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WORKING GROUP

Building Information Modelling

Current Developments and Challenges

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INTERNATIONAL WORKSHOP
DIGITAL INTEGRATED STRATEGIES TO SAFEGUARD HERITAGE CONSTRUCTION TECHNOLOGIES
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spc

Università di Catania

The Cyprus Institute
Research · Technology · Innovation

UIH Lab
Urban Innovative & Heritage Laboratory

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Content

BIM: Current developments and challenges

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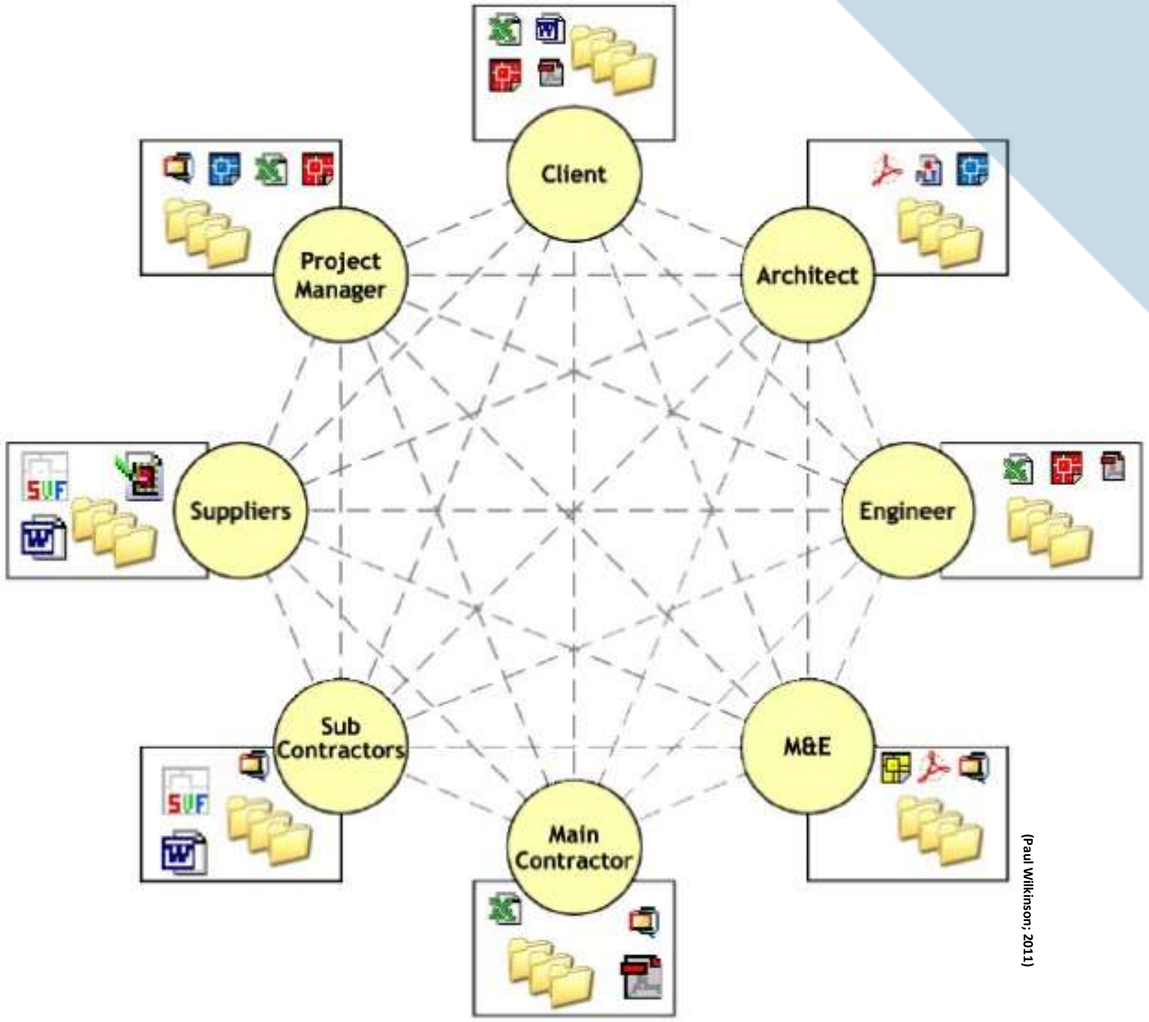
1

Concepts and general aspects

The AECO Industry (AECO)

Architecture, Engineering, Construction, Operations

The traditional collaborative processes



(Paul Wilkinson; 2011)

Disadvantages:

- Disorganized work;
- Sequenced processes - waiting times;
- Faulty communications;
- Lack of information sharing.

Consequences:

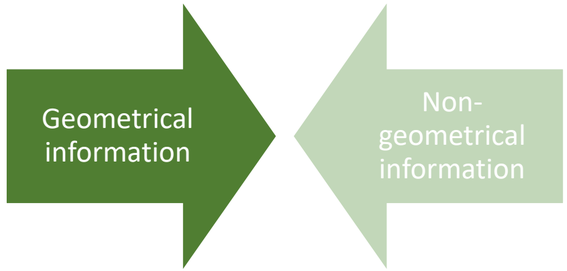
- Errors in design.
- Inefficiency

The need and purpose of BIM

Building Information Modelling

"If an image is worth more than a 1000 words, a model is worth more than a 1000 images."

BIM is a methodology for information sharing and communication between all stakeholders and all the stages of the lifecycle of a construction, which is supported in a digital model, that is accessible through software and allows the virtual manipulation of the construction.



Why now, and not before?

. *Hardware*

. *Software*

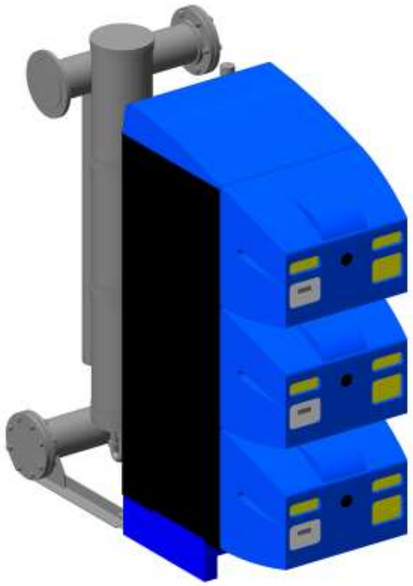
. *Interoperability*

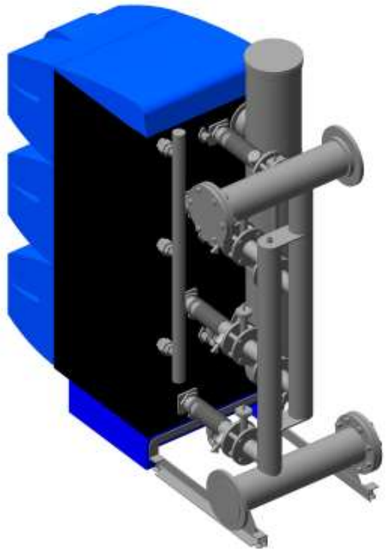
. *Standards and normalization*

. *Market demand*

. *Government demand and awareness*

Object-oriented modelling



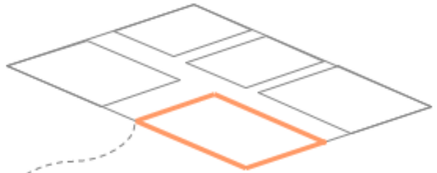


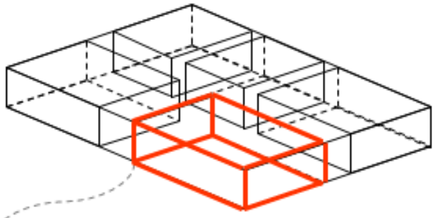
Hamworthy
Heating *at work.*

Emphasis on data/information

Evolve into BIM

"Rectangular Shape" in a CADD model → "Space Object" in a BIM model





"Office" Labeled Polygon

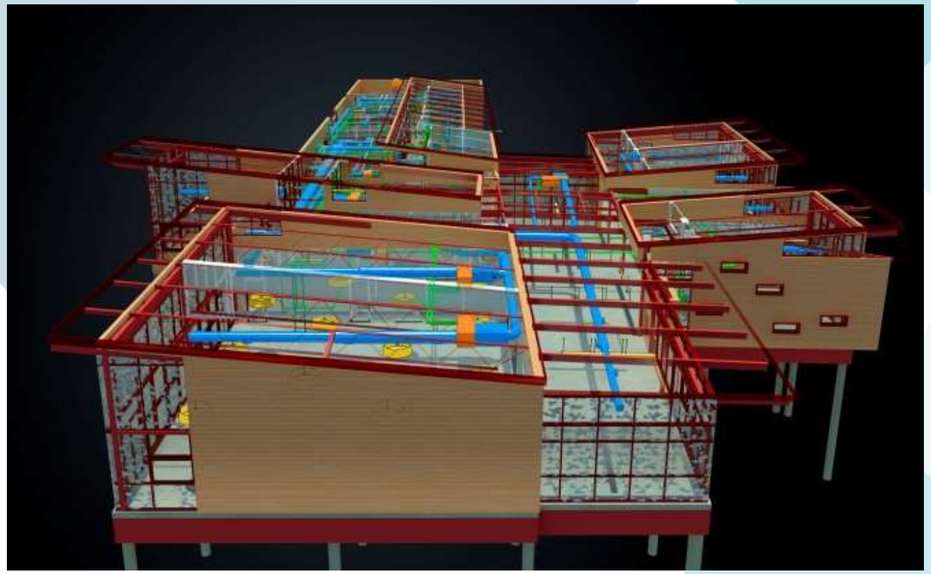
Label Text: "Office"
Layer Label Text: "Level 1"
2D or 3D Dummy Geometry

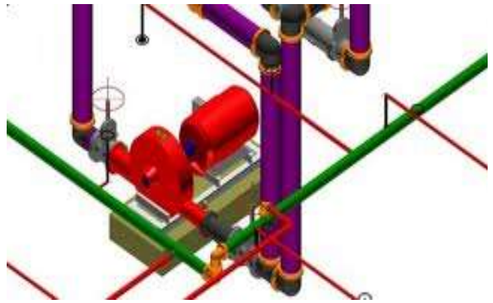
→ **No circulation-related data**

***IfcSpace* Instance**

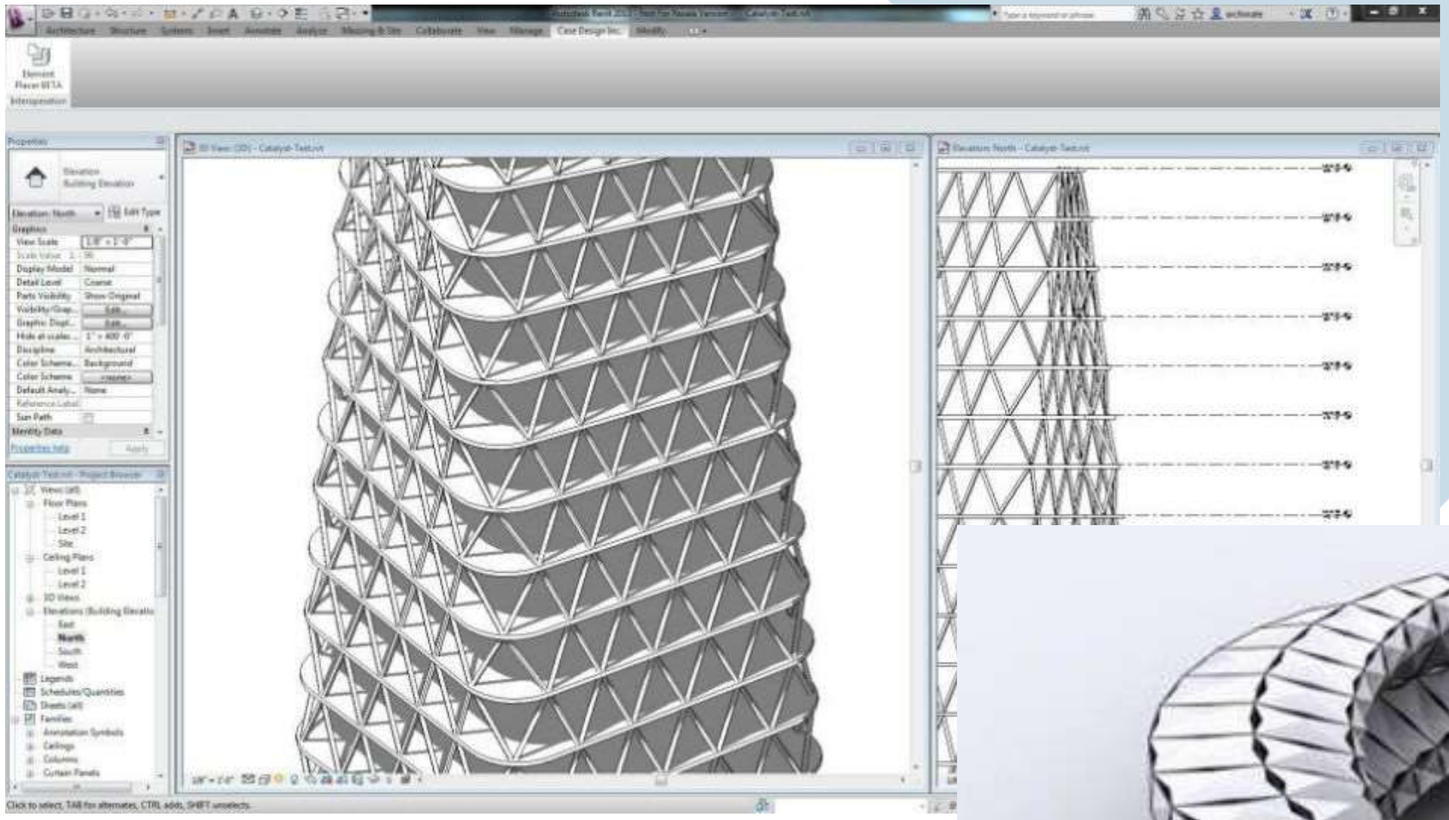
GUID
Name: "Office"
Zone Name: "Leasing Spaces"
Space Number: 250
Floor, Spatial Topology
NET Area, Height, Volume…
Relations, Topology Data
3D Geometry Data
Standard Names
Standard Area, Required Area
Basic Rentable Area
ANSI/BOMA Category
Occupants Code
Energy Zone Type
Cost Estimate Data
Security Information
……

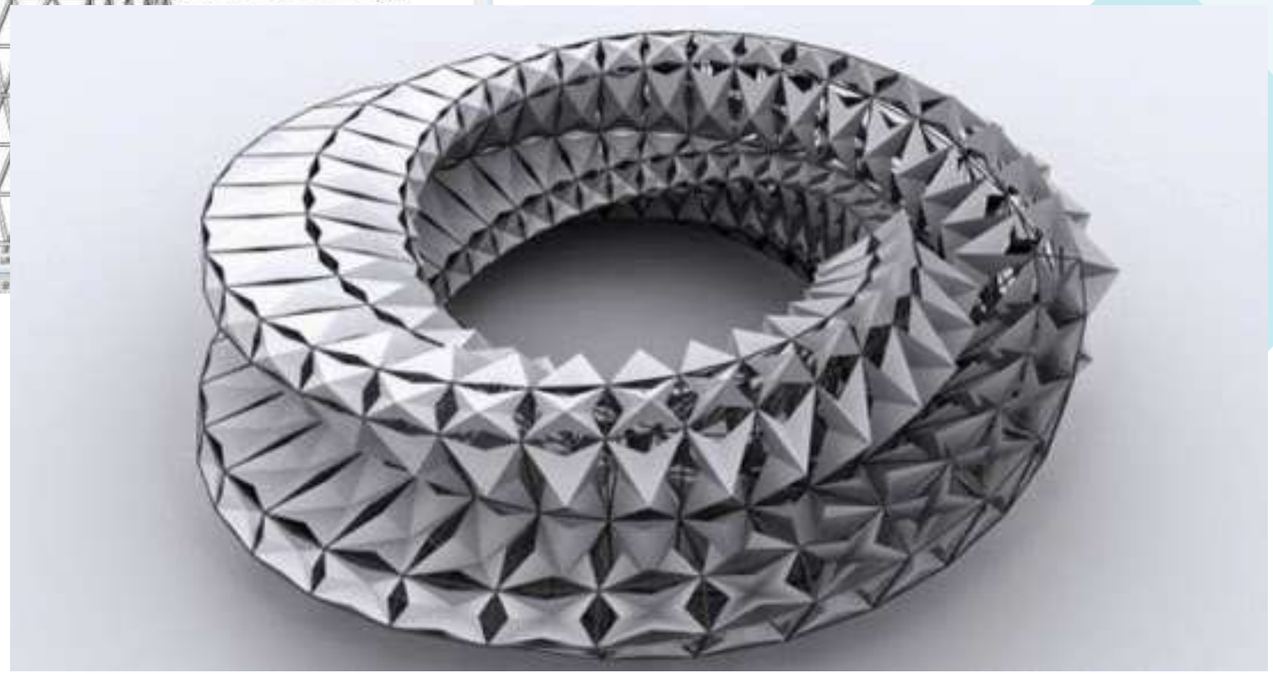
Data set that is applicable to BIM-enabled circulation modeling and representation



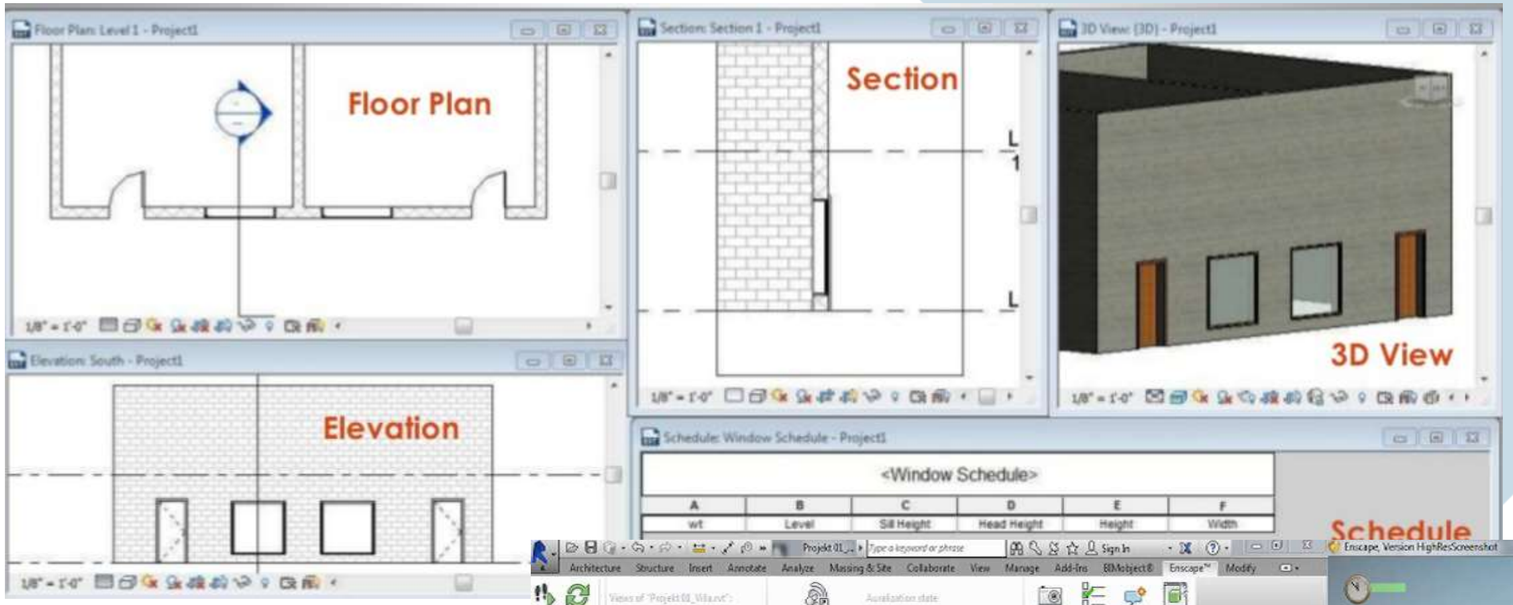


Parametric modelling

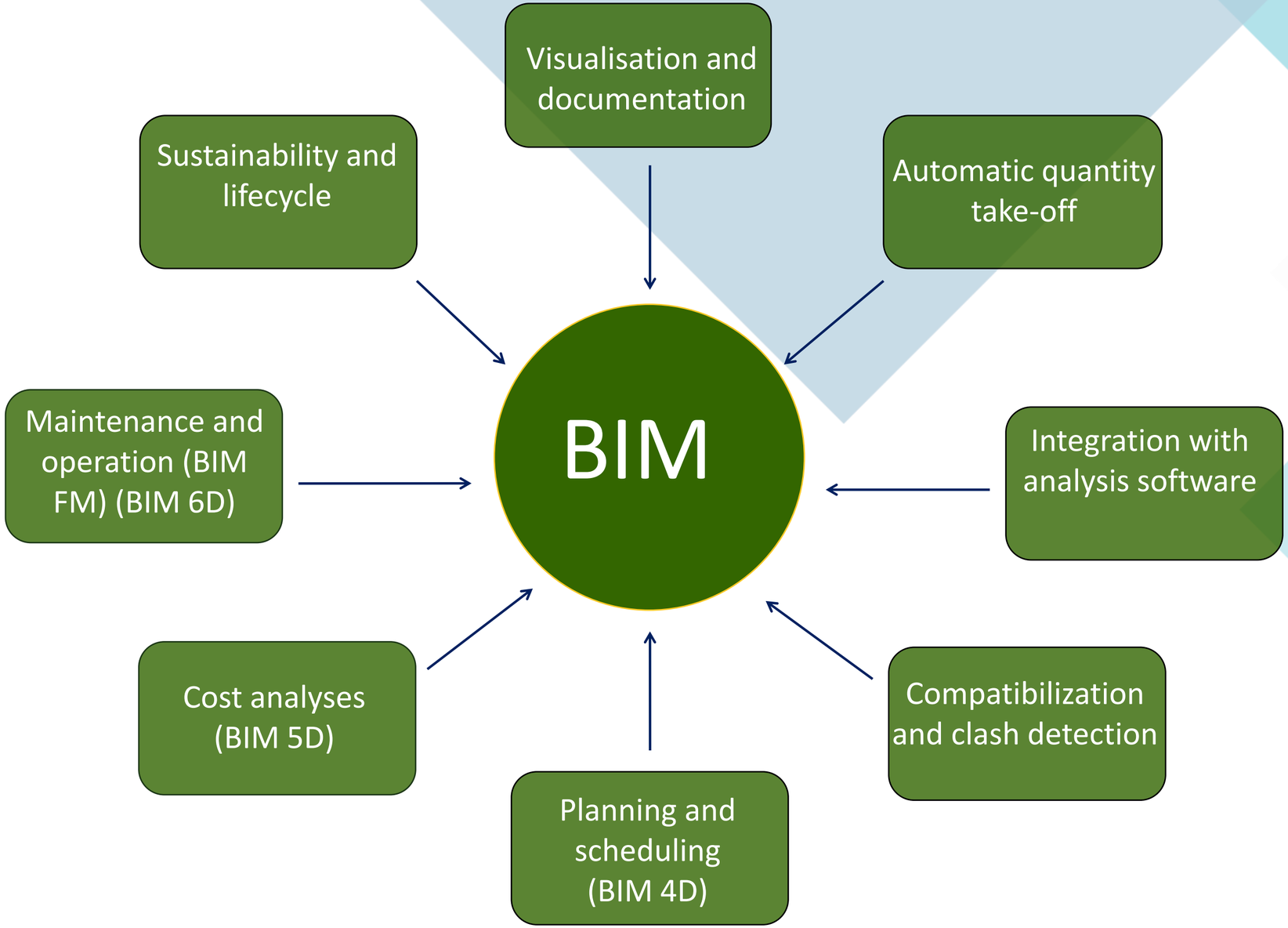




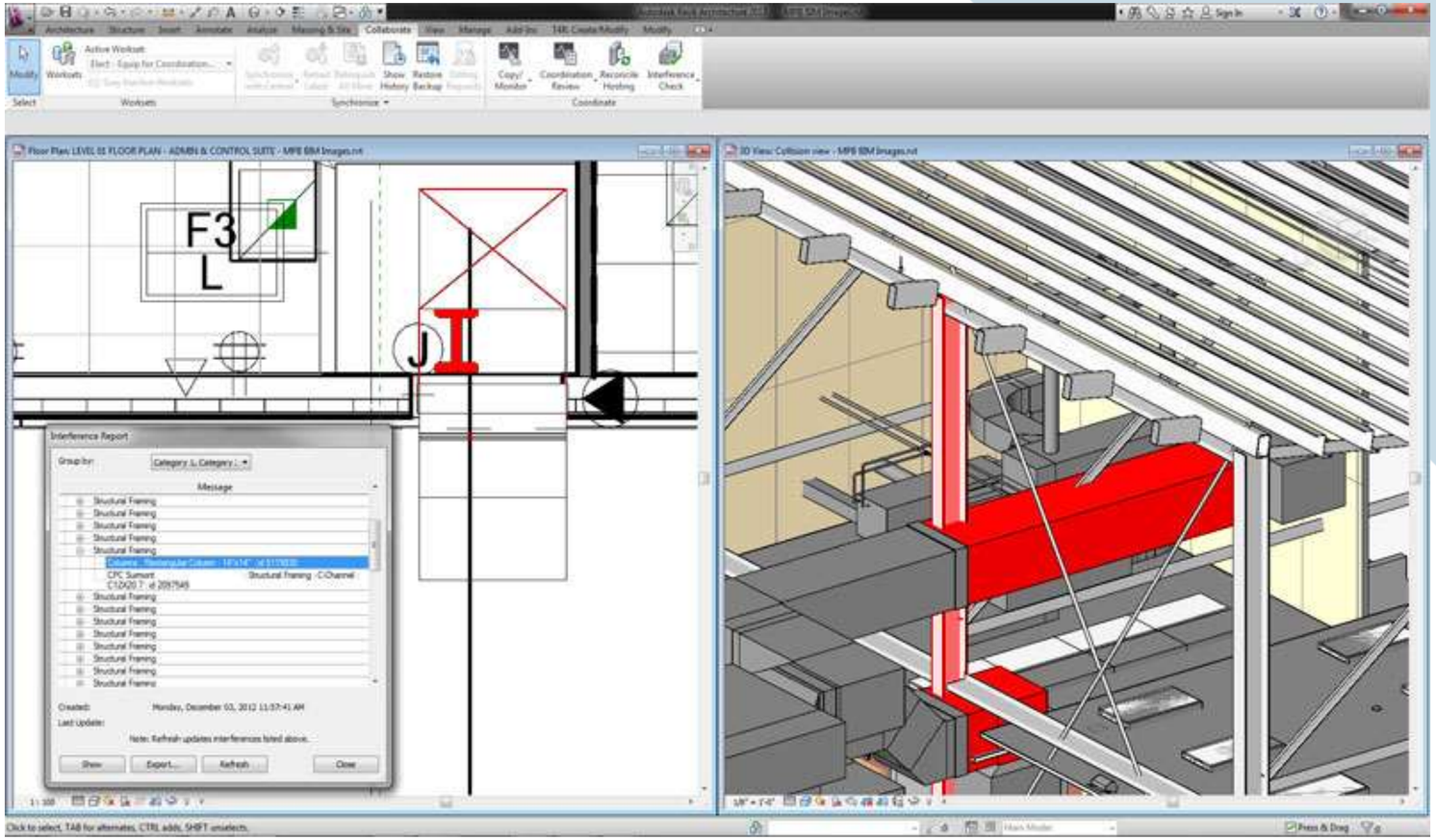
Working in a BIM platform

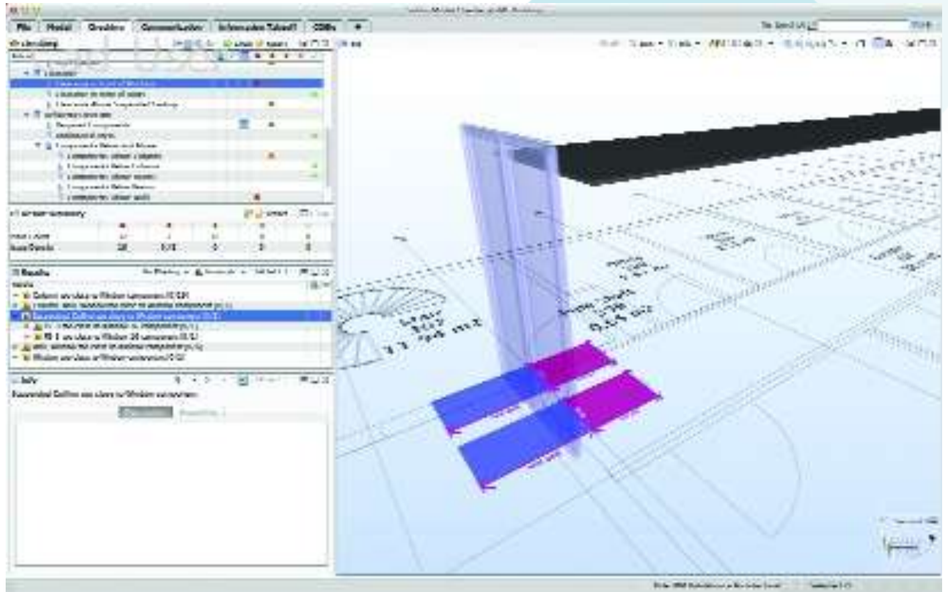


Functionalities and potentialities of BIM

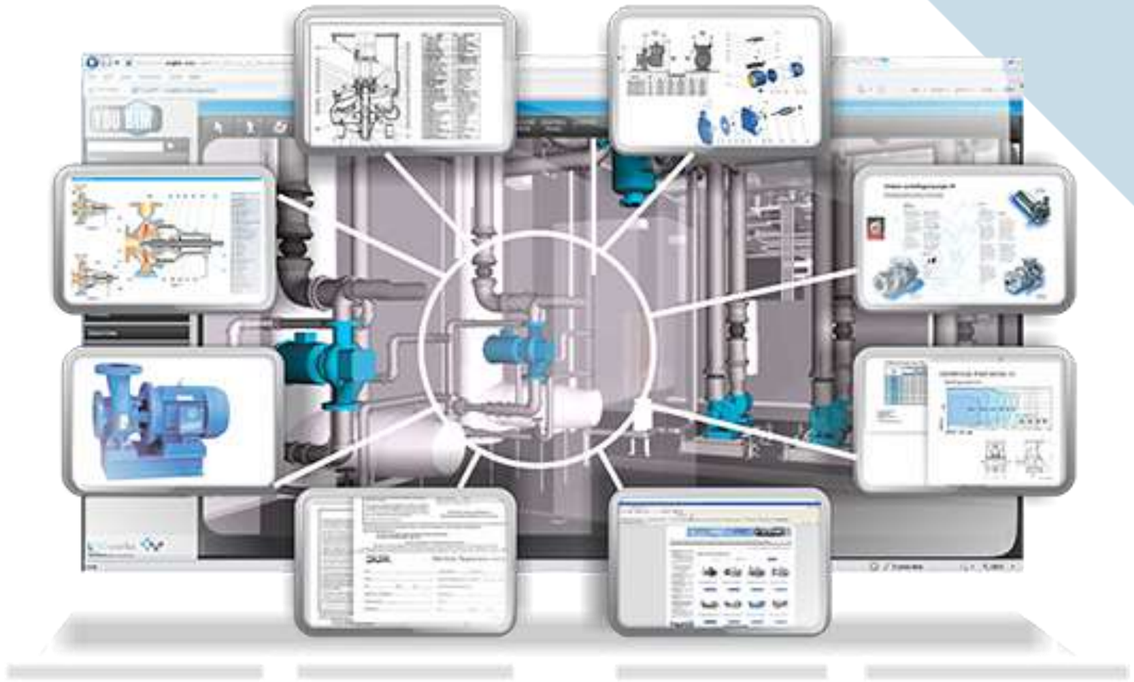


Enhanced collaboration



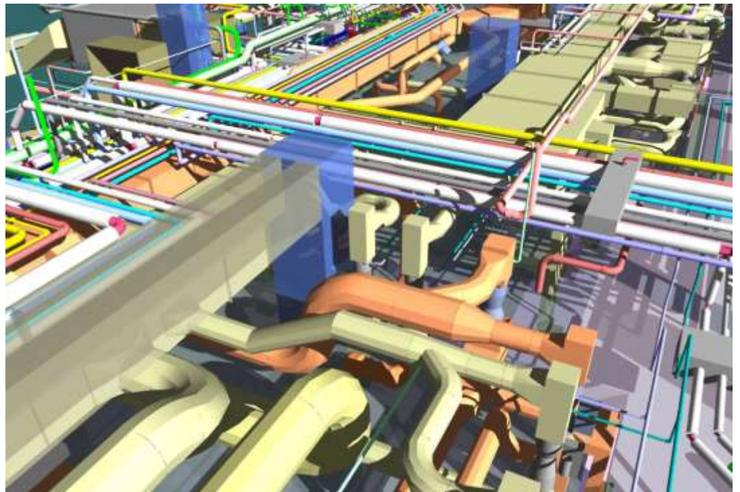


Facilities management



Advantages:

- Faster information sharing;
- Improved management of space;
- Simplified maintenance;
- Efficient use of energy;
- Optimization of management cycles;
- Easy simulations.



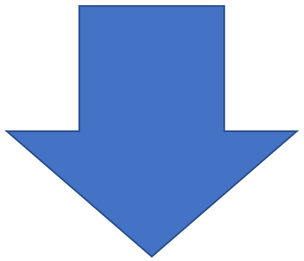
2

Interoperability

Definition and scope

Cambridge Business Dictionary - Interoperability

“the degree to which two products, programs, etc. can be used together, or the quality of being able to be used together.”



It is intended that the need for “manual copy” between distinct computer applications is eliminated, thus accelerating processes and minimizing errors.

buildingSMART International


buildingSMART
International

Professional Certification
Foundation
Basic

This is to certify that José Carlos Lino

has successfully passed the Professional Certification - Foundation Basic exam.

This certificate attests to the knowledge and comprehension of openBIM fundamentals for the named individual and to the level stated above, according to the buildingSMART International Professional Certification Program.

Date: 19 December 2022

Céline Bent, Compliance Director buildingSMART International

Sergio Muñoz, Presidente buildingSMART Spain

Miguel Azenha, Academic Coordinator of CursoBIM TecMinho, Universidade do Minho

Program buildingSMART

Chapter buildingSMART Spain

Provider TECMINHO

buildingSMART International and OpenBIM

Colaborative approach to design, construction and operation of the built environment based on open workflows and open formats.

3

Standardization

Standardization

buildingSMART
International home of openBIM

ISO

ISO/TC 59/SC 3

CEN

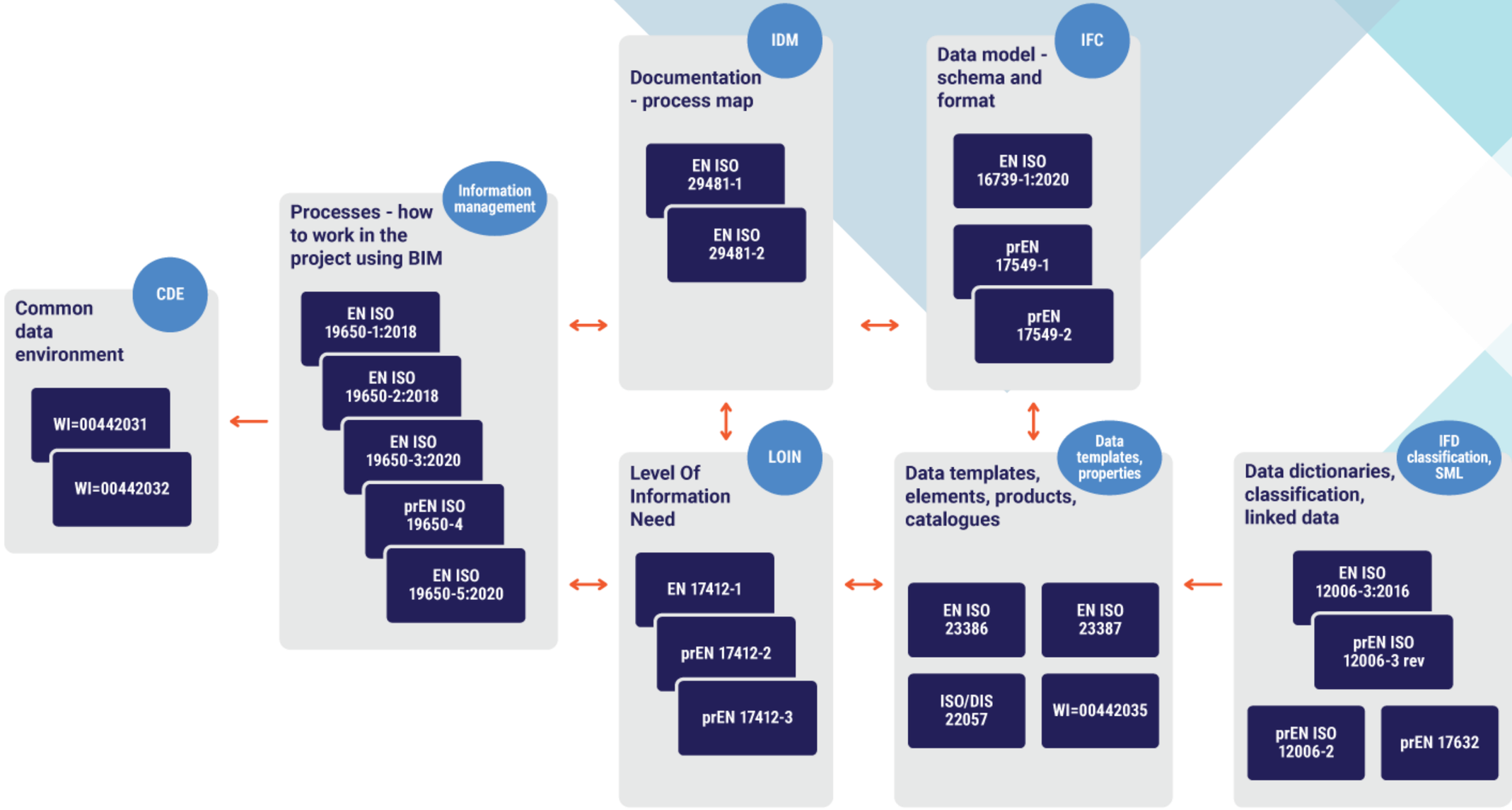
CEN TC 442 BIM

IPQ

NB
CT197 BIM

IPQ CT197- BIM

Standards for information management in construction

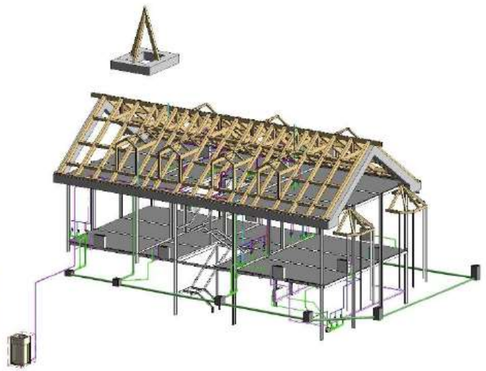


Importance of educating owners, government, markets

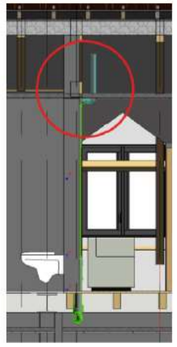
4

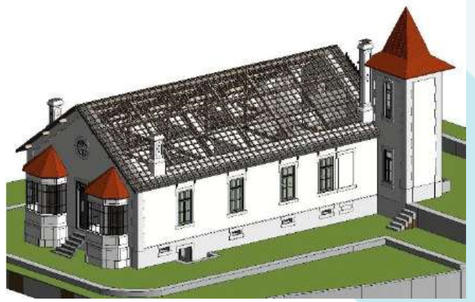
Final thoughts and considerations

Yes, BIM in historic constructions is possible!
Also in Archaeology!



(Campos, 2018)





Yes, BIM in SME's is possible!

BonsaiBIM -> free!

Some final thoughts on possibilities and challenges

. Benefits and viability of BIM have been demonstrated.

. Government and owner awareness increasing.

. Hardware, software, standards, interoperability -> enablers

. BIM in historic constructions and archaeology -> demonstrated

. Challenge to educate people/market (benefits not harvested immediately)

. Data to be stored/available for AI (Ontologies, Semantic web)

Thanks for your attention!

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