A database for the French Precast Concrete Industry’s BIM objects library
Context

The French federation of industrial manufacturers of concrete products

Business & Innovation needs

Research & Development activities

The French concrete industry's research center
Digital model, object and data base

Geometric container with spatial location and unique identifier (ID)

Towards a database thanks to the unique identifier (ID)
Digital model, object and data base

Geometric container with spatial location and unique identifier (ID)

Calculation
Analysis
Technical choices
Scheduling
...

Towards a database thanks to the unique identifier (ID)
Digital model, object and data base

- Performance
- Composition
- Manufacturing
- Transport
- Price & Availability
- Installation
- Sustainability & Re-use
Data dictionaries to ensure knowledge transfer

- Capture business semantics
- Data Dictionaries
- Integrate business semantics

Knowledge → Structuring semantics in a data dictionary → Diffusion in BIM models
Data dictionaries to ensure knowledge transfer

Content proposal → Data Dictionary → Validated content

Organizational environment → Tool environment → Users environment
Dictionary, catalog, data base – Precast Concrete Industry approach

Specific construction sector

Object to be described

Characteristics of the object to be described

Operator of the sector dictionary

Construction object

Group of properties

Property

Sector data user

Digital object

Governance trade/sector/industry

Governance of the tool

Specific use governance
Dictionary, catalog, data base – Precast Concrete Industry approach

Specific construction sector

Governance trade/sector/industry

Object to be described

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Construction object

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EN ISO 12006-3
EN ISO 23386
EN ISO 23387

Digital object

Sector data user

Governance of the tool

Specific use governance
Dictionary, catalog, data base – Precast Concrete Industry approach

- Governance trade/sector/industry
- Governance of the tool
- Specific use governance

Specific construction sector
- Operator of the sector dictionary
- Sector data user

Object to be described
- Construction object
- Group of properties
- Digital object

Characteristics of the object to be described
- Property
- Use of objects

Product experts
- Creation of model
- Creation of properties
- Validation

Product WGs
- Création of objects
- Use of objects

Governance of the tool

Object to be described

Construction object

Group of properties

Property

Digital object
Data dictionary environment

Source
Particular standard (profession and/or product)

Contributor
List of properties

Property
Group of properties

Property and/or group of properties attributes

Integration into the dictionary

Data template

Data dictionary (tool based on standards EN ISO 12006-3, 23386, 23387)

Experts

Tool’s Operator

Tool’s Provider/Maintainer

Governance between contributor & operator

Link customer/provider

BIM & digital construction environment

Object

User

Softvendor’s libraries
Design models
Construction models
Manufacturer’s catalog

Design models
Construction models

Manufacturer’s catalog

11
Our data dictionary environment

- Precast Concrete Manufacturers
- Models & Properties
- Precast Concrete Industry Data Dictionary
- Generic Objects Catalog
  Data model ($\sum n \text{ properties}$) + Generic values = Generic objects
- Define
- cobuilder
- open datBIM
Data template for an half turning concrete stair

Construction object’s definition:

A succession of horizontal stages at a pitch which makes it possible to pass on foot to to other levels, in which the direction changes for 180°

Properties for describing the data model:

- application
- maximum durability to fire resistance
- is external
- live load (surface density)
- live load (surface density)
- environmental product declaration
- nosing overhang
- is certified
Our data dictionary environment

Digital object for an half turning concrete stair

Properties from the data dictionary

Values for a generic object
Our data dictionary environment

Precast Concrete Manufacturers — Precast Concrete Industry Data Dictionary — Generic Objects Catalog
  - Data model ($\sum n$ properties) + Generic values = Generic objects
  - Specific Objects Catalog
    - Data model ($\sum n$ properties)
    - Specific Object Catalog
      - Regulation Data Bases
        - Regulation D.M. ($\sum n$ properties)
        - Manufacturer values
        = Regulation objects (DPP for ex.)
      - User’s libraries
        - Data model ($\sum n$ properties)
        + Values from construction projects
        = Project objects

Models & Properties — Prescription

Business — Optimisation
Nexte step: the need to harmonize data

Data dictionaries network

- Sector data dictionary
- Sector data dictionary
- Sector data dictionary

Project data environment

- Dashed data stream
Vision of the future

Data dictionary → Data dictionaries’ network → End-users → BIM processes → Connections by API

Design → Manufacturing → Markets → Construction → Operation
Rémi LANNOY

r.lannoy@cerib.com

+33 633 931 669