W3C LBD Community Group
Minutes - Call 22/03/2022

Attendees:

- Mathias Bonduel (KU Leuven and Neanex)
- Katja Breitenfelder (Fraunhofer IBP/ acatech - German Academy of Science and Engineering)
- Argyris Emmanouil (Amberg Technologies)
- Edlira Vakaj (Birmingham City University)
- Philipp Hagedorn (RUB)
- Jeroen Werbrouck (UGent / RWTH Aachen)
- Diellza Elshani (ICD-University of Stuttgart)
- David Bucher (ETH Zurich - Chair of Innovative and Industrial Construction)
- Madhumitha Senthilvel (RWTH Aachen University - Design Computation Chair)
- Mads Holten Rasmussen (NIRAS, Denmark)
- Manos Argyris (Amberg Group AG)
- Conor Shaw (University College Dublin)

Date and time

- 22/03/2022, Tuesday, 16:00-17:30@UTC/ 17:00-18:30@CET/ 08:00-09:30@PST/ 00:00-01:30@CST

Moderator

- Mathias Bonduel

Agenda

1. Introduction of new participants
2. "Suisse L-CDE" (Philipp Dohmen and Manos Argyris from Amberg Technologies)
3. Discussion/Q&A

Minutes

1. **Introduction of new participants**
   a. David Buchner, PhD student, ETH Zurich, Chair of Innovative and Industrial Construction.

2. **"Suisse L-CDE"** - **The L-DCE Project for a data driven infrastructure** (Philipp Dohmen and Manos Argyris from Amberg Technologies)
   a. Background: Referring to existing principles

   i. 6 Main Principles Mc Kinsey: referring f.e. to "Future-proofing of projects and data-driven operating models"..,

  ii. The Gemini principles by CDBB: referring to five principles, e.g. Purpose: Must provide determinable insight into the built environment,

  iii. IPA Tip Roadmap 2030 -> encouriging "better decisions"

 b. Suisse: BIM Strategy for Public Authority (City of Zurich), goal: to facilitate stakeholders "making better decisions"

 c. Overall goal minimising data silos/ enriching data with meaning/ faciliating better decisions

 d. First result: AHB vision of a CDE for the City of Zurich

  i. Defining stakeholders, differents staches, Quality gate/ quality checks / project room = data space ; requirements on the other hand

 e. Problem statement: distributed data / in the cloud / accessibility to data/ metadata etc./trust in data storage/access/exchange etc.

 f. Suisse: The L-CDE Project

    1. Connect data bases with the help a p2p network

    2. Stream models - infrastructure domain, sensitive data

    3. Connect people (collaboration)

    4. Entity extraction via RDF

    5. IFC to RDF

    6. "Portfolio" view and projects view; multi-project environment:

    7. -> common data for portfolio (asset management)

    8. Minimal valuable product

    9. Development using project management method scrum

 g. Different data formats > One Graph Data base -> report and ICDD Container / 3D View visualisation

 h. Technical Approach & Challenges

    1. Information (source/data) extraction

     a. Extract data from various sources (and data formats), (un-)structured sources/ raw data, special focus on:

      i. PDF: training different Deep Learning models

      ii. Pointclouds, not sufficient labeled data referring to buildings -> developing a labeling tool for railway infrastructure domain and others

      iii. BIM models: complexity of IFC format/ schema, developing an IFC analysing tool, combination of IFC graph representation and IFC neural networks

      iv. Semi-Structured data (xls, Json, etc.) missing standardisation, project specific solutions (eventually intended to use NLP)

      v. Databases (more rarely)

    2. Connecting data

     a. From a single source

     i. Complexity depending from the type of source, e.g. BIM model versus excel, CSV, JSON etc. that can be transformed into graphs

     ii. Raw data require more complex methods e.g. link extraction

    b. From multiple sources that aggregate to one

     i. Mainly: "federated BIM models" authored by different disciplines

     ii. "Connecting" IFC models by GUIDs / focus on Graph matching

    c. From multiple, different sources

     i. Connecting entities that refer to the same thing but different sources

     ii. Matchi to an abstract representation (eg. connecting on an instance level in the graph model)

     iii. Data analysis is challenging, question on how to generalize the workflow in order to making it applicable to different types of projects

   3. Visualising models and data

    a. Using IFCjs, via Unreal Engine, Softwise Cadmium

    b. Creating a custom dashboard for data and graph visualisation

    c. Integration: POC of instant querying of the BIM models (served in Unreal Engine and stored in Neo4j as ab IFC-graph

    d. Open question: how to mitigate model changes to the viewer an vv

   4. Additional working packages

    a. Information container (ICDD) for archiving an delivering project data

    b. Federation: Checking out "Solid", and possibility to iterate Blockchain to vadicate data transactions

 ii. Proof of concept for some solutions/challenges in the city of Zurich project intended. But open tp discuss the many more challenges (as illustrated in the presentation)

 iii. City of Zurich - from the minimal available product to an overall sand box

   1. Existing data spaces / platforms : e.g. "Energieplattform", "Wärmeatlas", "TBA Baumaßnahmen", "Energiekarte" (energy map)

   2. > Cityenergyanalyst.com; metabuild.io

   3. Evaluating "with the same trustworthy data and simulations"

   4. How to frame the idea of Linked Data in this framework

5. Goal: Building up a huge sand box making use of data and facilitating decision making
6. Outlook: next steps
    a. Basic setup: Defining ICDD containers;
    b. Connectivity: connecting and exchange via p2p network
    c. Quality: how to assure quality especially the semantic enrichment of BIM Models,
    d. ICDD container
    e. Speed
    f. User experience (UX), making data accessible … for users
    g. Reorganisation
    h. Trust and security
7. Goal: Building up a lighthouse project

3. **Q&A - Open Discussion**
    a. Q (Mads): "Can you describe the fact that the two are intersecting and use a bot:Interface to quantify the overlap?" > |Life demo of [LD-BIM](#) by Mads and invitation to join the effort. Clash detection between IFC entities is already possible. A: interesting especially the question of querying run time in view of the a use case on city scale for the city of Zurich
    b. Q (David Buchner): How far did you consider "Blockchain" a possible technical solution for securing trustworthy data exchange? A: We will look deeper into possible solutions here.
    c. Recommendation (Madhumitha): "Something to consider for instance disambiguation would be seeing with models/elements occupy the same space, given the space geometry is included somewhere and use it in combination with string matches etc. for ontology matching when different vocabs are used."
    d. Q (Katja): Requirement of the City of Zurich / Use cases and depending on that unique value proposition for the minimal available product are not clear. Could you describe it from an overall point of view with and referring to special requirements on "identity and trust" by the city of Zurich? (as the choice for technical solutions might depend on that). It might be advisable to look into different efforts for sovereign and secure data spaces (standards and technical solutions). A: Concerning the requirement part we were contributing to the INFRA-X (as possible Gaia-X lighthouse) initiative.
    e. The discussion will be continued via e-mail, including questions referring to the geometry (BIM models).

Next Call

● 05/04/2022, Tuesday, 15:00-16:30@UTC/ 17:00-18:30@CEST/ 08:00-09:30@PDT/ 10:00-11:30@CDT

We are interested in getting suggestions from the community about potential agenda items for the following calls. Please send your suggestions to public-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://github.com/w3c-lbd-cg/lbd/tree/gh-pages/minutes