Laserscanning within the building lifecycle

FIG workshop "BIM for Surveyors"
What is the building lifecycle?

http://www.climatetechnologywiki.org/technology/building-life-cycle-and-integrated-design-process
When do I need reality capture?

Planning
Surveying

Operation
Surveying for FM

Construction
ongoing Surveying

Demolition
Capture

Planning
Surveying

Process

“consolidate the captured data to make them useable”

- Registration
- Data Fusion
- Data Management
- Data Distribution
- Data Conversion

Integrate + Value

Deliver

Workflow if no full BIM package is needed to create the final result
Scan-To-BIM
Turning point clouds into an as-built BIM model

But:
As-built capturing is quick and easy, detailed modelling can be very time consuming
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Facts:
- Scans: 470
- On-site measurement: 5 days
- Modelling: 5 weeks for 2 persons
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How can we reduce the time consuming and expensive modelling?

Automation

- Use the point cloud as model reference
- Fitting of basic geometry
- Fitting of complex model objects
- Object recognition and parameter adjustment
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- Insert point cloud
- Define levels for building storeys
- Model overall geometry
- Place building components
- Create „as-built“ components

Wall and pipe fitting
Wall and pipe alignment
Work plane fitting
Construction guides
Planning
Surveying

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When do I need reality capture?

- **Planning**
  - Surveying

- **Operation**
  - Surveying for FM

- **Construction**
  - ongoing Surveying

- **Demolition**

- **Conversion**
Construction
ongoing Surveying

Applications:

- Model quality check
- Live analysis for construction processes
- Construction process verification
Floor flatness analysis using tolerances of the USIBD Standard
Application:
Check for differences between the model and the as-built situation
Construction ongoing Surveying

**Application:**
Live analysis for construction processes

**Wet concrete scanning:**
Live feedback on-site as long the concrete is changeable
Application: Construction process verification

How does structure compare to the design model?

Where is it off or missing?
What can we expect in the future?
What can we expect in the future?

- Sensor integration and faster data acquisition (walk and fly)

- Automated modelling embedded in user workflows with quality control toolsets

- Almost instant on-site feedback if construction meets design specifications
Questions?