

## **W3C LBD Community Group Minutes - Call 16/11/2021**

### **Attendees:**

- Pierre Bourreau (Nobatek)
- Kevin Luwemba Mugumya (University of Nottingham Malaysia)
- Nathalie Charbel (Nobatek)
- Karl Hammar (Jönköping University)
- Zhen Chen (University of Strathclyde, UK)
- Katja Breitenfelder (Fraunhofer IBP)
- Anna Wagner (individual assoc. with PROSTEP AG)

### **Presentation slides**

- [https://github.com/w3c-lbd-cg/lbd/blob/gh-pages/presentations/energy\\_efficiency/20211116\\_BEM\\_ServerOntology.pdf](https://github.com/w3c-lbd-cg/lbd/blob/gh-pages/presentations/energy_efficiency/20211116_BEM_ServerOntology.pdf)

### **Date and time**

- 16/11/2021, Tuesday, 15:00-16:30@UTC/ 17:00-18:30@CEST/ 08:00-09:30@PST

### **Moderator**

1. Karl Hammar

### **Agenda**

1. Introduction of new/returning members
2. The issue of recording
3. Presentation by Nathalie Charbel: "BEMserver ontology, Ontology for a Building Energy Management Platform"
4. Q&A

### **Minutes**

1. Introduction of new/returning members
  - a. Nathalie Charbel, Nobatek research engineer. Focus on research projects on ontologies. PhD in 2018 on ontology to depict linked heterogeneous document corpuses. Colleague of Pierre Bourreau
2. The issue of recording
  - a. Nathalie agreed to record the meeting, No other participants objected
3. Presentation by Nathalie Charbel: "BEMserver ontology, Ontology for a Building Energy Management Platform"
  - a. Introduction of Nobatek/INEF4: research on green construction /energy efficiency

- i. known/relevant projects: hit2gap (background of BEMOntology, focus for today), BIM4Ren (B4R ontologies), Massdoc (LinkedMDR ontology, PhD origin), DataView (DVO ontology)
  - b. BEMServer
    - i. Open source building energy management platform based on Linked Data with modular software architecture
  - c. BEMOnt ontology
    - i. Core of BEMServer data model, consists of two models *Building infrastructure* (based on ifcOWL, connected to SSN, called OntoMG) and *Occupant behavior* model
    - ii. Refactoring of BEMOnt ontology to enhance modularity, queryability, extensibility, application of standardized vocabulary
  - d. Methodology
    - i. Collection of competency questions showed not all aspects were covered in original BEMOnt
    - ii. Questions were tagged with related topics as layer for the ontology
    - iii. Each layer has been analyzed regarding related ontologies and those most relevant and with the biggest overlap have been chosen to apply
  - e. Conducted adjustments
    - i. ifcOWL was excluded
    - ii. Extension of BOT as XBOT and SSN as XSSN to further specify e.g. room types
    - iii. Building elements used subpart of the building element ontology
    - iv. Energy module has its own, novel ontology, same goes for services ontology to describe available services of the platform
    - v. → Refactored BEMOnt is now modular, all modules are aligned, and relevant ontologies are reused and aligned where possible
  - f. Future work
    - i. Publication of ontologies
    - ii. Deploy it on BEMServer and support non-ontology-experts when using it
    - iii. Align to evolving ontologies and standards
- 4. Q&A
  - a. [Karl] BEMserver: you use a RESTful API. What about more message oriented source systems?
    - i. Most observed systems have RESTful APIs available
    - ii. For exceptions, other standards, most likely those for IoT/sensors/time series data, need to be supported in the future, too
  - b. [Karl] You model properties, you use blank nodes to add values and qudt units. Why did you not use custom datatypes?
    - i. BIM4Ren follows the same approach, which was proposed in the CEN committee, so we followed it for BEMOnt, as well
  - c. [Karl] Alignment between different existing ontologies: Is this (or another) community easy to align in form of ontology alignment?

- i. Still rather complex, but support exists. To reduce complexity in the future, we preferred to re-use existing ontologies and align them instead of creating novel ontologies
- d. [Karl] How do you deal with changes in the aligned ontologies?
  - i. One objective for future work is to obtain the alignment for future releases
  - ii. [Karl] do you already have best practices?
  - iii. Not yet
- e. [Kevin] History management & provenance: how do you manage topics like retention politics?
  - i. So far, it was not part of our scope, but it is an interesting topic that we should consider in the future
  - ii. [Kevin] Linked Data Event Streams could be a good point to start (<https://github.com/SEMICeu/LinkedDataEventStreams>)
- f. [Karl] BEMServer: Where are we regarding domain-agnostic representation of analytics, such as time series, data points, etc.?
  - i. The services ontology could be enhanced to address this topic, but it is not our current focus
  - ii. [Pierre] Plan is to install AI-based module on top of BEMserver to control individual buildings. BEMserver is aimed to be used as expert system that offers all relevant data to train models for individual buildings in that context. This requires that BEMserver will know which information is needed and find & fetch relevant information.
  - iii. [Kevin] leveraging some of the ML algorithm, it depends on the angle you choose to start: Reduce it to time series data or utilize the knowledge graph for your algorithm.
- g. [Karl] is it open source?
  - i. [Pierre] Yes, but we are currently refactoring and hoping to soon publish a revised version

## Next Call

- **14/12/2021**, Tuesday, 15:00-16:30@UTC/ 17:00-18:30@CEST/ 08:00-09:30@PST

### **Agenda: Jeroen Werbrouck -- Demoing the LBDserver/conSolid: combining SOLID and ICDD**

We are interested in getting suggestions from the community about potential agenda items and **Elevator Pitches** for the following calls. Please send your suggestions to the chairs or to [internal-lbd@w3.org](mailto:internal-lbd@w3.org), whether you have a short presentation to bootstrap the discussion, and an approximate duration you think the discussion will last.

## **Previous minutes**

<https://www.w3.org/community/lbd/meeting-minutes/>

<https://github.com/w3c-lbd-cg/lbd/tree/gh-pages/minutes>