Session 3 - 4

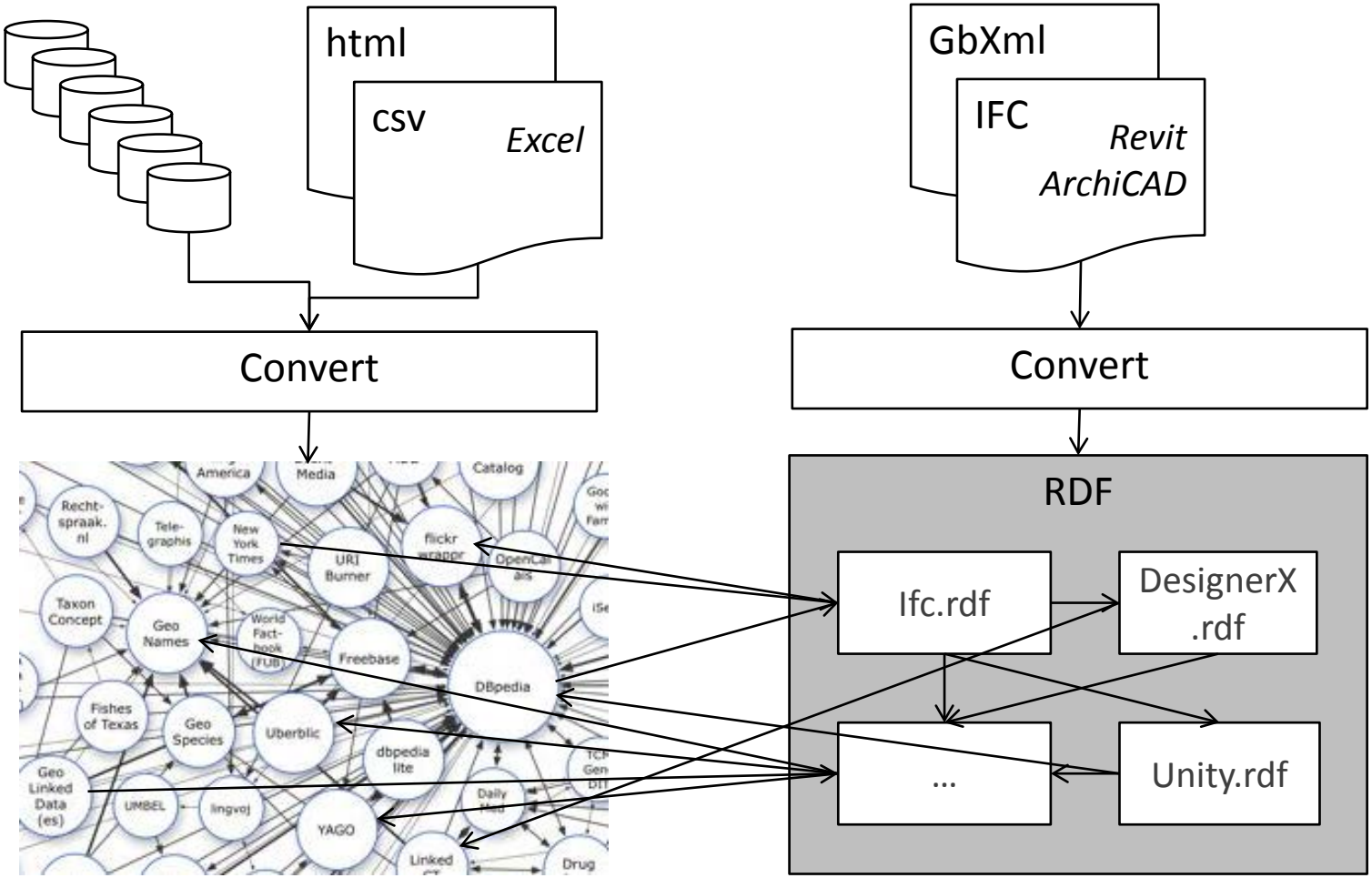
Key research topics

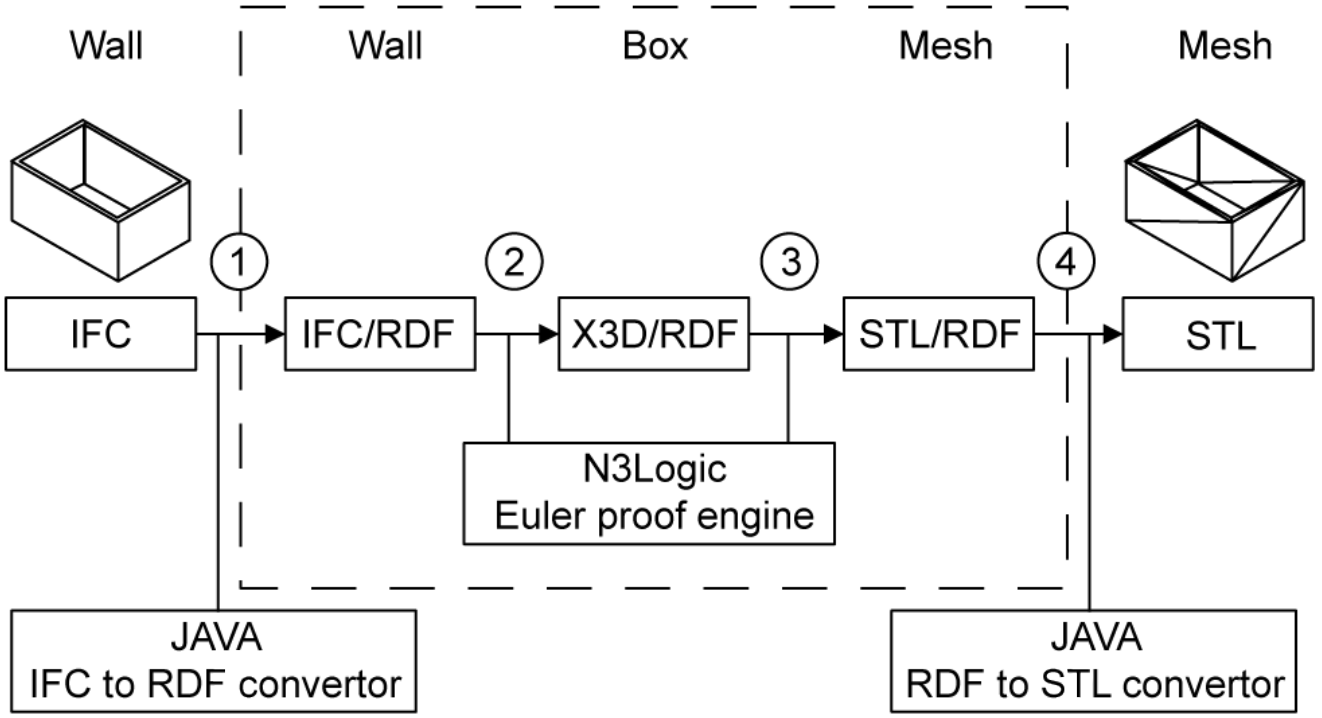
Position paper(s)

Collaborative EU project

Key topics

- Open product modelling
- RDF-izing and integrating available data
- Multi-domain data
- Manual approaches in finding agreements between models
- Automatic approaches in finding agreements between models


html
csv
Excel
GbXml
IFC
Revit
ArchiCAD
Convert
Convert
RDF
Ifc.rdf
DesignerX
.rdf
...
Unity.rdf
Recht-
spraak.
nl
Tele-
graphis
New
York
Times
URI
Burner
flickr
wrappr
Taxon
Concept
Geo
Names
World
Fact-
book
(FUB)
Freebase
DBpedia
Fishes
of Texas
Geo
Species
Uberblic
dbpedia
lite
Geo
Linked
Data
(es)
UMBEL
lingvoj
YAGO
Drug



[5] P. Pauwels, D. Van Deursen, J. De Roo, T. Van Ackere, R. De Meyer, R. Van de Walle, J. Van Campenhout. Three-dimensional information exchange over the semantic web for the domain of architecture, engineering, and construction. Artificial Intelligence for Engineering Design, Analysis and Manufacturing 25 (4) 2011, 317-332.

1. Issues related to Interoperability in the AEC sector

Different perspectives for BIM Interoperability

Scenario 1

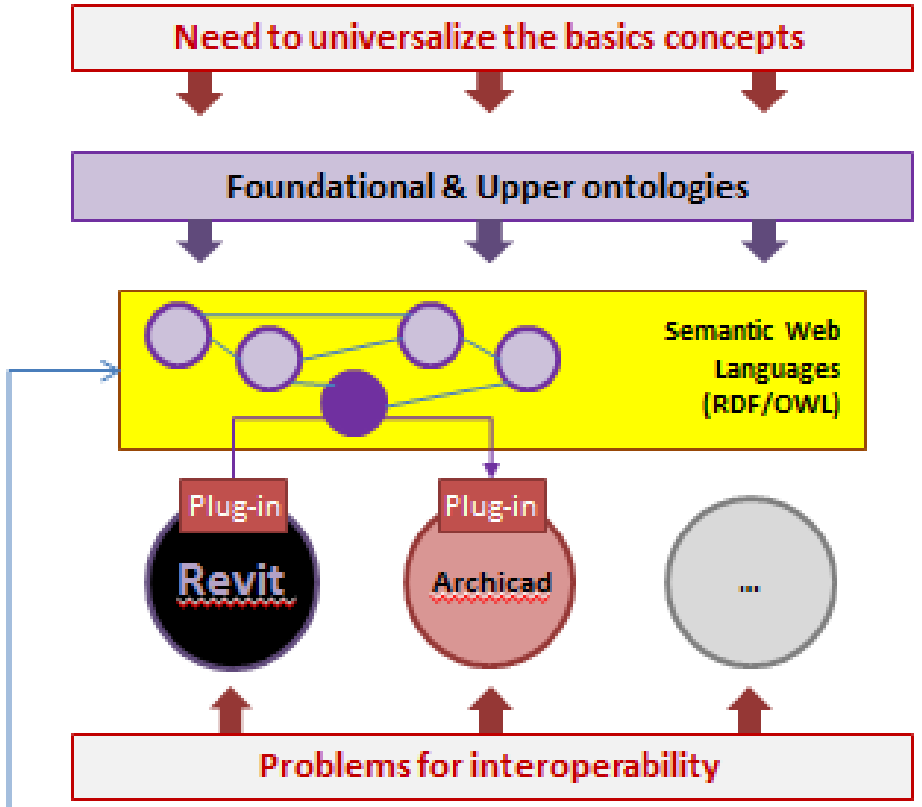
Example:

Huge Data model

(Standard = unique)

We have lose of data

Scenario 2

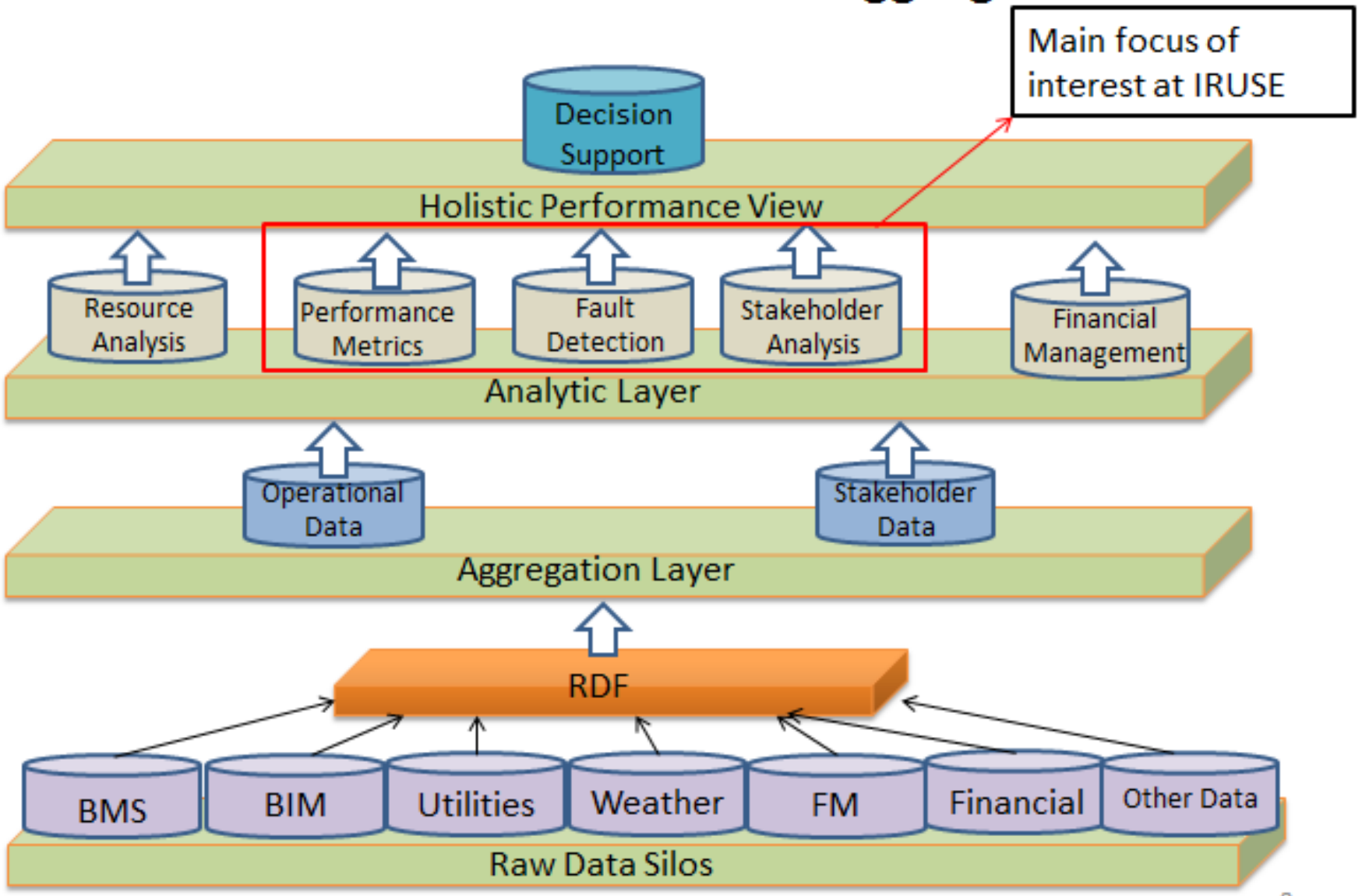


* IDEA

Extract building component models as an ontology defined in RDF/OWL languages (for each one)

The plug-ins programming provides an alternative via.

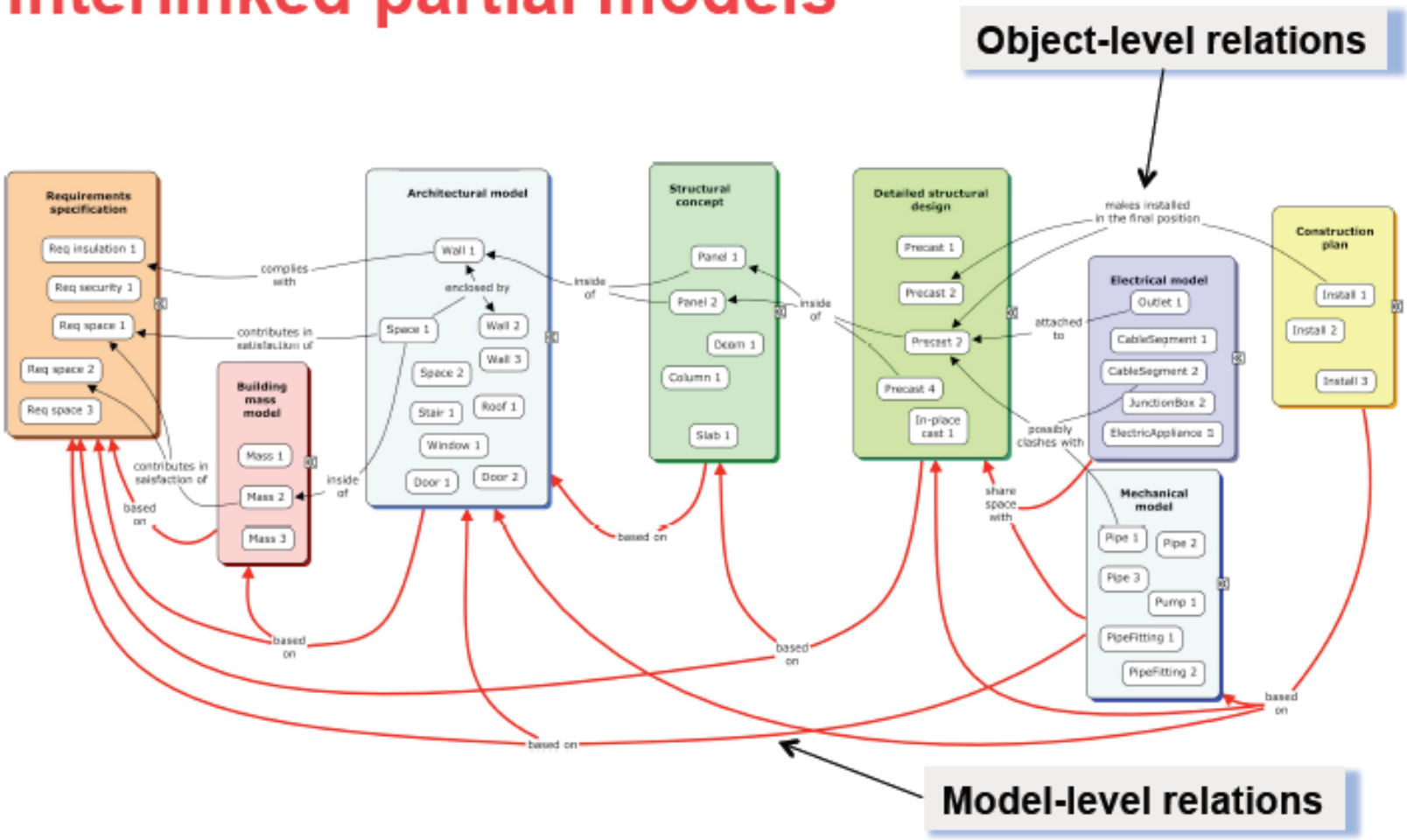
We intend to Leverage a Standard Conceptual Overview of Information Silos and Data Aggregation



Case Study: DERI Building

- DERI Building
  - No BMS or BEMS
  - 160 person Office space
  - Café
  - Data centre
  - 3 Kitchens
  - 80 person Conference room
  - 4 Meeting rooms
  - Computing museum
  - Sensor Lab

Interlinked partial models



Summary

- IFC-to-RDF: short term project possible?
- Integration of information by linking data
  - Within construction project
  - Outside construction project
- How to create the links?
  - Domain-specific knowledge and expertise required
- How to manage the links? Change management?
  - Provenance management

Identify applications

- Use case DERI – IRUSE – LBNL
  - First focus: Linking information
  - Second focus: Improving design workflow (performance, …)

POSITION PAPER(S)

Position paper(s) – regular tracks

- Automation in Construction
- Advanced Engineering Informatics
- AIEDAM
- Journal of Information Technology in Construction (ITCON)

Workshop Open Systems & Methods for Collaborative BEM

- First edition on CAADFutures 2011 (Liege, BE)
- Second edition of ECAADE 2012 (Prague, CZ)

- CONTEXT

The (improved) integration of various design and analysis tools and techniques has long been a goal of ICT research and development (in AECO as well as other related domains), but the goal remains elusive. Decades of engineering-inspired and automation-oriented effort has tended to oversimplify the nature and challenges of design activity. This approach has also tended to advocate and rely upon standardisation of ontologies and workflows in an effort to limit and thus control the types and relationships (and quantities ?) of data to be handled and processed.

- *AIMS*

The proposed half-day workshop aims to gather researchers, practitioners and developers in exploring and advancing an alternative approach which allows the highest practicable degree of workflow customisation and user-ontologies, in order to avoid the excessively limiting aspects of previous approaches to design-analysis integration.

We intend to discuss diverse alternative approaches to the outlined situation in order to better understand the expanse of the problem and to identify priorities in addressing the problem scope."

SWJ - Surveys on Application Areas of Semantic Technologies

- Special Issue Surveys on Application Areas of Semantic Technologies
- Link: http://www.semantic-web-journal.net/blog/semantic-web-journal-special-call-surveys-application-areas-semantic-technologies
- *The Semantic Web journal calls for survey papers on the state of the art in research, development, and deployment of Semantic Web technologies in specific application areas and domains. Surveys should focus on one specific application area and discuss in a comprehensive way*
  - *its importance,*
  - *the particular (past, present, and future) challenges faced in applying Semantic technologies in this area, and*
  - *the state of the art in developing foundational principles and practical solutions related to this area.*
- Deadlines:
  - Paper submission: May 15th, 2012
  - First notification: Usually within 8 weeks of submission

COLLABORATIVE EUROPEAN PROJECT?

Common themes

- integration of information by linking data
  - Within construction project
  - Outside construction project
- life cycle analysis and support:
  - design
  - performance calculation
  - construction
  - maintenance

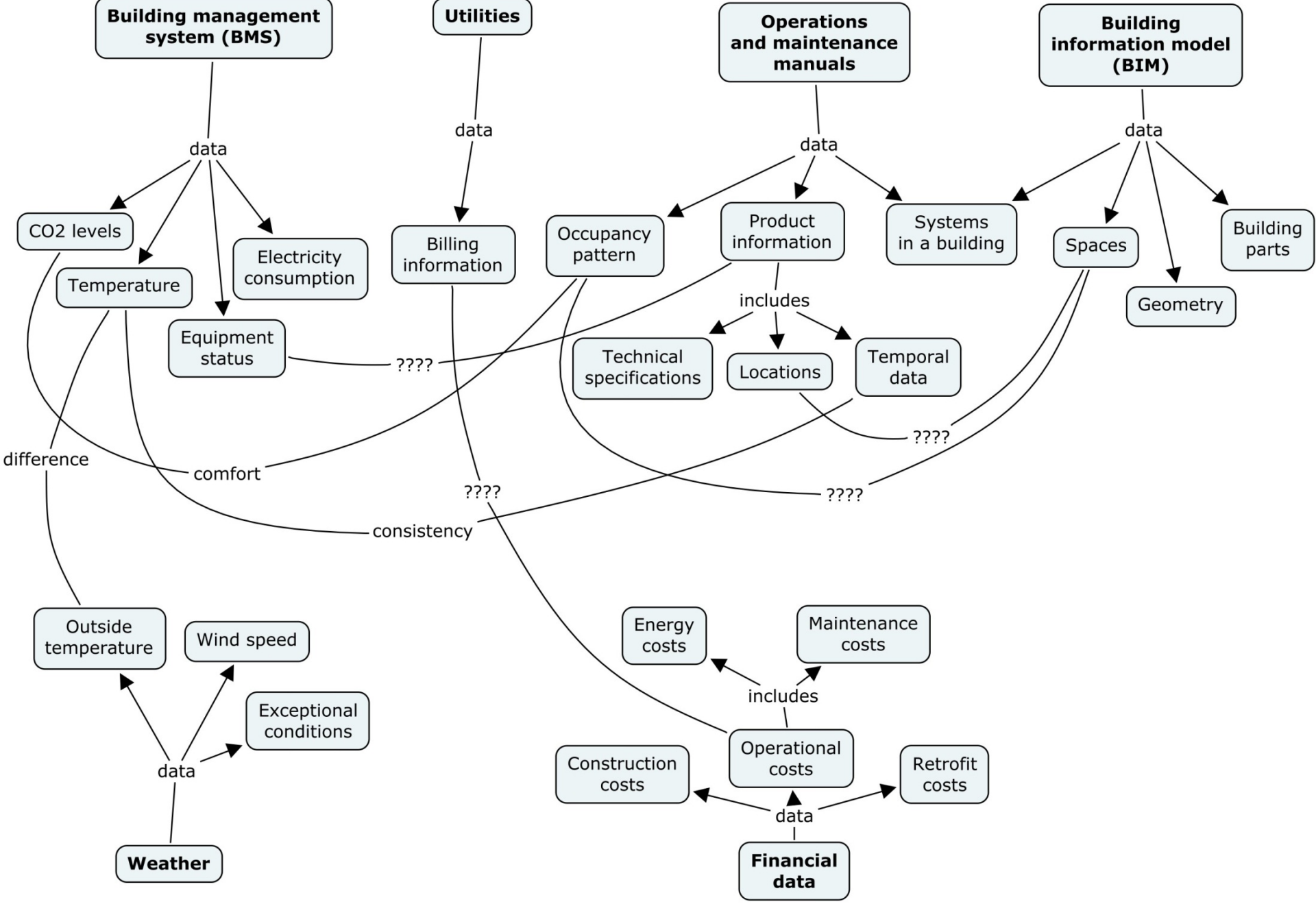
    => address information loss with semantic web technologies

Research questions

- How to create the links?
  - Domain-specific knowledge and expertise required
- How to manage the links? Change management?
  - Provenance management

Identify applications

- Use case DERI – IRUSE – LBNL
  - First focus: Linking information
  - Second focus: Improving design workflow (performance, …)


Building management system (BMS)
Utilities
Operations and maintenance manuals
Building information model (BIM)
data
data
data
data
CO2 levels
Temperature
Electricity consumption
Equipment status
Billing information
Occupancy pattern
Product information
Systems in a building
Spaces
Building parts
Geometry
includes
Technical specifications
Locations
Temporal data
????
????
????
????
difference
comfort
consistency
Outside temperature
Wind speed
Exceptional conditions
data
Weather
Energy costs
Maintenance costs
includes
Operational costs
Construction costs
Retrofit costs
data
Financial data