CCE – Construction Cost Estimating

TPAC 2016

Francisco Regateiro

Linked Building Data Community Group

19 September 2016

Context

- Built Environment Sector (AEC-FM)

  "The built environment consists of buildings, and of a network of interlocking infrastructures for energy supply (and sometimes generation), water and sewerage, telecommunications, transport, and waste management."

  – Complex professional environment

  – Specific products (lifecycles) and processes

  – Potential for cost and environment saving

Semantic Web

- Ontology-based knowledge representation facilitates

    – Decision support

    – Data interoperability

    – Information retrieval

    – Natural language processing

Open Standards

- WSDL
- RDF
- SPARQL
- OWL
- SWRL
- SQWRL

AEC-FM Knowledge Sharing

- Theoretically in the good track

  – e-COGNOS project (high level generic ontology for interoperation between the knowledge bases of construction enterprises)

  – "Urban Ontologies for an improved communication in urban civil engineering projects"

  – "A new teaching tool in education for sustainable development"

  – …

- But, real knowledge is not yet "integratable"

  – Classification schemes (IFC, CityGML, Uniclass, LEED, …)

  – Online databases (reegle, greenbooklive, …)

CCE (1/5)

Description

In the EU, public works contracts and design contests may require the use of specific electronic tools, such as of building information electronic modelling tools or similar. National laws may legislate towards the mandatory use of BIM (Building Information Modeling) for certain contracts, for example those above a certain level of complexity or value (of the works contract in question or foreseen in the design contest). The Portuguese law, for instance, considers the use of electronic tools for the purpose of communications during the contract award procedure but does not imply any use of BIM tools.

CCE (2/5)

Objectives

1. Information exchange between the contracting authority and the candidates or tenderes during the award procedure

    Dialogues in order to complete the contracts conditions, and concerning the procedures rules.

    The procurement documents, including the technical specifications (which themselves include, in works contracts, the design documents), may be clarified and modified at the request of an economic operator or at the contracting authority's initiative. At a later stage of the procedure, mistaken or omitted works of the technical specifications (called error and omissions at this stage) should be identified by the economic operators and accepted or rejected by the contracting authority.

CCE (3/5)

Objectives (cont.)

2. Information exchange during contract performance

Dialog between the contracting authority and the contractor regarding the following themes, among others:

- Work plan;

- Contract modifications (namely works to be added, referred in the law as errors,

- Omissions or, when unforeseeable and distinct from the formers, additional works);

- Works measurements for payment purposes;

- Management of the works and of the resources.

3. Additional dialog between parties in works contracts usually defined in the contracts themselves

CCE (4/5)

Stakeholders

Contracting authority, tenderers, contractor

Data Requirements

Building Product, Building Data, Norms and Regulation, Best Practices Methods and Technologies, Actors, Building owner requirements

CCE (5/5)

LD benefits

– structured vocabularies allow data integration

– logical basis allows inference

External sources

– Regateiro, F. & Spínola R. 2014. Challenges of Building Information Modeling (BIM) in Portuguese public works contracts. 2nd European Conference on ePublic Procurement, Lisbon, Portugal, May 2014.

– Niknam, M. & Karshenas, S. 2015. Integrating distributed sources of information for construction cost estimating using Semantic Web and Semantic Web Service technologies. Automation in Construction 57: 222-238.

The End

Francisco Regateiro

Department of Civil Engineering, Architecture and Georesources

Instituto Superior Técnico, Universidade de Lisboa, Portugal

francisco.regateiro@tecnico.ulisboa.pt