>
        <DefinitionAlias lang="ja-JP">要請がなされる源のあらかじめ定義されたタイプの識別子。</Defini
      </DefinitionAliases>
    </PropertyDef>
    <PropertyDef ifdguid="eabae800d1bc11e1800000215ad4efdf">
      <Name>RequestSourceName</Name>
      <Definition>The person making the request, where known.</Definition>
      <PropertyType>
        <TypePropertyReferenceValue reftype="">
          <DataType type="IfcPerson" />
        </TypePropertyReferenceValue>
      </PropertyType>
```

The output from this generation process is an ontology: ifc#Output containing the output of parsing all of the Psets (~400) in XML, transforming them in RDF and then joining them in one file.

The file notes.md summarizes all decisions regarding the above mentioned goals. Some are repeated below:

- Issue: what if a property can be applied in another context than the one initially defined for it e.g. AtmosphericPressure
    - We avoided using rdfs:domain and rdfs:range because properties would otherwise end up having multiple rdfs:domains (unionOf) or have difficult naming conventions.
    - Instead, we use the term schema:domainIncludes from Schema.org
- Some properties and property sets are associated with IfcBase/ENUM domains (e.g. IfcCovering/FLOORING) => this can be translated in various ways. At the moment, we followed the following URI structure: IfcCovering/FLOORING (“/” becomes “%2F”) ?
- Fixing of some identified issues: empty spaces, empty class names, etc.
- Mapping to the BOT and PRODUCT ontology is possible using the ApplicableClasses (IfcSpace, IfcZone, IfcSpatialZone => bot:Space & bot:Zone). This would also allow to map to ifcOWL, although that is currently not the primary goal.
- Measurements are also included in the ranges of the properties. These come from the IfcMeasurementResource module in IFC.

- => perhaps replace with QUDT, OM, …?
- => Michel: note that this can be modelled in different ways (ontology modelling patterns -> which one to use)

Open questions:

- Why redefine new types for measures (a datatype prop points to a new datatype defined for the considered measure) ? Could we map to other existing vocabularies e.g. qudt/OM2.0
- What about enumerations ? Is the “UNKOWN” value really used ?
- Pieter: for content like products, measurements, data types, and similar, the idea is not to completely follow the original, which comes from IFC. Instead, the purpose should be to apply best modelling practices from the Semantic Web / Linked Data area. Measurements and data types have been modelled before in other ontologies available in the W3C environment.
- Michel: should we propose this approach for integrating / adapting properties from outside IFC ?
    - Maxime: we could use custom mapping for adapting the approach for other domains, but this would be manual. It could also be possible to use templates. If we adapt the approach with qudt, the rdfs:range value would be more complex, but the property could remain as a datatype prop. By defining a custom datatype, the drawback is that it can be ignored by an OWL reasoner. Still, we might not need to reason over such values, but just apply some operations/tests on them.
- Walter: the definition of time series should be well studied. The time series used in the Psets are linked to “history” of the element. It does not carry very much semantics / meaning. We might want to apply an approach such as the one applied for SSN Observation instead.
    - Maxime: We aren’t sure that dealing with time series is in the scope of this group. Perhaps in IFC the time series are more complex than just aggregating several observations (as in SSN). But definitely, this has to be discussed, there are not many approaches for modelling such information.
    - Approach from Kyriakos: http://iot.ee.surrey.ac.uk/citypulse/ontologies/sao/sao
- Walter: hypothesis - “in some Psets, the same property name is used. We deal with that by modifying the domain, using schema:domainIncludes. “ Question: is this really true ?

Do we really have different properties with different names ? Don't they potentially have the same meaning?

- Yes, we have different properties with the same names. They are included using schema:domainIncludes. Note, however, that these properties with the same name have different meanings! So, indeed, a qualitative evaluation should be done!

  Example: Props:capacity has two definitions which are entirely different:

  - "The product of the ideal capacity and the overall volumetric efficiency of the compressor"
  - "Cooling tower capacity in terms of heat transfer rate of the cooling tower between air stream and water stream"

- Michel: why using schema:domainIncludes ? Are we sure it "works" as we want ?
  - Maxime: yes, it's the approach used by SSN, but carries little if no semantics.
  - Michel: then it's like a "light" link, it may not be necessary to specify this, and leave it open "the property could be used for other classes".
  - Maxime: we could define a superclass for the ensemble of classes to which this property is pertaining (e.g. as done for bot:Zone)
  - Pieter: furthermore, these IFC-originating domains (applicableClasses) are okay as a reference, but we should connect the resulting ontology to BOT and Product and similar (W3C).
- Walter: okay to reuse Psets, not necessarily a good idea to give feedback to IFC for modifying names etc. It should not be the main purpose. Let us focus on representing the data.
- Pieter: indeed, we have been communicating with IFC/bSI, but it is very difficult to get content across. It should indeed be done, but we should more importantly go for the extra mile, see what the industry needs, and make that happen.
- Maxime: We should also use best practices from the OWL community (e.g. HorizontalCable should be a class instead of having a datatype prop isHorizontalCable with a boolean value).
- Pieter: All of this information (ontologies and examples) is managed through GitHub. for improving this effort, please use the available GIT functionality (issues, branches, …).
- Maxime: anyone who wants to join, please communicate. There is access to the repo.
- Pieter: These PSets are also very much constrained or inspired by the way in which "types" are modelled in IFC (see image below). Modeling constraints between

IfcProduct, IfcTypeProduct and IfcPreDefinedPropertySet in IFC. This is very uncommon is a semantic web environment, so strong care should be maintained when it comes to including such “type” information in the PROPS ontology.

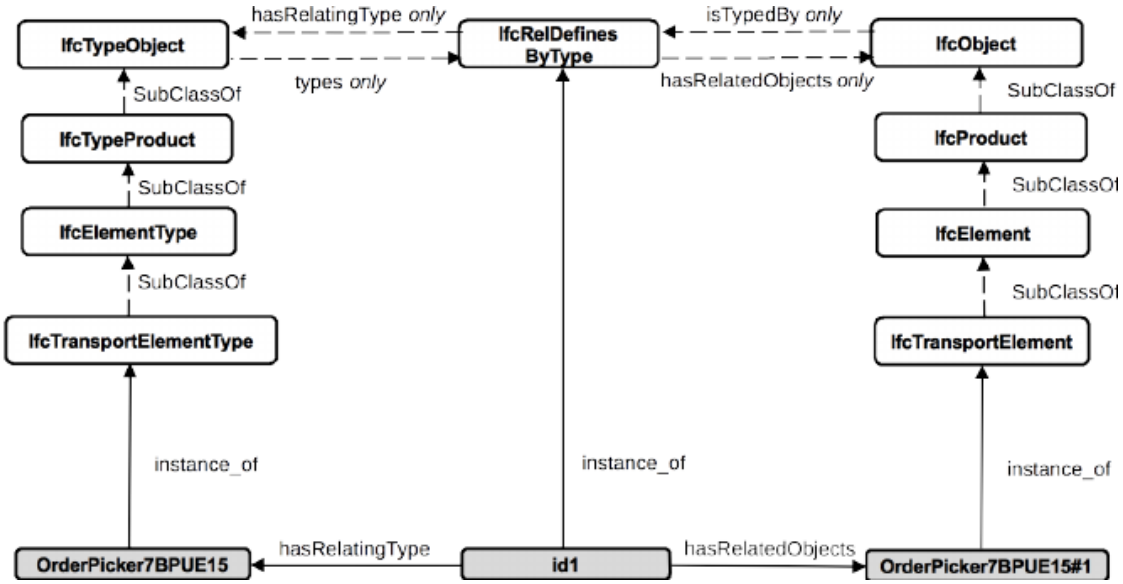


Image from: S. Borgo et al. Ontological Analysis and Engineering Standards: An Initial Study of IFC. DOI: https://link.springer.com/chapter/10.1007%2F978-3-319-15326-1_2 (Also available on ResearchGate: https://www.researchgate.net/publication/276275577_Ontological_Analysis_and_Engineering_Standards_An_Initial_Study_of_IFC)

Terkaj W, Sojic A (2015) Ontology-based Representation of IFC EXPRESS rules: an enhancement of the ifcOWL ontology. Automation in Construction, 57:188-201. ISSN: 0007-8506. doi:10.1016/j.autcon.2015.04.010 (ResearchGate: https://www.researchgate.net/publication/277785065_Ontology-based_representation_of_IFC_EXPRESS_rules_An_enhancement_of_the_ifcOWL_ontology)

2. Review of open issues in Git repos and Working Group documents (Pieter)

Postponed to next meeting.

3. Evaluation of the Community Group activities (Pieter)

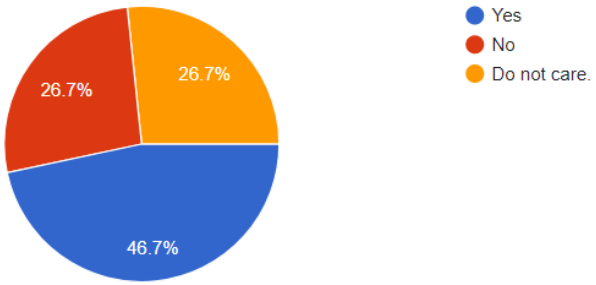
An evaluation was done of our activities as a community group. Results are listed below. This is very important information in our decision to have a meeting in TPAC San Francisco

(https://www.w3.org/2017/11/TPAC/); to transform to a WG; and to simply act better in every single step that we take as a group.

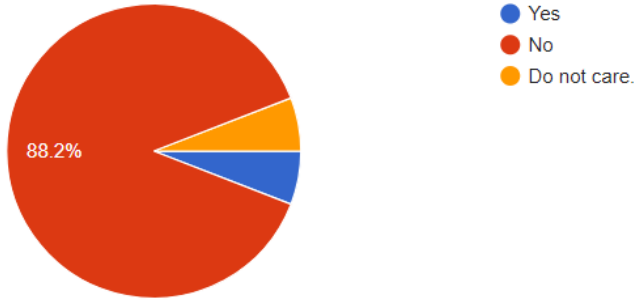
Mainly: if we go as a WG, we have a 2 years deadline for delivering our results. We would also need to pay some fees to the W3C (not necessary as individuals, but our respective organizations). We already built a "Community" so perhaps it's a good idea to stay as such for another year.

Poll / Survey:
https://docs.google.com/forms/d/1FKM-g3JncER42iXIDDOIdwuFn3Br1mbQGh7_3mrXY8c/edit

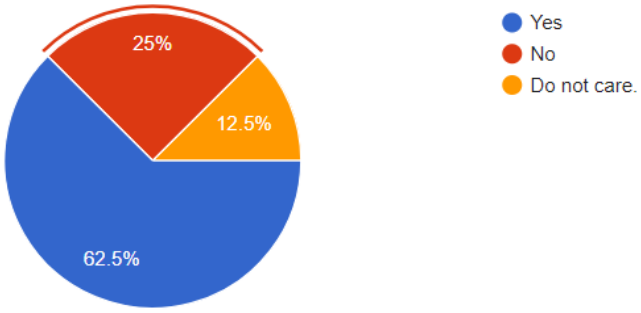
1. Should we organise a W3C LBD Community Group meeting at TPAC California?



2. Will you attend the LBD CG meeting at TPAC, IF it takes place?



3. Should we transform the Community Group into a Working Group?



4. Do you have particular recommendations and/or suggestions regarding the Working Group charter at https://w3c-lbd-cg.github.io/lbd/charter/?

- I think we are not yet there and should keep being a CG for at least one more year.
  charter ok, mention SEAS ?
- The projected deliveries for March 2020 are all ontology related... does the working group have the capacity and number of members with domain expertise to do all of these tasks justice? It just seems like a very optimistic goal... For example accurate alignment is not an easy task... it needs to be peer reviewed, etc.
- In terms of the first two deliverables in Section 3.3 (i.e. Case Requirements, and Best Practices), I suggest to add more information. I discussed this community work with our industry partners, and they are very interested in contributing their real cases to help us to test our proposed ontologies. However I don't know how to engage them.
- To transform the community group into a working group there are few things that I think should be clarified to the community, such as the implications, the degree of commitment required, how the possible outcome is managed, ...
- Maybe more/extra topic on BD MODELLING (not just integrating etc.)
- There should be a possibility to participate in an affiliate capacity without paying W3C membership.
- Include relations between semantic and geometric attributes (parametrics).

5. Do you have suggestions to improve the way in which the LBD CG currently works?

- - To really have an impact industry needs to be convinced, maybe through demonstrators implemented in public funded research projects
  - many people participate at meetings but never tell/ask anything; it remains unclear what their interest in the group is.

- maybe make use of the tools that W3C proposes (if possible) -> issue/action tracker, irc.w3c.org, webex ? --> would help be better prepared when the WG will start
- Future Meetings could be organized and announced at least one week in advance. A suggestion would be that this should be an action item for the meeting facilitator just after every meeting.
- Make sure that it will be a group effort
- For the web-based definition of construction products, we need more expertise in the direction of geometry definitions incl. parametrics, especially from other industry sectors. Investigation on descriptive vs procedural geometry definitions (semantic web vs. javascript-based)
- The organization structure of the working group is not clear. we can only see the chairs, however, for each topic or deliverable, there should be a leader or a coordinator. If possible, the fortnightly meeting can be organised based on the topics, and every two months we can have a general meeting to check the progress of each topic.
- The minutes of the meetings are a good way to to be aware of what has been said in them. However, in order to take advantage of the results of the discussions and to allow users to be more participatory, maybe we could use tools designed to facilitate this purpose. Tools such as Slack in combination with Google Drive can be a good alternative. From my experience in other groups, I can say that this is giving very positive results.

Previous minutes

https://docs.google.com/document/d/15Tqw02W1kAyc7kZb9jdhmcd46j6ZIjhv5wnvSa-qWSU/edit#

Next Calls

Thursday 5 October, 5-6PM CEST - Prof. Martin Hepp will present how GoodRelations ontology can be used for modelling product data. (missing invitation)

Monday 16 October, 5-6PM CEST - BREP Ontology (invitation sent already)

Monday 30 October, 5-6PM CEST

Monday 6 November - Friday 10 November: TPAC meeting