ICNB

Increasing competence in Northern Building

Student Projects

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BIM to RenoBIM
BIM to RenoBIM: Case Åström, Hartela

The area surrounding Åström's building is under reconstruction. Part of the old buildings are preserved for their historical importance.

A half of Åström's building will be demolished. It has to be rebuilt as equivalent by a command of National board of antiquities.
BIM to RenoBIM: Case Åström, Hartela

Autodesk ReCap:
Simplifying and removing unnecessary points from the point cloud

Export to Autodesk Revit as reference

Creating a 3D model with Revit

BIM model for the constructor to use. Model is also used as a recording for the archives of National board of antiquities
BIM to RenoBIM: Case Åström, Hartela
BIM to RenoBIM: Case Åström, Hartela

Studied the possibility of using a hand held 3D scanner to capture fine details of Åström's building.

Challenges for outdoor usage; Temperature & Moisture, Dust

Following model was created in 30 minutes.

©GoogleMaps
BIM to Construction Site
New building which was designed as 2D drawings with AutoCad

3D building models were created based on those drawings. BIM model was used as reference for structure designer's plans.

Solibri Model Checker: Combination model was used as a collision checker between different plans (structures, architecture, and HVAC). Potential errors were found and fixed well on time.
**Bim to Construction site: Case Hartela**

- Updated guidelines for ordering Building information model
- Excel-based
- Different sheets for architectural and structural models
- Layer by layer description (talo 2000), necessary parameters, naming guidelines and cell for extra information
BIM to Window & Door Manufacturing
BIM to Window & Door Manufacturing
Case: Kaskipuu, window and door manufacturer

SITUATION NOW:
Pdf-forms, printed information => Not structured, not automatically readable
Parameters for window and door production must be set manually several times
⇒ causes a lot of (manual) work
⇒ system is prone to human errors

GOAL:
Study window and door basic parameters of IFC
⇒ Factory ERP (Enterprise Resource Planning) can import directly parameters
  ⇒ Production can use ifc-parameters automatically
BIM to Window & Door Manufacturing
Case: Kaskipuu, window and door manufacturer

⇒ Architect; BIM Model with Window and Door Objects:
  Size, Location (Storey, Apartment, Room), Color, Material, Glazing, Fire Resistance, U-value etc...

⇒ Door & Window Retailer: Input data (handmade)

⇒ Factory ERP: Input data for manufacturing (handmade / semi-automatically)
**BIM to Window & Door Manufacturing**

**Case: Kaskipuu, window and door manufacturer**

**IFC:**
Makes it possible, but some extra work to Architect and Window/Door manufacturer (better object libraries)

**CSV-lists: (CAD-model to Excel)**
- Makes it possible to generate lines of code that the door manufacturing software/machinery can read
- Window & Door Schedules directly from ArchiCAD/Revit
- Some information can be read directly from the objects
- Some information still have to be handwritten
BIM to Visualization
BIM to Visualization: Case PAVE Arkkitehdit

A lot of Studies and Comparison with different software files formats...

⇒ Model structure according COBIM 2012

Thesis: Aapo Räinä, External Visualization Software Within BIM Process
BIM to Visualization: Case PAVE Arkkitehdit

A lot of Studies and Comparison with different software and rendering engine...

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Augmented Reality

Small scale:
- Easy to use, anywhere
- Small targets (paper/simple object)

Full scale:
- Makes it possible to see upcoming building in full scale
- Correct position → relations to existing buildings and environment
- Can use existing building as a target OR a smaller object

Thesis: Aapo Räinä, External Visualization Software Within BIM Process
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BIM to 3D Printing
BIM to 3D-printing: Case Project Äljäke

Collaboration with IT-, mechanical- and construction department (OUAS)
Associated with a American University of Sharjah

Goal:
3D print a simple residential building (1:20 scale)
⇒ Create a concept for BIM to 3D-printing

Study how to export geometry and data in IFC-format for the printer & robot

Design: https://www.youtube.com/watch?v=0RP1cQxxk0k

Prototype: https://youtu.be/Eb8djIz4Szc

First real life extruding: https://www.youtube.com/watch?v=A3bYao-sFo8
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Thank you

Aapo Räinä
Janne Kanniainen