

GeoBIM benchmark Workshop



2nd December 2019

Overview

Introduction on GeoBIM

3D city models

Building
Information
Models

Workshop
&

Discussion: ideas
towards integration



GeoBIM benchmark workshop
Programme

Kattenburgerstraat 5, Building 027W, 1018 JA Amsterdam
Room: 'Beijing/Shanghai'

AMS AMSTERDAM INSTITUTE FOR ADVANCED METROPOLITAN SOLUTIONS

EuroSDR

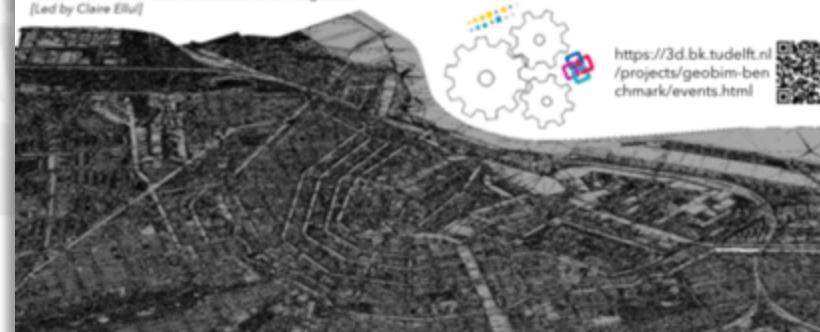
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 - h. 10.00-11.00 3D City models overview: [Balázs Dukai & Tom Commandeur]
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 - h. 15.15-15.45 Workshop - Replicating the results for Task 1
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 <https://3d.bk.tudelft.nl/projects/geobim-benchmark/events.html> 



TUDelft 3DgeoInfo **AUCL** **LUND UNIVERSITY** **NUS** National University of Singapore **National Technical University of Athens**

GeoBIM use cases

Georeferencing BIM

GeoBIM Conversion
procedures

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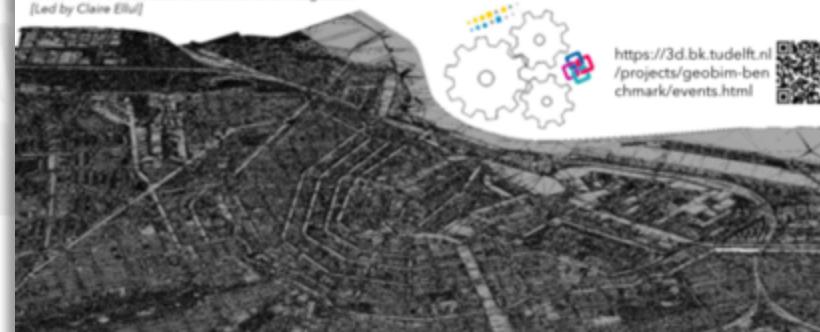
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GeoBIM use cases

3.743 [m³]

Georeferencing BIM

GeoBIM Conversion
procedures

5.176

Exchange experiences & discuss:

Issues with open standards

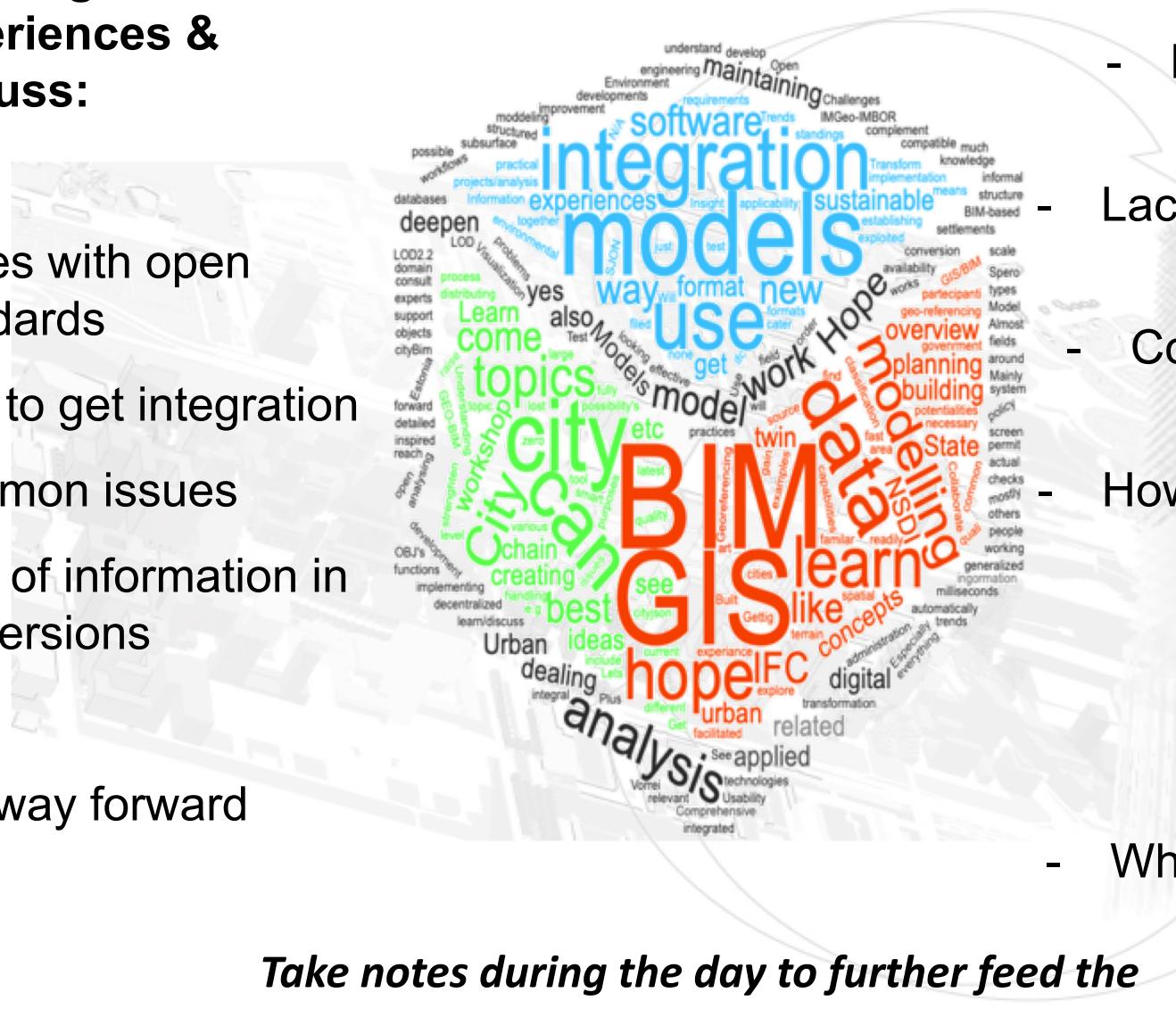
How to get integration

Common issues

Loss of information in conversions

The way forward

LOD



Take notes during the day to further feed the discussion in the end!

Other Challenges:

- Lack of understanding of GeoBIM and how and why it can be useful
 - Lack of GIS/BIM skills and especially combined skills across both
 - Cost of implementation (changes to workflows, new staff skills)...
 - How to make Geo- & BIM worlds talk to each other?
 - What standards?
 - What are the most important stakeholders to be involved?
 - What are the three factors that could significantly push forward the GeoBIM integration?

What is GeoBIM?



Integration of two very powerful 3D information systems,

(mainly) 3D city models & BIM

in order to suitably support built environment applications
(representation, understanding, analysis, simulation, planning).

3D city models use cases

GeoBIM



3D geoinformation:
3D city models



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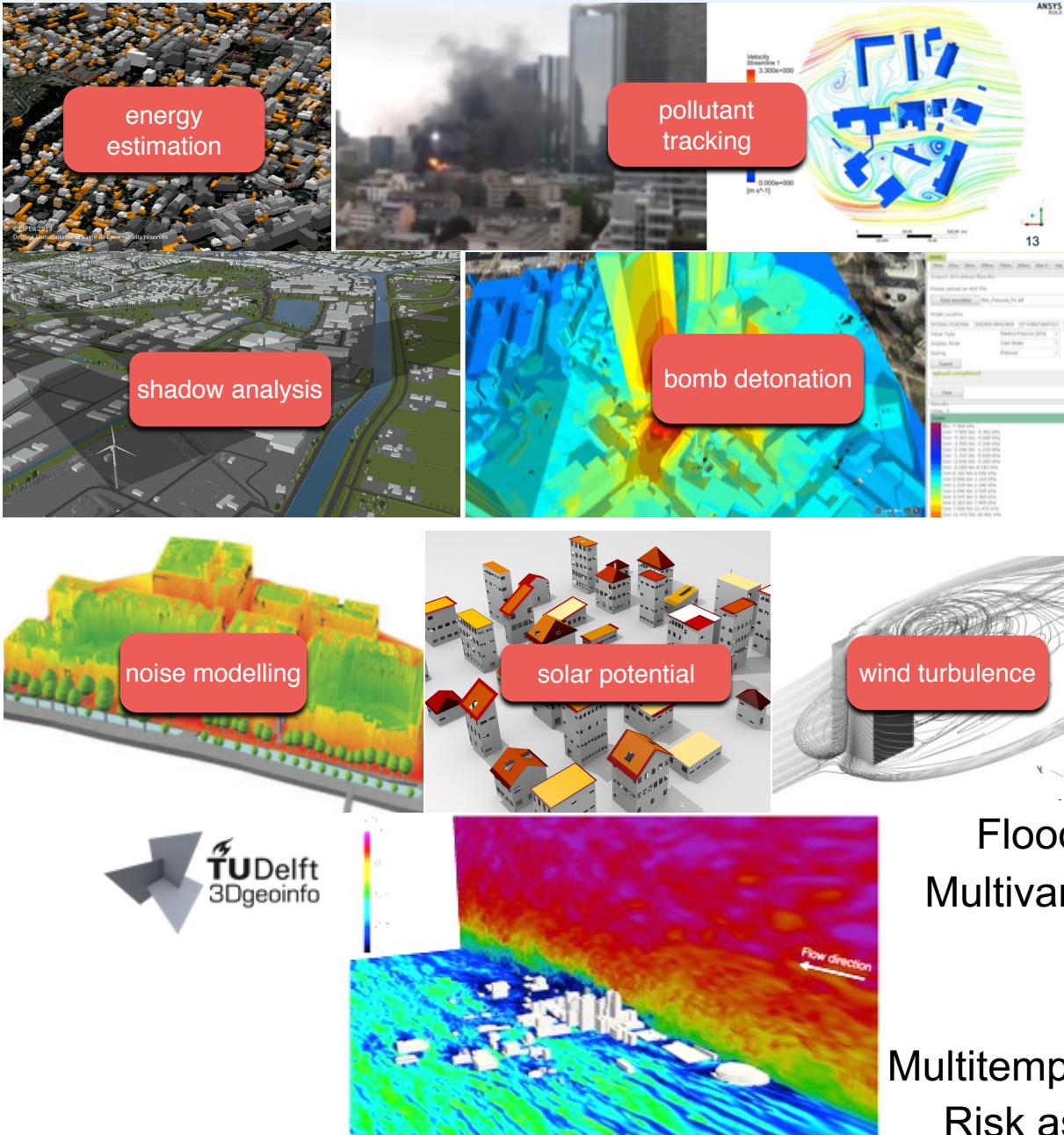
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TU Delft 3Dgeoinfo

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Navigation
Flood simulations
Multivariate analysis
3D cadastre
3D archive
Multitemporal analysis
Risk assessment...

Building Information Models use cases

GeoBIM



Building
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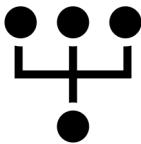
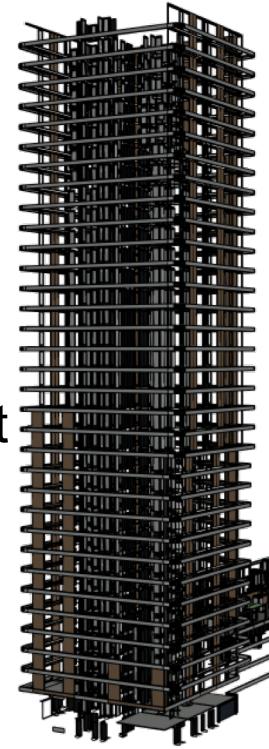
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- design options assessment;
- **quantities and cost estimation;**
- construction simulation;
- energy modelling;
- **project management support** (efficient collaboration, multi-disciplinary project team);
- **facilities and asset management;**
- **better design and construction coordination;**
- **reduced construction costs** (less delays on-site, rework...)
- **reduced operational costs** (seamless information delivery for facilities management at handover).



3D city models miss something

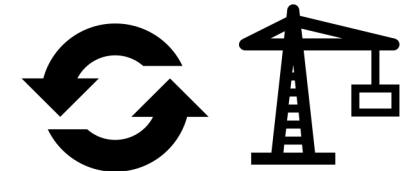
GeoBIM



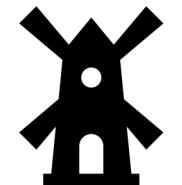
3D geoinformation:
3D city models



Difficult to update (new building, building changes...)



Missing **detailed building information (materials, energy related information...)**



Difficulties in modelling large numbers of **high level of detail** buildings

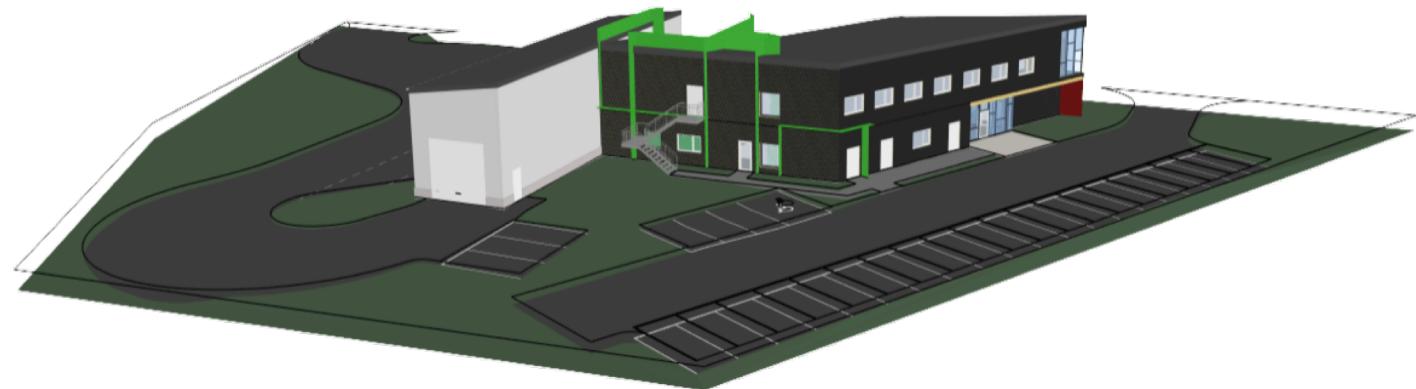


Building Information Models miss something

GeoBIM



Building
Information
Models



No context (transport networks, environmental features, urban values, infrastructure connections...)



Somewhere in the world (only generic location information, with very low accuracy...)



Discrepancy between the **precision** of what is modelled in the BIM and the context where it is supposed to be built (possible need to fix them on site, during construction)

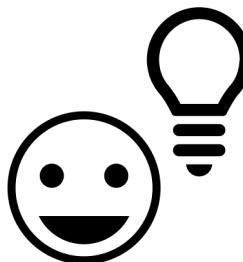


Great advantages from integration

GeoBIM = integration of geoinformation with BIMs

↓

3D geoinformation:
3D city models
+
Building Information Models



GEO world point of view

- High **level of detail** 3D cadaster
- No tasks duplication** (3D data collection)
- Efficient databases **updates** without additional costs
- Effective **data exchange** with **professionals** (architects, engineers, environmental scientists, etc.)
- Stronger information for **lifecycle asset management & city analysis**



Context for design reference

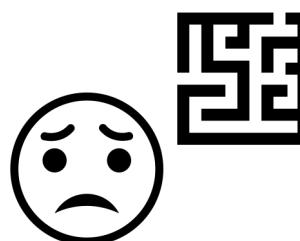
Improved **test of building properties**: designed building into its context

Test of the **impact of the building** on the city or landscape.

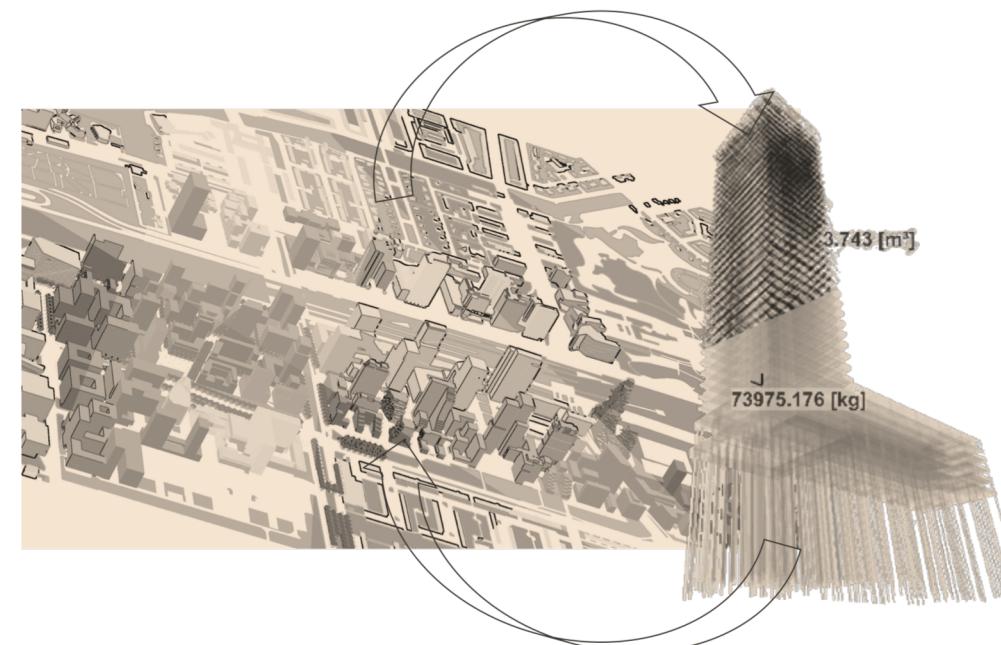
Multiscale vision (from construction elements to whole territories)

GeoBIM = integration of geoinformation with BIMs

3D
geoinformation:
**3D city
models**
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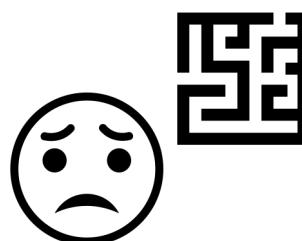


1. Integration of **data** (common characteristics, they fit together)
 2. Data **interoperability**
 3. Reliable **conversion procedures**
 4. Integration of **procedures** (BIM and GIS tools)

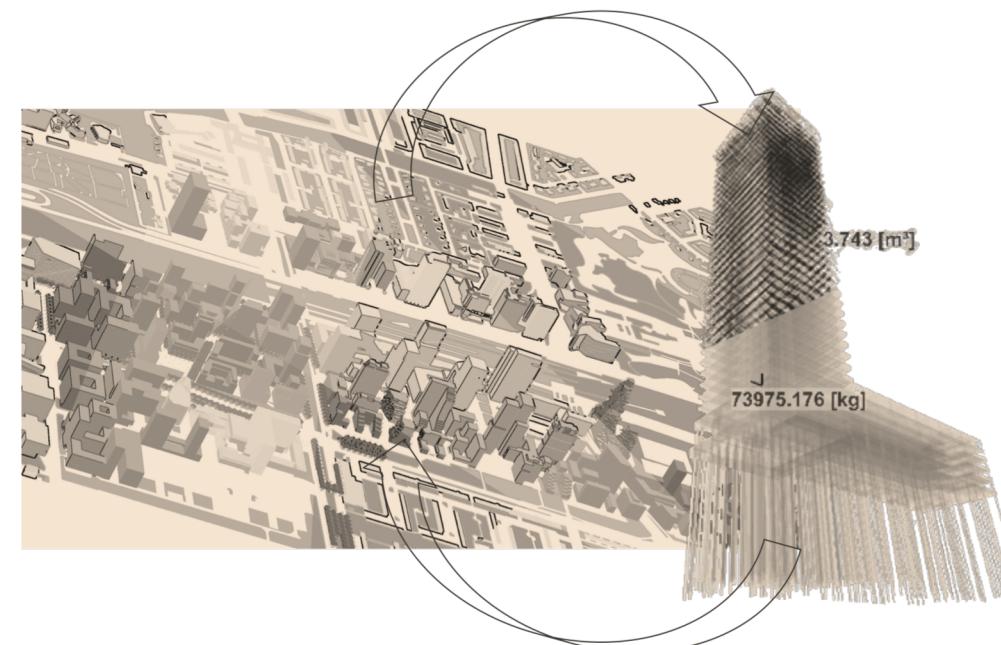
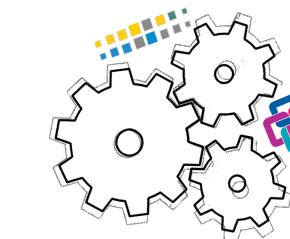


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geoinformation:
**3D city
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Open standards, therefore, exist

 buildingSMART International

 CityGML

However... Are they suitably supported in tools?
Are current users able to exploit their power?
Are the standardized data actually interoperable?

 How can I effectively use standardized data?

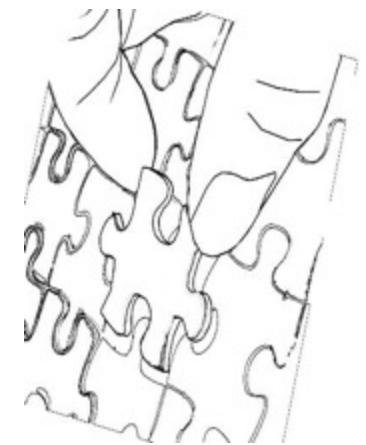
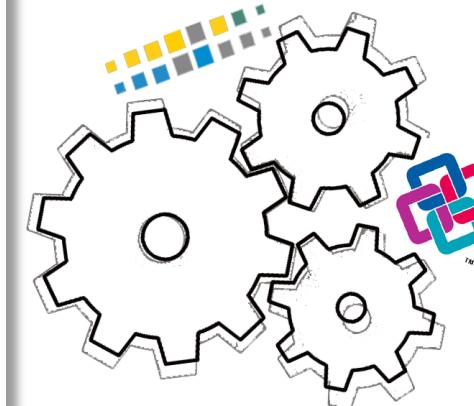
Image by [Lukas Bieri](#) from [Pixabay](#)



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Aim:

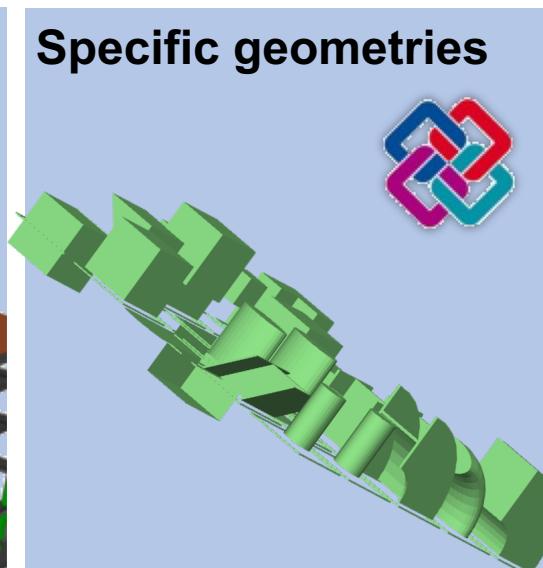
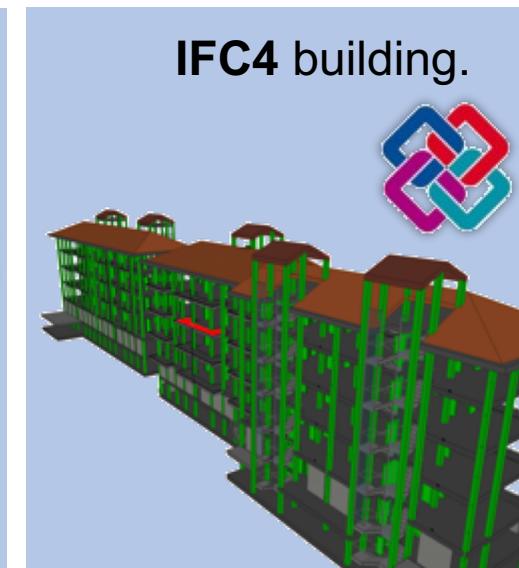
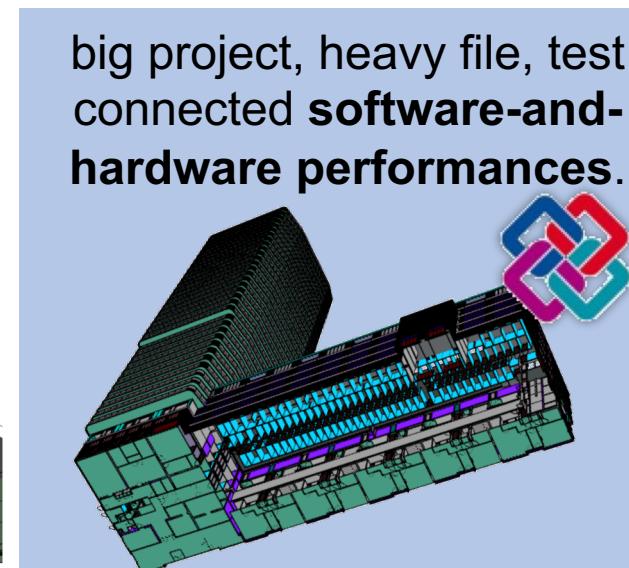
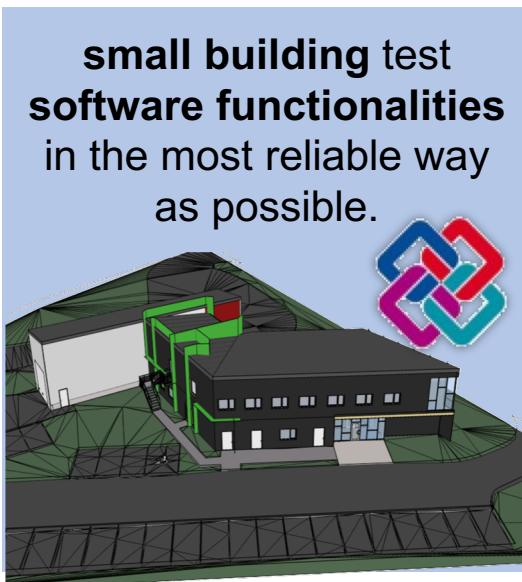
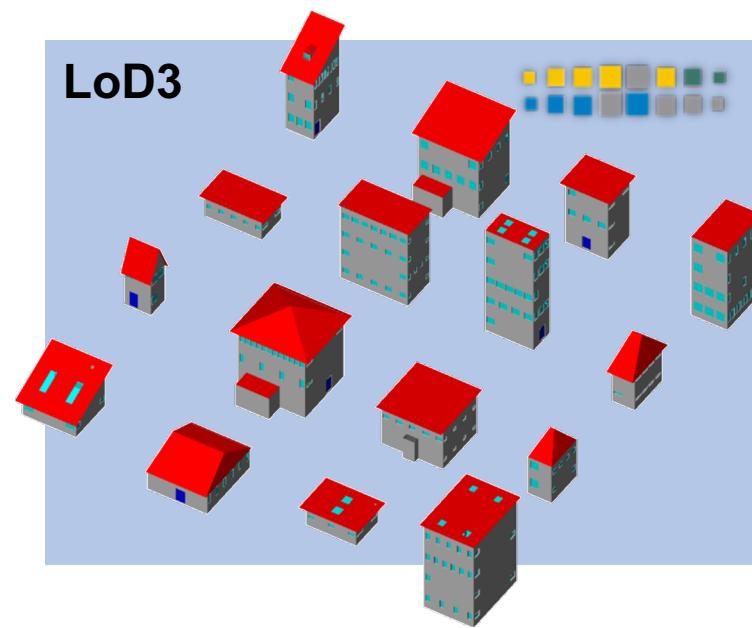
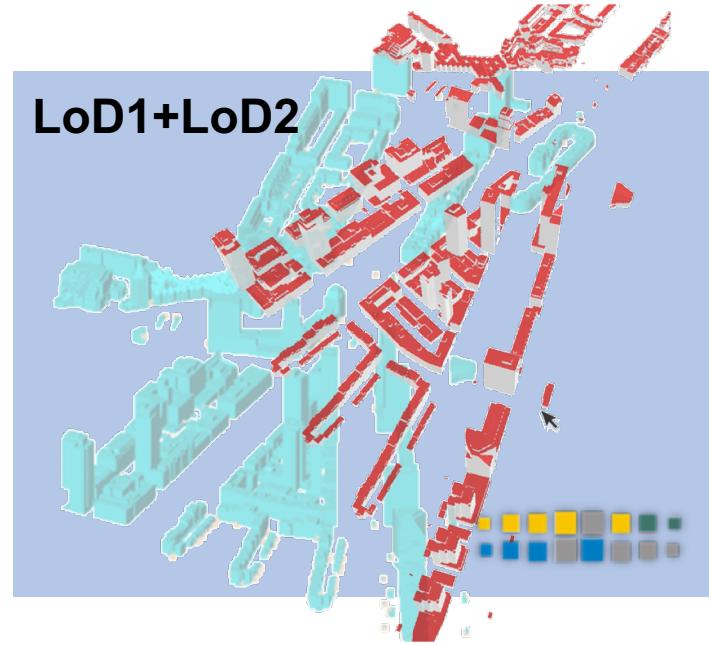
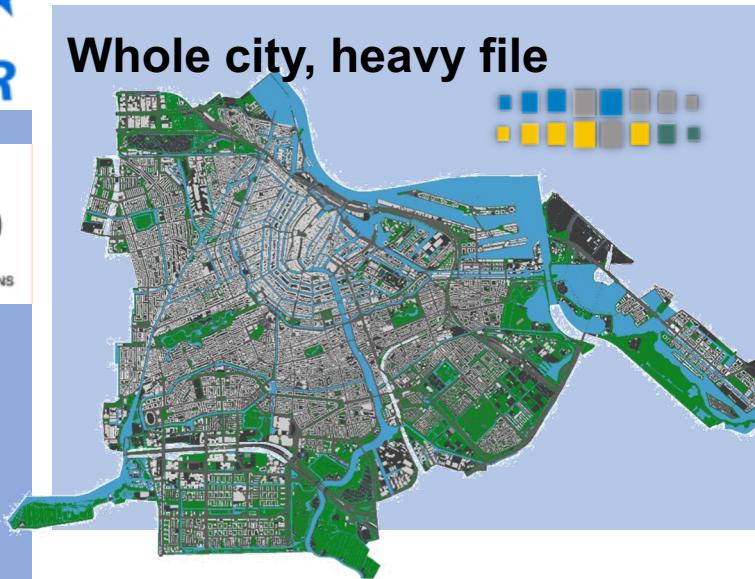
Investigation of the available **technical solutions to support** the open standards IFC (by buildingSMART) and CityGML (by OGC).



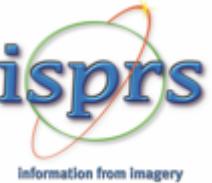
External **voluntary participants** can perform one or more tasks with the tools they are familiar with, and **deliver their results** in the provided **on-line results template**.



The ISPRS-EuroSDR GeoBIM benchmark: provided data



The ISPRS-EuroSDR GeoBIM benchmark



information from imagery

Tasks:



<https://3d.bk.tudelft.nl/projects/geo-bim-benchmark/>



1. What is the **support for IFC** within BIM (and other) software?
2. What options for **georeferencing BIM** data are available?
3. What is the **support for CityGML** within GIS (and other) tools?
4. What options for **conversion (IFC↔CityGML)** are available?



EuroSDR



georeferencing



geometry



semantics



Sw functionalities

The ISPRS-EuroSDR GeoBIM benchmark: numbers

77 participants registered

→ Large interest awarded!

41 participants delivering results

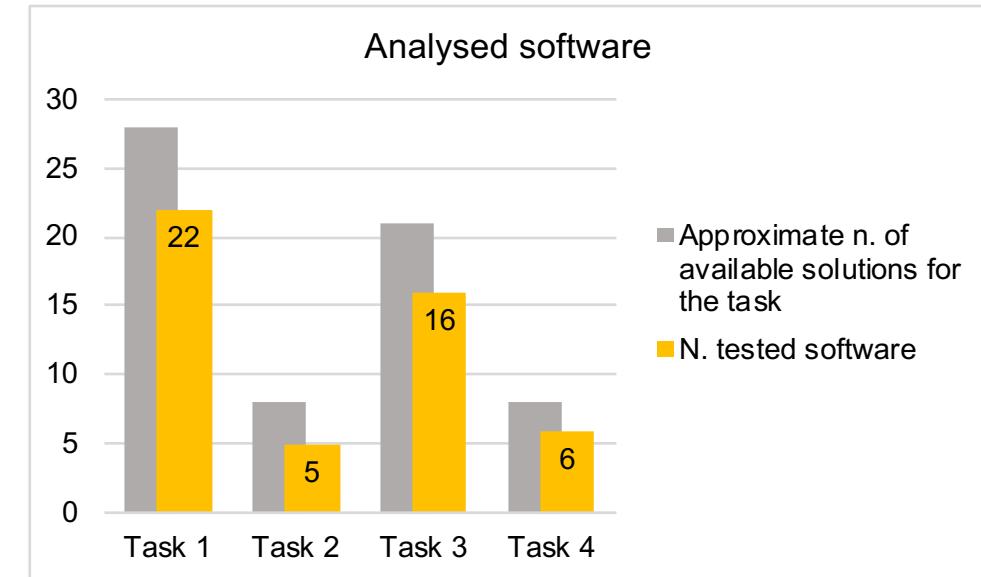
→ Good voluntary response



Registered participants from 19 Countries

Outcomes:

- List of tools / guidelines and best practices, as a reference to use standardized data
- Report on main open standards issues
- Report on main software issues

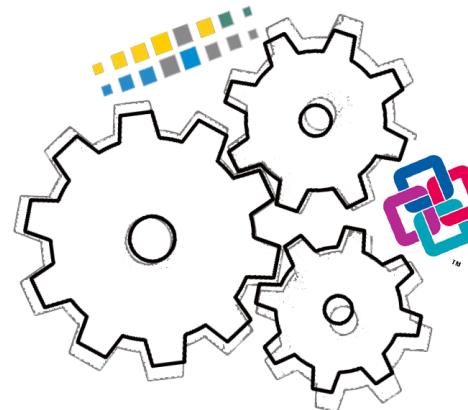


Delivered Results:

- **Integrated** by testing the missing software
- **Analysed** to provide the final outcomes
- Will be **published** in the coming months

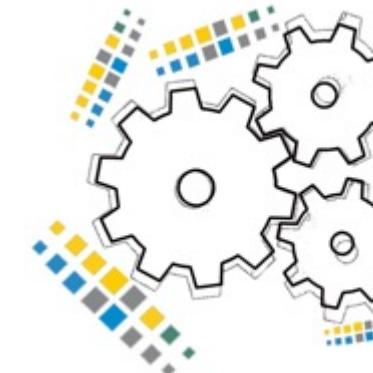
<https://3d.bk.tudelft.nl/projects/geobim-benchmark/>





Today: Task 1 & 3

3D city models interoperability
(OGC CityGML open standard)



BIM interoperability (buildingSMART Industry Foundation Classes – IFC open standard)



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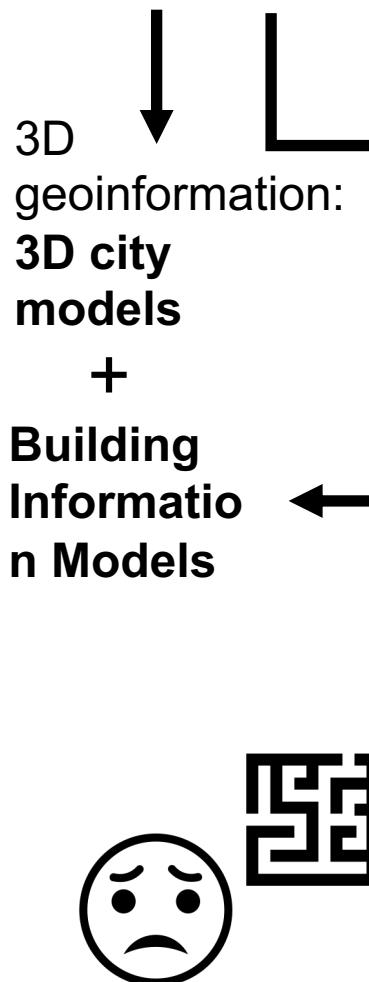
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- h. 15.00-15.45 Task 4: tools for IFC to CityGML or IFC to CityGML [Lead by Jordi van Lierop]
- h. 15.45-16.00 Conclusions, Visions & Next plans.

<https://3d.bk.tudelft.nl/projects/geomim-benchmark/events.html>

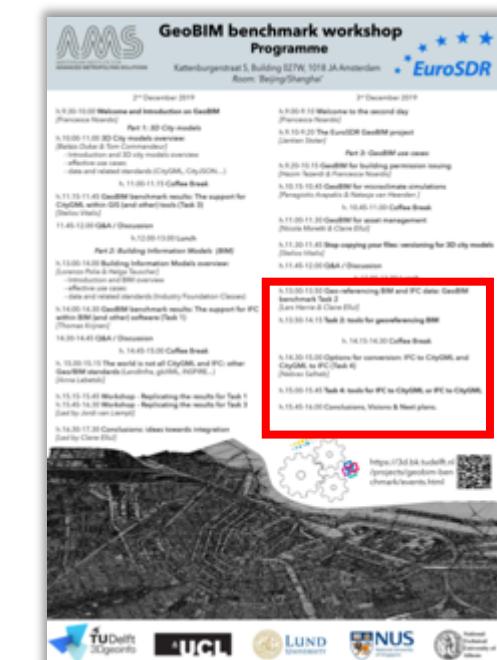
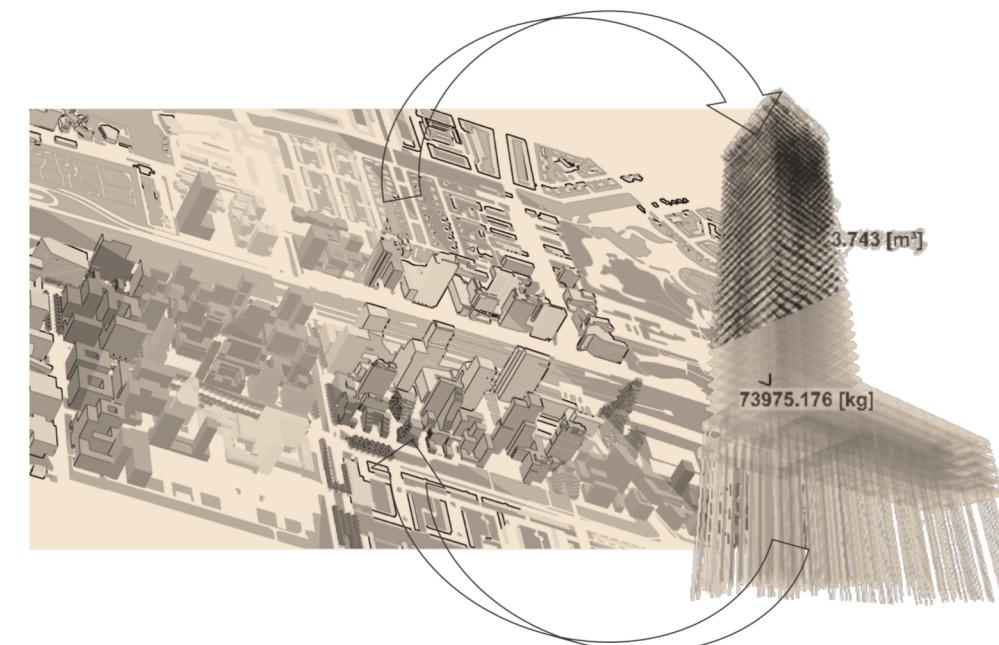


Tomorrow: Task 2 & 4 & more...

GeoBIM = integration of geoinformation with BIMs



1. Integration of **data** (common characteristics, they fit together)
2. Data **interoperability**
3. Reliable **conversion procedures**
4. Integration of **procedures** (BIM and GIS tools)



Ready, steady, GO!

