



Using BIM Bots for Quality Checking

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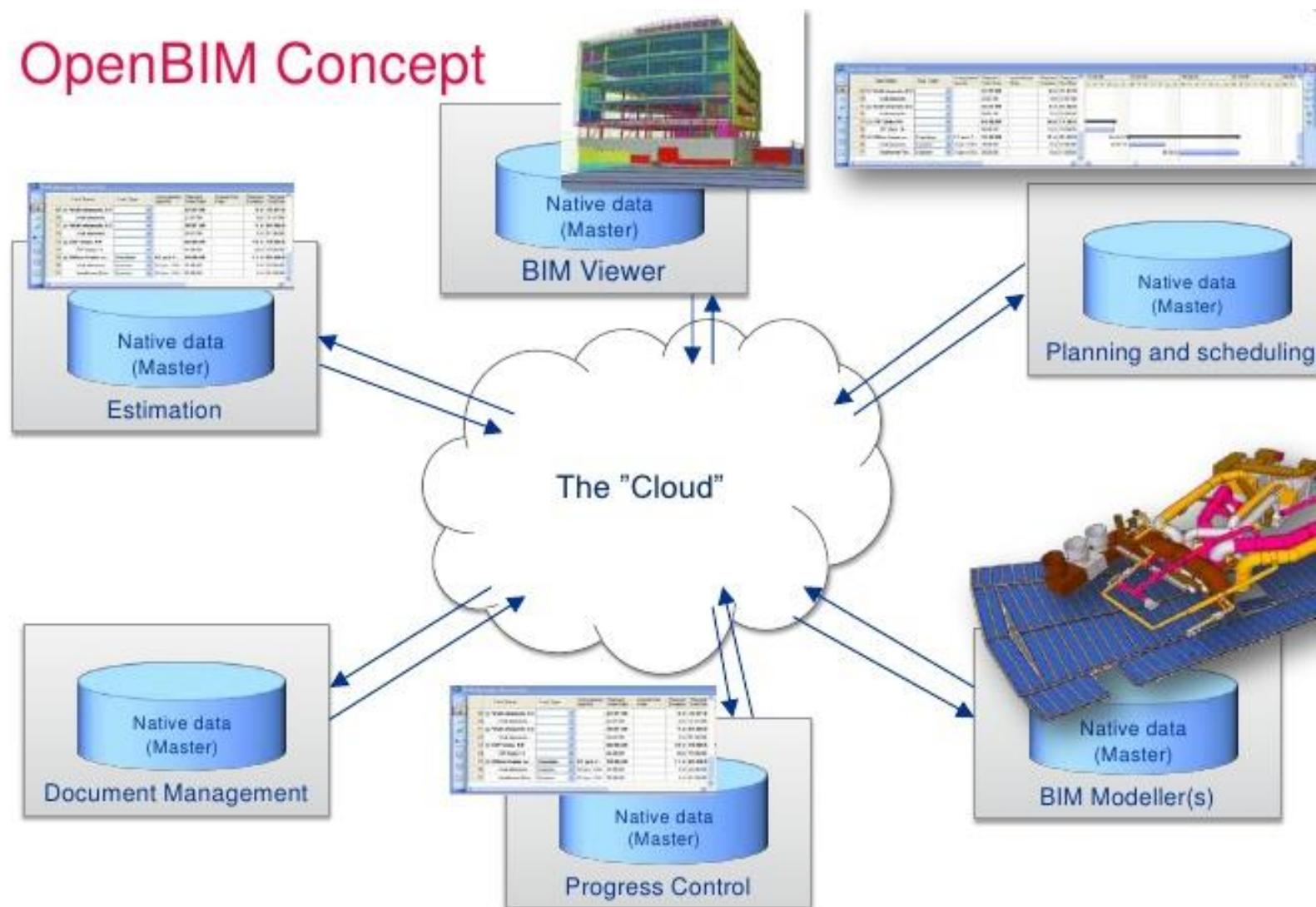
www.built2spec-project.eu



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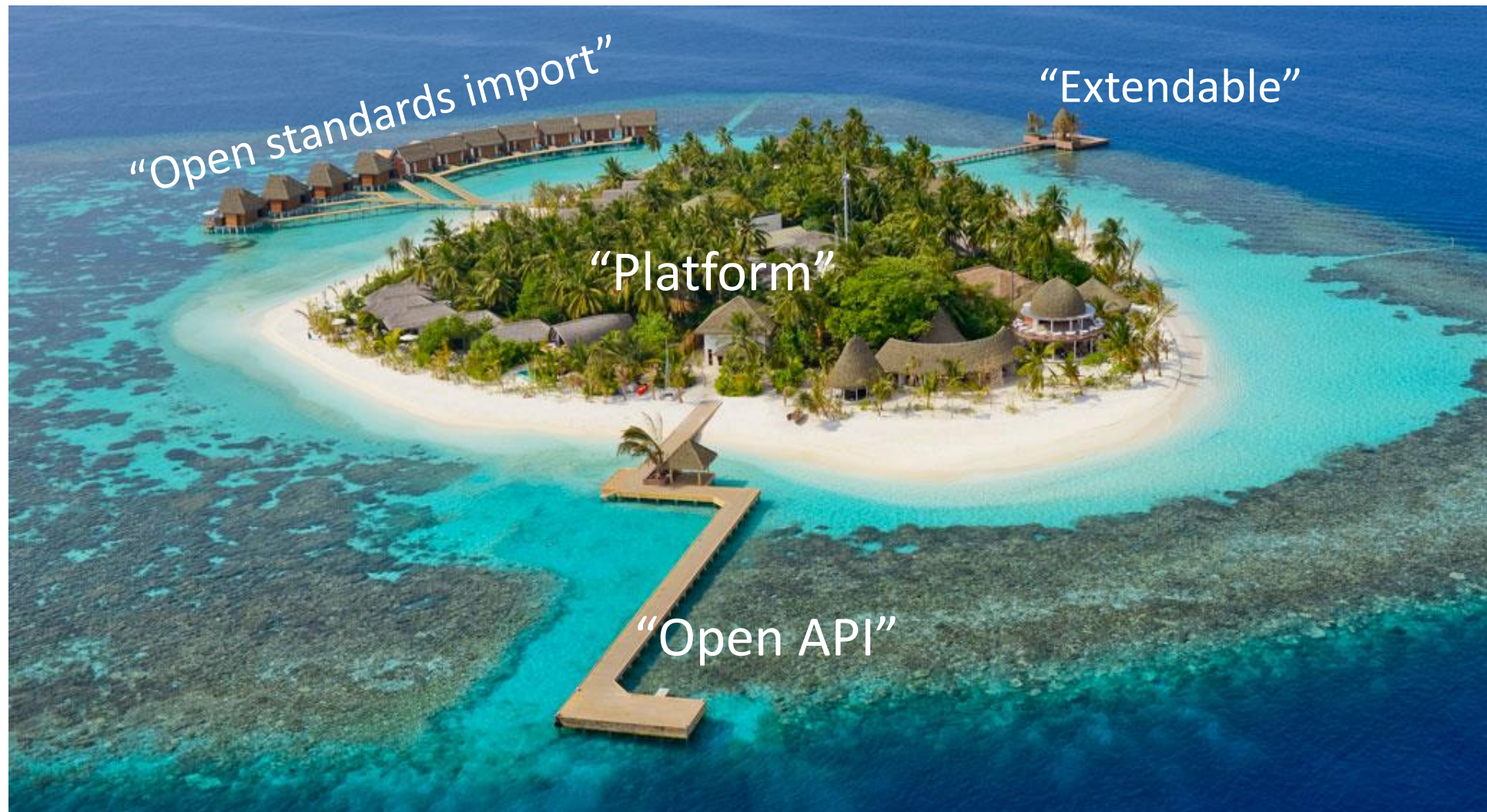
OpenBIM Concept





OpenBIM Concept









AUTODESK® 360

bmsync

Trimble Connect

GRAPHISOFT
BIMcloud

Jotne

bim

IFC
hub



Never a good match

Comparison of 'islands'

List of features on the left

×	✓	✓	×
×	✓	✓	?
Limited (only 2)	✓	✓	✓
×	×	✓	?
✓	×	✓	?
✓	✓	×	?
✓	×	×	?
✓	✓	✓	×
×	✓	✓	✓
✓	×	×	✓
×	×	×	✓
✓	×	×	✓
×	✓	✓	✓



The situation

- 📱 *“perfect and easy collaboration when you are on our island!”*
- 📱 You can only use the features of your island
 - 📱 No crossing over to the other island for that one cool feature they have!
- 📱 Some features will never be on your island....



A solution

- 📱 Microservices / macros / whatever...
- 📱 “Bots”
- 📱 Small niche applications
- 📱 Might not even have a user interface
- 📱 Subscribed to an event: Waiting till they can perform an automated task
- 📱 Triggered when an event happens
- 📱 Every ‘feature’ can be/have a bot (or more than one)





Video's

 Bimbots.org

 <https://www.youtube.com/channel/UCpGvUKrLcxXZV4ismSXZkmw>

 *What are BIM Bots?*

 *BIM Bots for simulations*



Example in Built2Spec

Airtightness test

Create task

Get info needed

Add extra info

Perform task

Store/view results





Example in Built2Spec

Airtightness test

 the stage of the construction



Create task

Get info needed

Add extra info

Perform task




Store/view results





Example in Built2Spec

Airtightness test

-  volume of the 'conditioned part' of the building
-  area of the surrounding envelope of that conditioned part
-  building identifier like address or geo coordinate

Create task

Get info needed

Add extra info

Perform task

Store/view results





Example in Built2Spec

Airtightness test

 the predefined air tightness level?



Create task

Get info needed

Add extra info

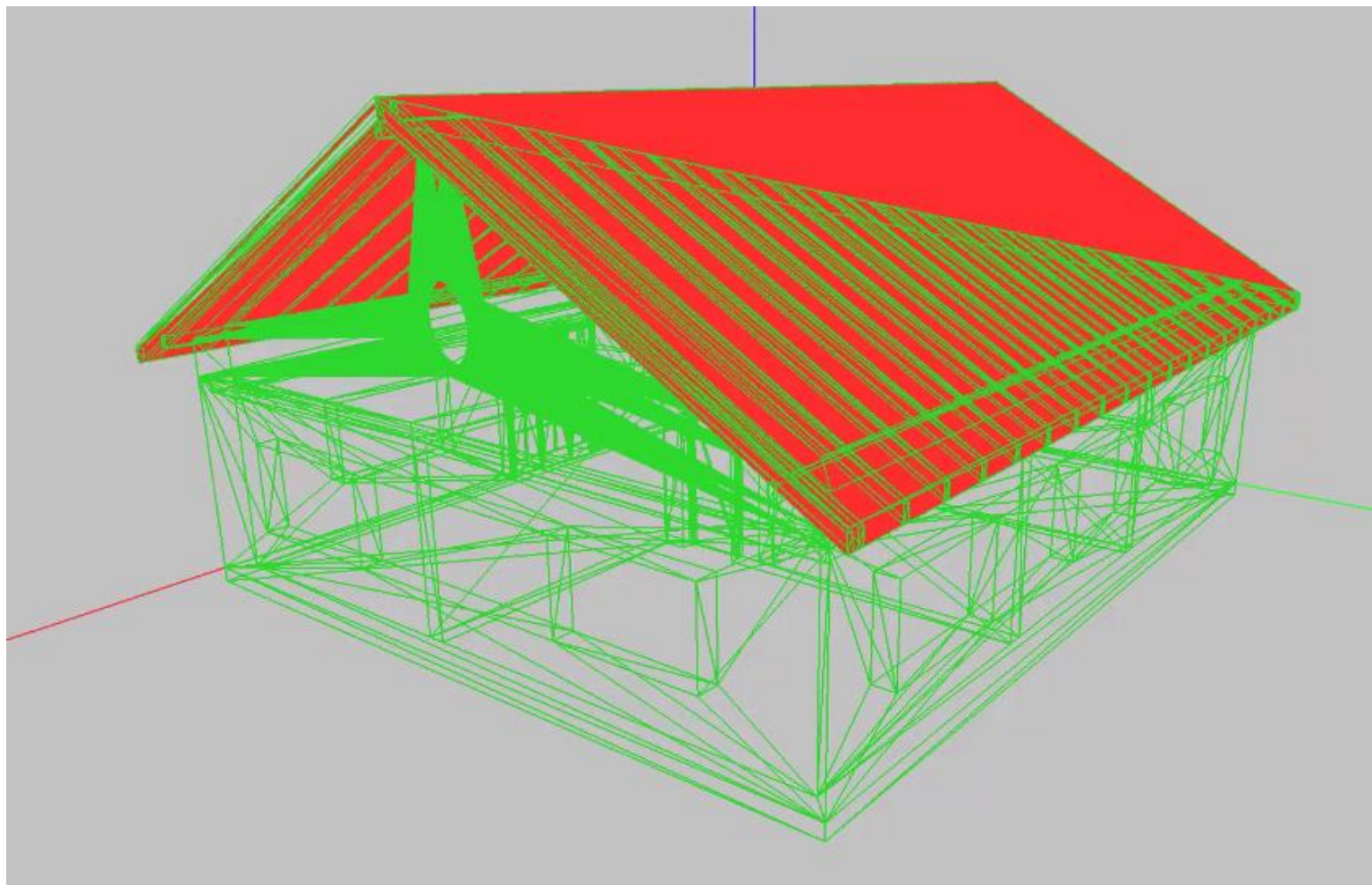
Perform task

Store/view results





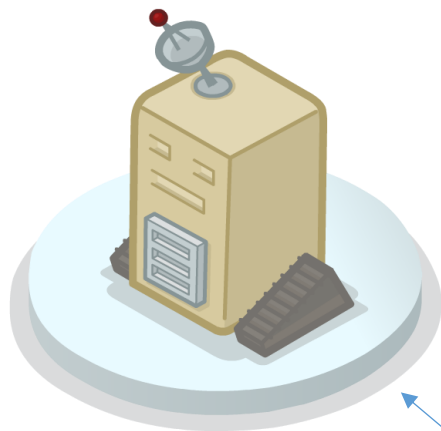
Outer Area calculation



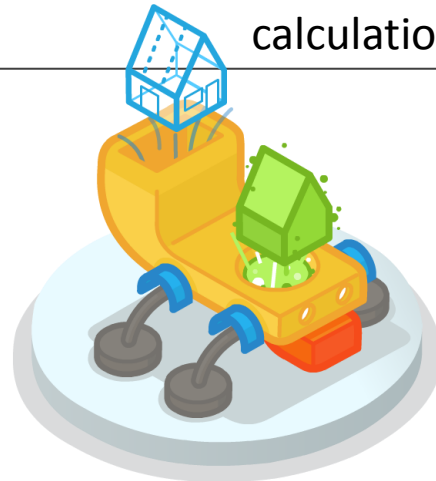
volume of the 'conditioned part' of the building	<p>The 'conditioned part' needs to be identifiable in the IFC dataset. This can be done using classifications or using 'zones'. In Built2Spec we propose to use 'IfcZone'.</p> <p>An IfcZone is an aggregation of spaces, partial spaces or other zones. IfcSpace's are aggregated into an IfcZone by using the objectified relationship IfcRelAssignsToGroup as specified at the supertype IfcGroup.</p> <p>By using 'IfcZone', the Pset_ZoneCommon is a standardized set of properties that can be linked to the defined zones.</p> <p>Two properties in this set are 'GrossAreaPlanned' and 'NetAreaPlanned' that describe the total planned net and gross area for the zone.</p>
area of the surrounding envelope of that conditioned part	<p>The area of the surrounding envelope will be calculated by an algorithm in one of the BIM tools. This data is not explicitly stored in the IFC data, but derived using a software tool.</p>
building identifier, e.g. address or geo coordinate	<p>It is an option to use the IfcAddress (connected to the building) object type or SiteAddress property (connected to the site) for this. However, since addresses are not standardized most of the time, we recommend to use RefLatitude, RefLongitude, and RefElevation to store the geocoordinates of the site. Lat and lon are defined as integer values for degrees, minutes, seconds, and, optionally, millionths of seconds with respect to the world geodetic system WGS84.</p>



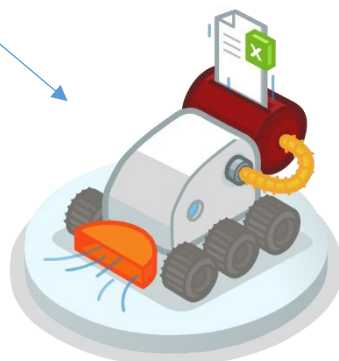
Outer area &
room volume
calculation



vcmp



validation



Test database



Integration in VCMP

BUILT2SPEC

Powered by Refurbilly

Denton Tower, Camden

DETAILS PROPERTIES PROJECTS **BIM** DOCUMENTS FOLDERS

IMPORT IFC

Details Tree Types

IfcWallStandardCase

Name	Value
GlobId	36ezQXejX8ieWKAzxeGBq
Name	Basic Wall 300mm Existing Brick Wall:384564
Tag	384564

Constraints

Value	
0	
false	
0	
true	
false	
Finish Face: Exterior	
0	
false	
0	
0	
Level: 17 Seventeenth Floor Level	
Level: 18 Eighteenth Floor Level	
Unconnected Height	2511.77304476728

Dimensions

Levels

- ✓ 08 Eighth Floor Level
- ✓ 09 Ninth Floor Level
- ✓ 10 Tenth Floor Level
- ✓ 11 Eleventh Floor Level
- ✓ 12 Twelfth Floor Level
- ✓ 13 Thirteenth Floor Level
- ✓ 14 Fourteenth Floor Level
- ✓ 15 Fifteenth Floor Level
- ✓ 16 Sixteenth Floor Level
- ✓ 17 Seventeenth Floor Level
- ✓ 18 Eighteenth Floor Level
- ✓ 19 Nineteenth Floor Level
- ✓ 20 Twentieth Floor Level
- ✓ 21 Twenty First Floor Level
- ✓ 22 Top Roof Level

Details Tree Types

Levels

- ✓ 08 Eighth Floor Level
- ✓ 09 Ninth Floor Level
- ✓ 10 Tenth Floor Level
- ✓ 11 Eleventh Floor Level
- ✓ 12 Twelfth Floor Level
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- ✓ 14 Fourteenth Floor Level
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- ✓ 17 Seventeenth Floor Level
- ✓ 18 Eighteenth Floor Level
- ✓ 19 Nineteenth Floor Level
- ✓ 20 Twentieth Floor Level
- ✓ 21 Twenty First Floor Level
- ✓ 22 Top Roof Level



Conclusions

- ❏ Centralisation (“islandisation”) of data and systems is a lost fight
- ❏ In a fragmented industry; with fragmented responsibilities; a solution that supports fragmented systems works better
- ❏ Using proprietary systems or data is possible with BIM Bots



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