BIM & IFC-to-X3D

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BIM

- BIM (Building Information Modeling)
  - A digital representation of physical and functional characteristics of a facility.
  - A shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.

http://www.directindustry.com/
Coordination between the different disciplinary models. (© M.A. Mortenson Company)

4D scheduling using the BIM model (top image) and the details of site utilization and civil work (lower image) used for coordination and communication with local review agencies and utility companies. (© M.A. Mortenson Company)
OpenBIM

- A universal approach to the collaborative design, realization and operation of buildings based on open standards and workflows.

- An initiative of buildingSMART and several leading software vendors using the open buildingSMART Data Model.

http://buildingsmart.com/openbim
OpenBIM & IFC

- IFC (ISO/PAS 16739)
  - The Industry Foundation Classes (IFC) : an open, neutral and standardized specification for Building Information Models, BIM.
  - The main buildingSMART data model standard
BIM CAD Systems

- Autodesk Revit Architecture
- Bently Architecture
- Nemetschek Allplan
- GRAPHISOFT ArchiCad
- Gehry Technologies (GT) Digital Project
  - CATIA V5 as a core modeling engine
- Vectorworks Architect
Simple IFC-to-X3D Conversion

- Loading IFC → Saving as “VRML” → Converting to X3D
  - Most BIM CAD Systems provide IFC export/import functions
Simple IFC-to-X3D Conversion (ArchiCad)
Conversion of ITalab* Test Models

* ITalab, Kyunghee Univ., http://italab.kyunghee.ac.kr/
Next step

- IFC-to-X3D Conversion

- Parsing IFC → IFC-to-X3D Mapping → Writing as X3D
  
  - Parsing IFC : EXPRESS (ISO 10303-11)
    - JSDAI (http://www.jsdai.net/) : an API for reading, writing and runtime manipulation of object oriented data defined by an EXPRESS based data model.
      * STEP (ISO 10303), PLIB (ISO 13584), ...  

  - IFC-to-X3D Mapping : Vocabularies / Structures / ...
Thank you!

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