

“BIM AND THE FUTURE OF Hellenic Consulting Firms”

Digital Construction and BIM in Greece

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Member of



HELLASCO(ΣΕΓΜ) ACTIONS

- Our members are participating in the design of many major projects using BIM in Greece and abroad
- Participation in EFCA BIM Task force
- Collaboration with ELOT
- Dissemination to our members
- Organization of seminars, conferences
- Offering education
- Creating synergies
- Minimum Deliverables include BIM (HELLASCO participation)



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EFCA BIM TASK FORCE

- To consider initiatives of CEN/TC 442 and related institutions like EU, the European Commission, the European Parliament and other European and international organizations on BIM or related issues
- To organize the follow up of EFCA contribution as liaison to CEN/TC 442, and to other potential related TC
- To contribute to the promotion of an Open BIM, having in view smart building, buildings, constructions and cities
- To monitor EFCA contributions to TC/442 works or other TC for the consulting engineering industry to obtain standardization in line with its own requirements especially
- To control and monitor the way and the tools to exchange its information in BIM
- To consider Open BIM not as a competition, but the way to elaborate the best way to communicate and to increase the exchange processes productivity
- Developing the ISO 19650 booklet



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BIM and ISO 19650 from a project management perspective

Organization and digitization of information
about buildings and civil engineering works,
including building information modelling (BIM)

BOOKLET ON ISO STANDARD 19650 Information management using building information modelling

BIM and ISO 19650

from a project management perspective, ISO 19650 'Part 1: concepts and principles'



KEY

A Start of delivery phase – transfer of relevant information from AIM (Asset Information Model) to PIM (Project Information Model)

B Progressive development of the design intent model into the virtual construction model

C End of delivery phase – transfer of relevant information from PIM to AIM

Information management lifecycle as it relates to ISO standards, according to ISO 19650

BIM and ISO 19650

from a project management perspective, ISO 19650 'Part 1: concepts and principles'

Definitions used in project management

Building Information Modelling

Use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions

BIM Execution Plan

Plan that explains how the information management aspects of the appointment will be carried out by the delivery team

Level of information need

The level of information need is:

Framework that defines the extent and granularity of information.

One purpose of defining the level of information need is to prevent delivery of too much information.

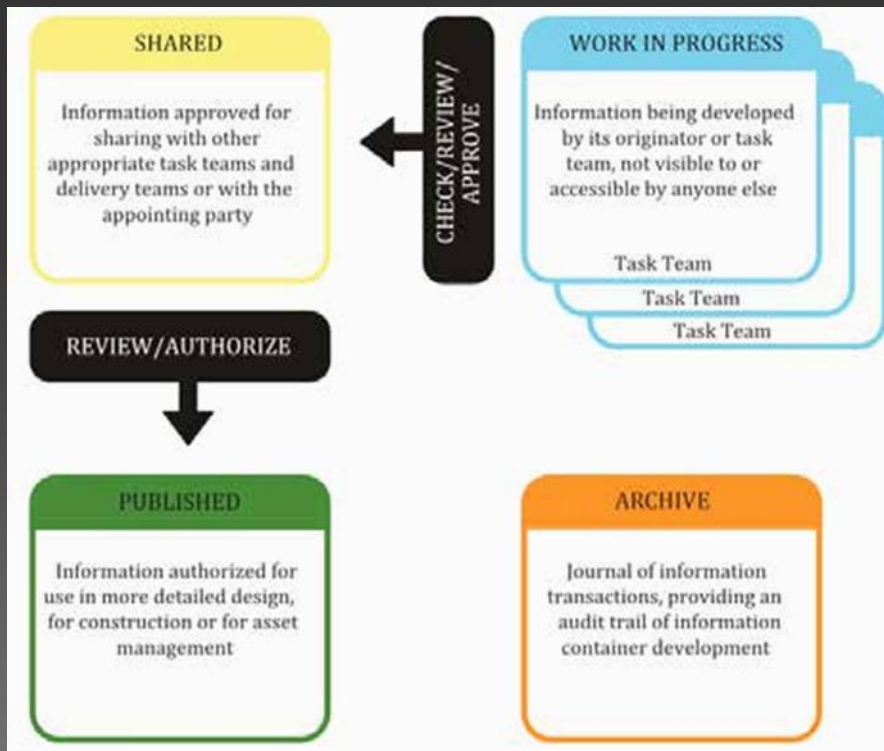
BIM and ISO 19650

from a project management perspective, ISO 19650 'Part 1: concepts and principles'

Two key concepts for consulting engineers

Common Data Environment (CDE)

Agreed source of information for any given project or asset, for collecting, managing and disseminating each information container through a managed process



BIM and ISO 19650

from a project management perspective, ISO 19650 'Part 1: concepts and principles'

Two key concepts for consulting engineers

Requirements management

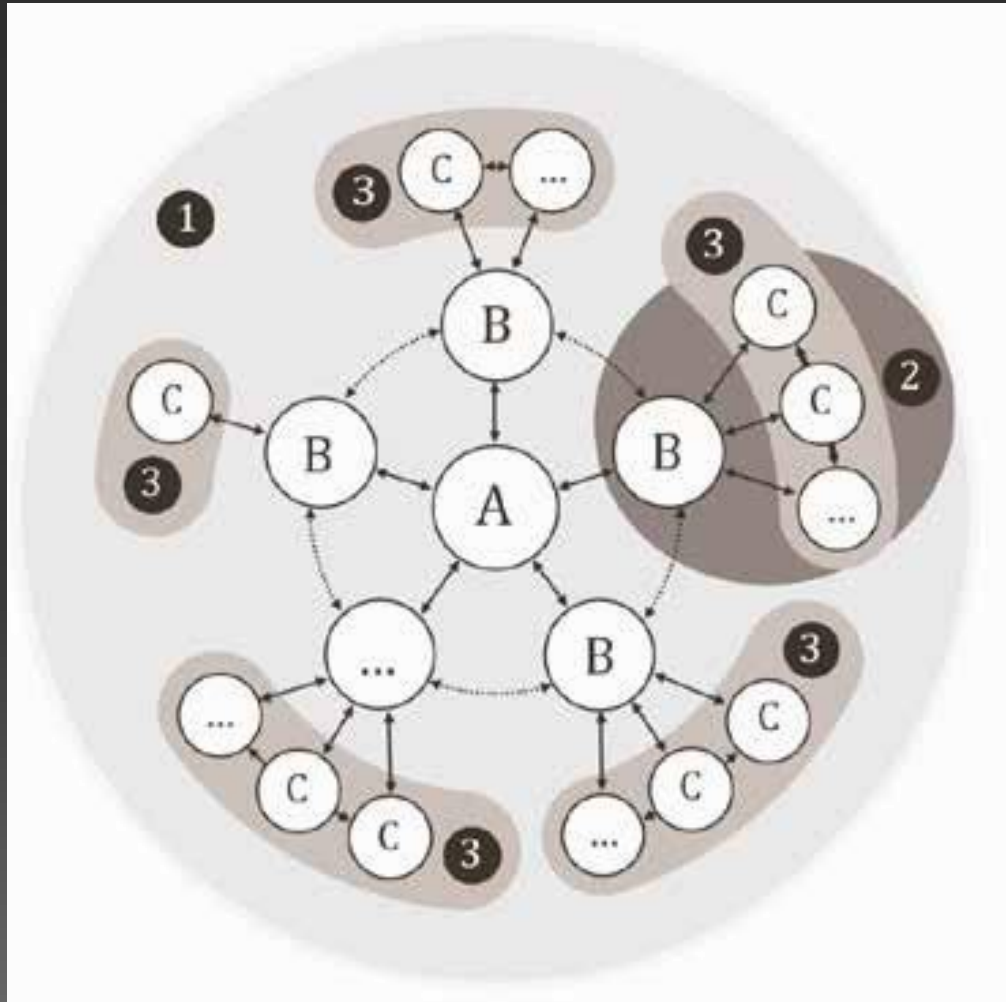
Organisational Information Requirements (OIR) – those pieces of information needed to answer or inform high-level strategic objectives within the asset owner/operator in relation to the built assets owned, operated, used or managed by them.

Asset information requirements (AIR) – those detailed pieces of information needed to answer the organisational information requirements.

Project information requirements (PIR) – those pieces of information needed to answer or inform high-level strategic objectives within the asset owner/operator or project client organisation, in relation to a particular built asset project

BIM and ISO 19650

from a project management perspective, ISO 19650 Part 2: 'Delivery phase of the assets'



Key

- A appointing party
- B lead appointed party
- C appointed party
- ... variable amount

- 1 project team
- 2 illustration of a delivery team
- 3 task team(s)

↔ information requirements and information exchange

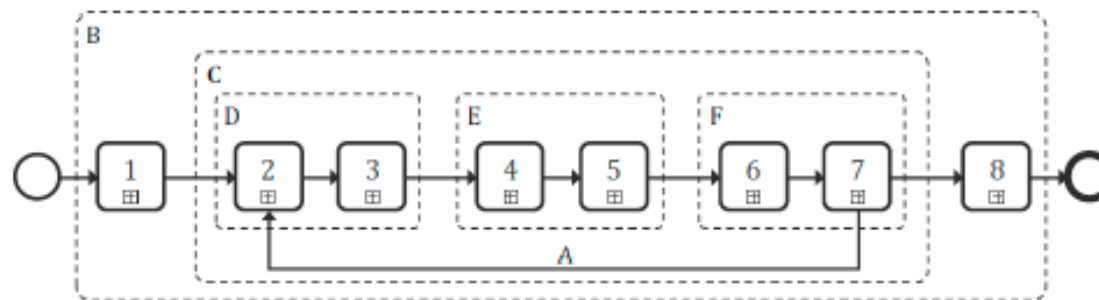
⋯↔ information coordination

Interfaces between parties and teams
for the purpose of information
management (ISO 19650 - Part 2)

BIM and ISO 19650

from a project management perspective, ISO 19650 Part 2: 'Delivery phase of the assets'

The process of delivery, according to ISO 19650 Part 2, Section 4.1 Information management process, is detailed in the figure below.



KEY

- 1 assessment and need
- 2 invitation to tender
- 3 tender response
- 4 appointment
- 5 mobilization
- 6 collaborative production of information
- 7 information model delivery
- 8 project close-out (end of delivery phase)

- A information model progressed by subsequent delivery team(s) for each appointment
- B activities undertaken per project
- C activities undertaken per appointment
- D activities undertaken during the procurement stage (of each appointment)
- E activities undertaken during the information planning stage (of each appointment)
- F activities undertaken during the information production stage (of each appointment)

Figure 5: Information delivery process with Stages 1-8, according to ISO19650 - Part 2

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

The implementation of BIM as a methodology gives the best result by far when the quality of the information deliverables is improved and when the collaboration is enhanced in a structured way and integrated into the project management process.

Processes

- the defined process must allow for developments in the project and any changes this creates to the deliverables, etc.
- the role of the BIM manager depends of the country, the contract, the companies. The role of the BIM manager in a project team varies across companies, It has to be considered as a role, associated to the appointed party in the contract, including the processes of BIM management with the responsibility of the BEP, the information management, the information requirements management, the information workflow management and the information interfaces management. Even, if it is not a full-time activity, a member of the project management team has to be appointed for these responsibilities.
- the importance of defining the process for exchanging information between all stakeholders

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

Processes

The BIM management is to organise the following tasks, and their implementation under the BEP:

- to merge all discipline models
- to check the compliance of the models according to the BEP or other agreement
- to check the evolution of the models and their compliance with the scope of work
- to check for clashes between the models

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

Common Data Environment

The evolving 3D and BIM software can carry out tasks related to:

- document management, including revision control
- access rights to information
- Workflow, logbooks, audit trail, progress control, cost control
- connection to corporate systems, e.g. for financial data
- project communication, e.g. with communication through email, pdf files, etc.
- BIM tools like viewers, clash detection and code checking, etc. (also supports communication between stakeholders)
- up-to-date information take-off
- adding separate graphical and non-graphical information
- maintenance and facility management

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

Exchanging/sharing information in a BIM process

- hierarchy of the information
- intellectual property ownership
- obligations and liabilities of suppliers
- purpose of information exchanges
- roles and responsibilities for information management

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

Effective BIM implementation from a project manager perspective
The four major criteria of any project – **cost, time, quality and risk** – are the main parameters that quantify the success of BIM implementation. From an engineering consultant and project manager perspective, effective implementation of BIM means primarily focusing on using BIM as a tool for staying within the planned budget and timeframe, without clashes and problems in design, unplanned works, reworks, claims, unrealistic deadlines, etc.

BIM deliverables – reusability

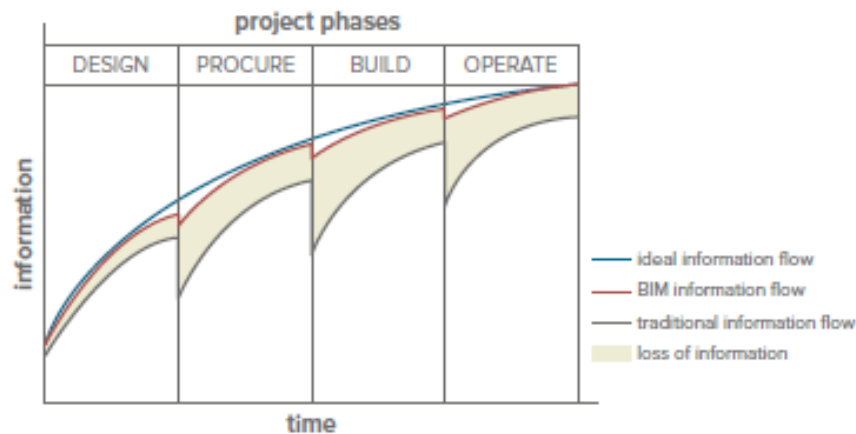


Figure 8. Knowledge base throughout the project lifecycle²⁸

BIM and ISO 19650

from a project management perspective, Important issues for managing BIM

Education and training

Key issues include:

- to calculate a tender and deliver a bid it is necessary to understand the legal and economic implications of what is being requested and which deliverables are to be included;
- to manage a BIM project, it is necessary to understand the new ways of inter- action and deliverables for each stakeholder and how to use BIM technology to manage time, quality, cost and risk;
- to prepare for BIM project execution it is important to appoint a BIM manager for the project to match project setup to the contract requirements and to clarify if anything is not specified;
- a designer needs to learn how to implement more of the information into the model, instead of in separate documents, and to use the model throughout the process. The designer also needs to understand that the model is the main deliverable and therefore must be in the main focus of QA.

BIM and ISO 19650

from a project management perspective, BIM Execution Plan

- BIM Project Execution Plan overview
- project information
- key project contacts
- project goals/BIM uses
- organisational roles/staffing
- software and its versions
- BIM process design
- BIM information exchanges and planning/timing related to these exchanges
- BIM and facility data requirements
- collaboration procedures
- quality control
- technological infrastructure needs
- model structure
- project deliverables
- delivery strategy/contract
- attachments

BIM and ISO 19650

from a project management perspective, BIM Execution Plan

Level of information need

(a) Level of geometry

The geometric precision of the elements represented – which parts of the element can be ignored or simplified and while still keeping the element functional for BIM uses such as clash detection, An object can be represented as a line, a surface or a solid.

(b) Level of information

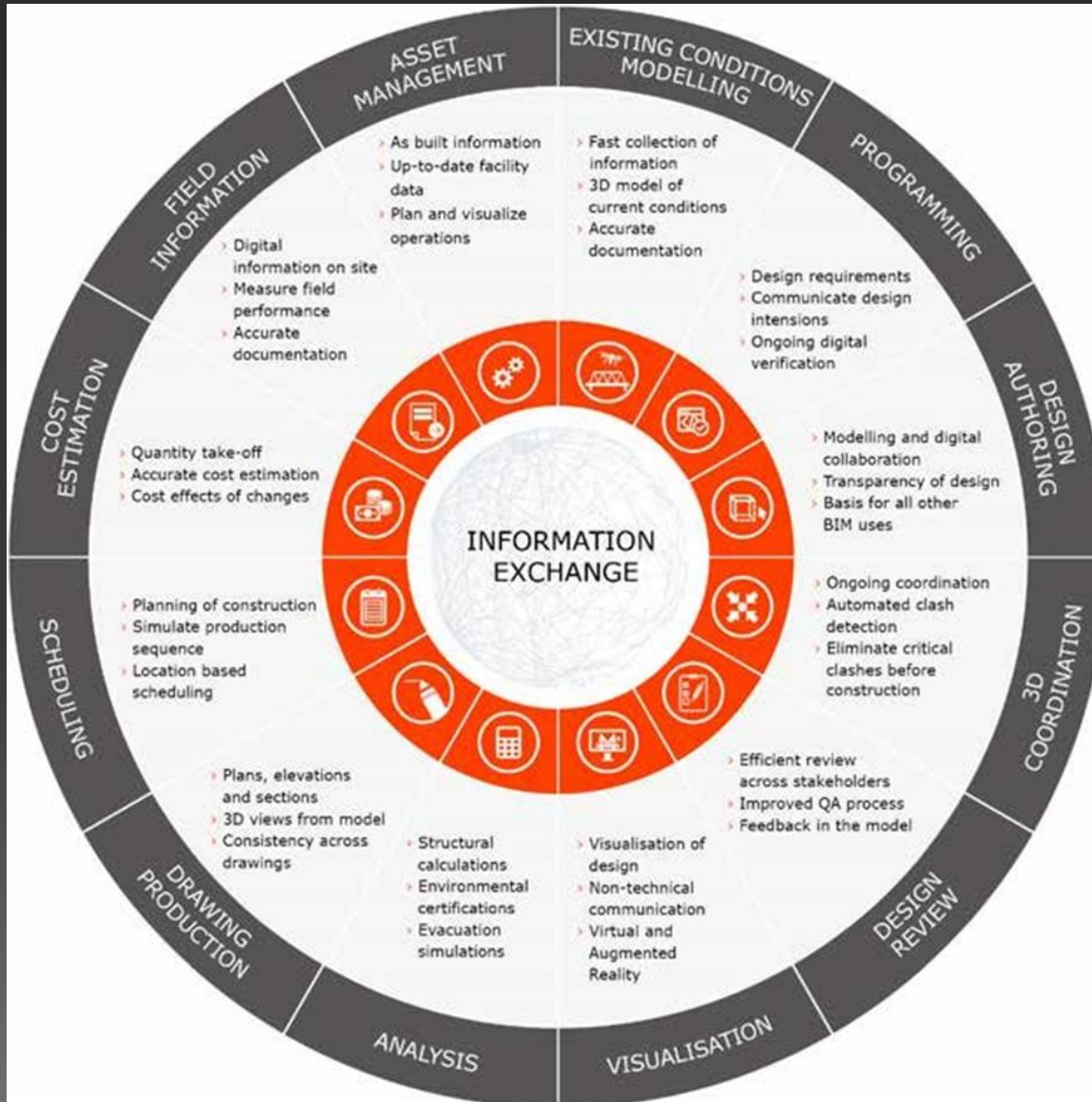
The semantics to be attached to the object, including properties, material, etc..

(c) Level of documentation

The kind of documentation to be associated to the object.

BIM and ISO 19650

from a project management perspective, BIM Execution Plan



BIM uses as identified by consulting engineers (by courtesy of COWI)

BIM and ISO 19650

from a project management perspective, Contracts

- Intellectual ownership
- Software tools
- Liability

CHALLENGES

- Increased cost of designs
- High cost of software
- Ignorance of the public sector of the benefits of BIM
- Lack of experienced BIM designers
- Lack of BIM managers in the Greek Market
- Greek Universities have little if any integration of BIM in their Curriculum
- Many engineering firms are not BIM ready
- Cloud data and security issues
- Contractual issues



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OPPORTUNITIES

- Still time
- Don't need to “reinvent the wheel”
- Work together with agencies, ministries, municipalities etc. to create a working framework. Things to be done right. Will for Participation in National Committee
- Work together with Contractors
- Be pioneers
- Education and Certifications- Zigurat Global Institute of Technology MoU
- Opportunity for Extraversion
- Need for a specialized NSRF for consulting firms in terms of software, training of existing and new jobs for skilled engineers and operators



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CONCLUSIONS

- Were here to offer our services-uses us and our expertise
- We are experts in the design with many companies working in BIM projects abroad and in Greece
- Things need to happen soon enough with the public sector playing a key role
- Consulting companies, Contractors and Public sector are together in this
- Lots of new job opportunities for engineers and consulting firms
- Education, training and certification
- Resources and assistance



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