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ERASMUS +

Erasmus+ Project ID: 2023-1-ES01-KA220-HED-000156652

BIM digital competencies to evaluate and improve the energy efficiency of European buildings.
A digital way towards positive energy districts

11:30 – 12:00 Introduction to BIM & Open BIM.

Speaker: UPCT

This Erasmus+ Project has been funded with support from the European Commission. This publication reflects the views only of the authors, and the European Commission and Erasmus+ National Agencies cannot be held responsible for any use which may be made of the information contained therein

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Summary :

- What is BIM?
- BIM in the Lifecycle of a BUILDING
- BIM Objectives: Dimensions
- Uses of BIM
- Benefits of BIM
- BIM Software
- Common Data Environment (CDE) - BIM Software

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What is BIM?

Building Information Modelling (BIM) is at the centre of a digital transformation of the construction sector and the built environment.

BIM is the acronym used to define "**Building Information Modelling**". But what does BIM mean? There are several definitions in the bibliography that can help us understand the concept of this digital tool that is used to manage project data and information of buildings. Among them, the definition of Eastman et al. (2011), in the Encyclopedia of Sustainable Technologies (2017), that defines BIM as:

"a **collaborative way for multidisciplinary information (including 3D Models) storing, sharing, exchanging**, **and managing** throughout the entire building project **lifecycle** including planning, design, construction, operation, maintenance, and demolition phase".

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What is BIM?

Some common connotations of multiple BIM terms are resumed by Succar (2009) in figure 1.

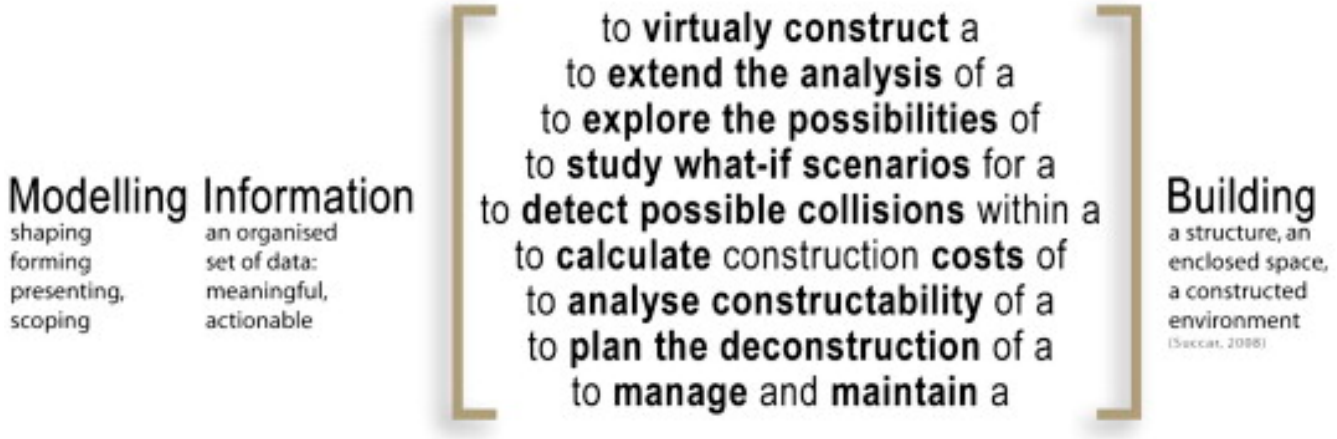

Figure 1: Common connotations of multiple BIM terms (Succar, 2009)

The best way to understand the BIM concept is by participating in it!

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What is BIM?

The presentation video of the BIMVET3 project (https://youtu.be/Fx1z2fLenzM) summarizes this concept, and briefly answers the initial question "what is BIM"?

BIM in the Lifecycle of a BUILDING

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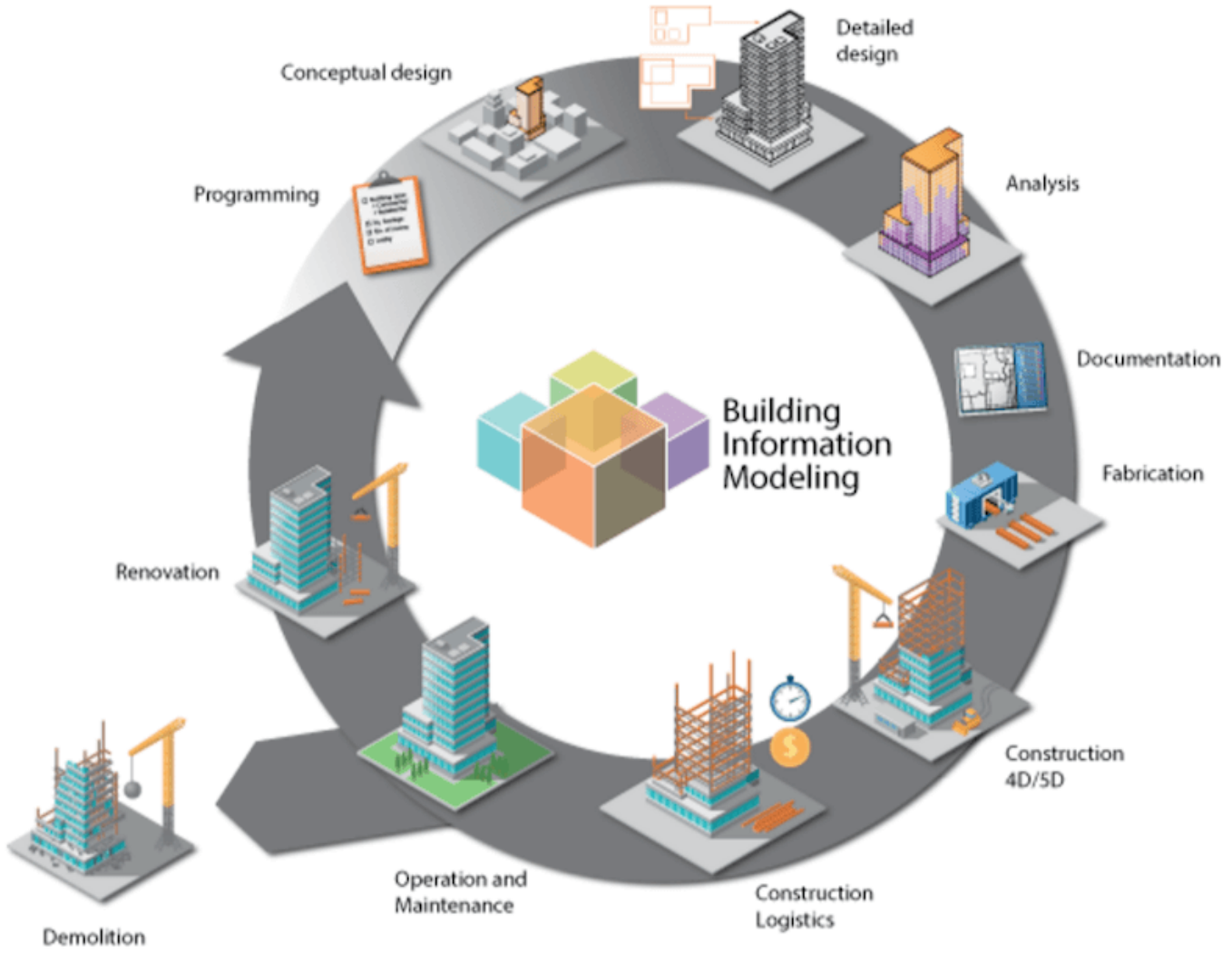

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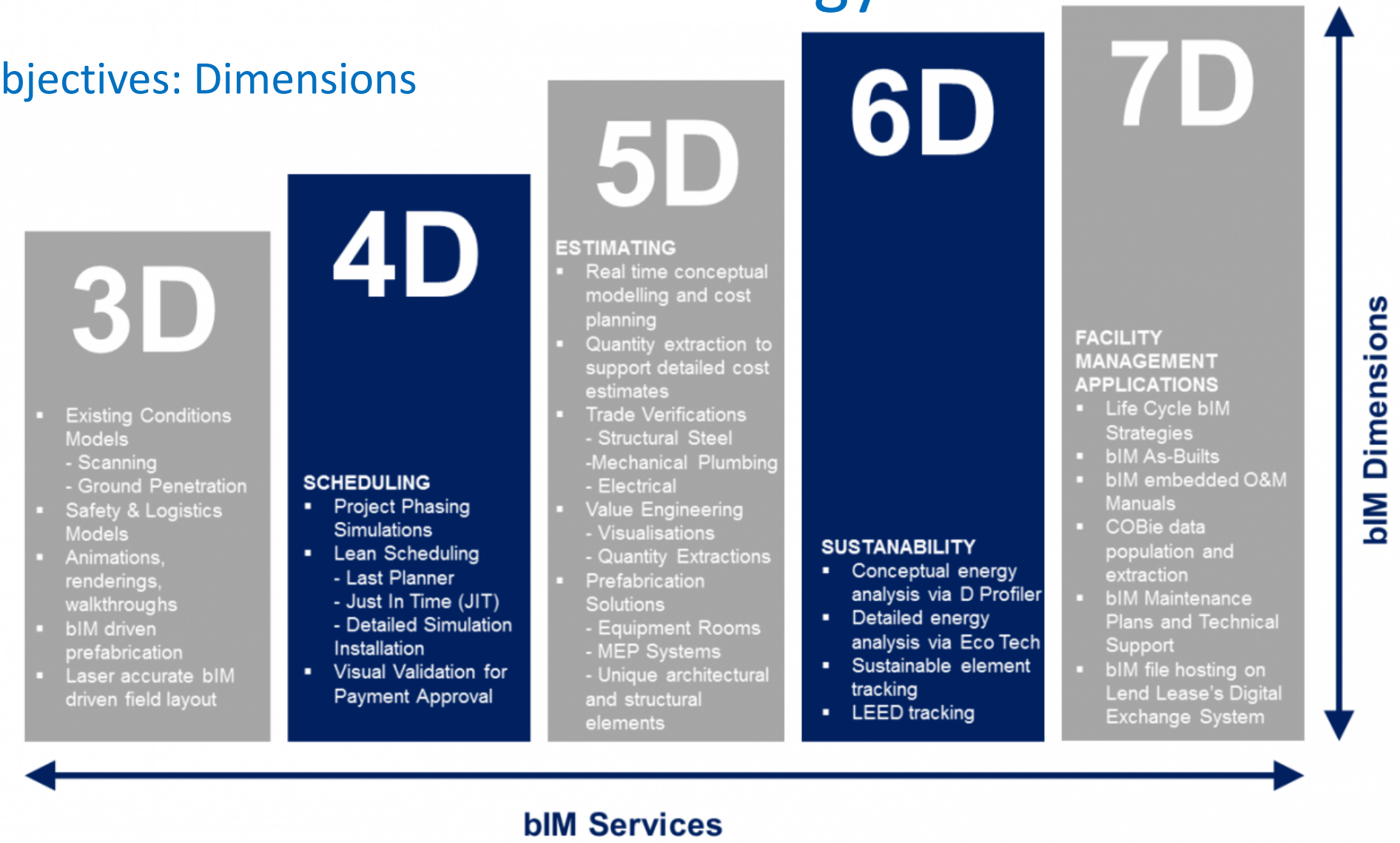
BIM Objectives: Dimensions



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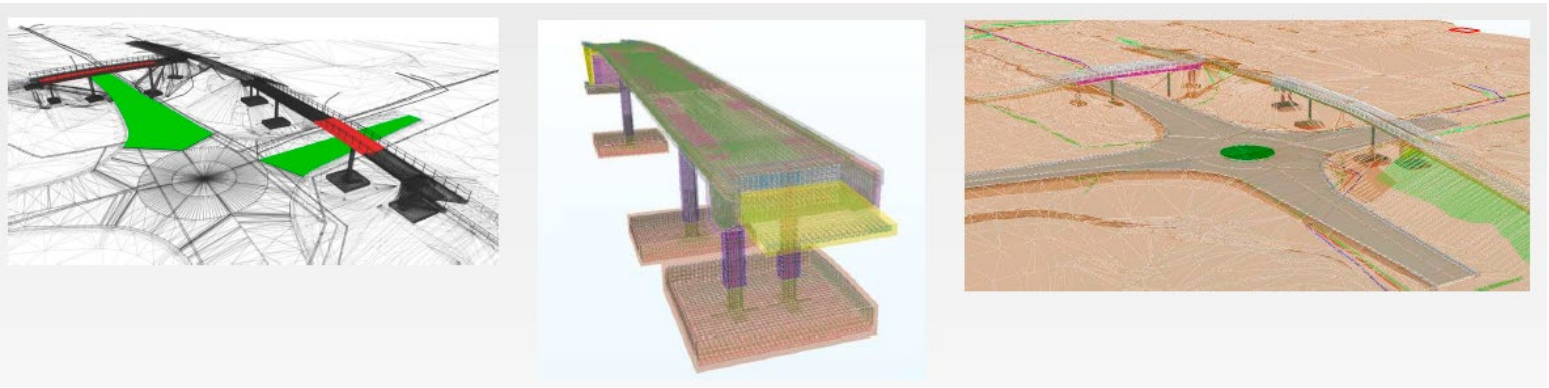
3D BIM



3D BIM is a digital geometric model that constitutes an X, Y and Z axis associated with further information. 3D modelling tools have been a huge success because:

- 2D views of geometric information can be generated from the 3D model at different levels of detail.
- Schedules can be generated, reporting on objects of different types within the 3D model.
- Multiple 3D models can be combined to report on any geometric clashes.

All of these features greatly improve accuracy and efficiency, and reduce the risk of errors occurring on projects.

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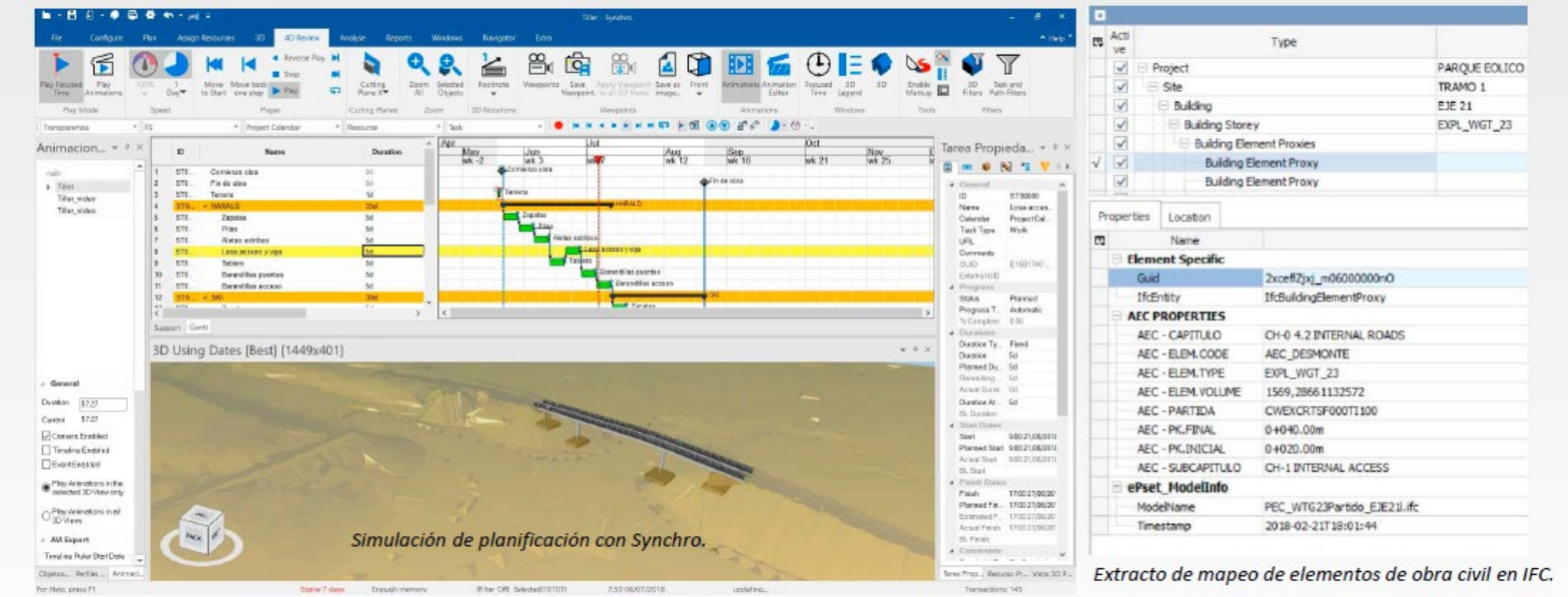
4D BIM – Time Simulations



Extracto de mapeo de elementos de obra civil en IFC.

4D BIM is adding scheduling information to model construction sequences. Adding a dimension of time allows the project team to better visualize how the construction will be sequenced. From a contractor point of view, this is vital. 4D BIM was a huge step forward for the industry when first made possible through the use of new modelling tools – it demonstrated collaboration between the design and construction team through coordination and sharing of 3D models.

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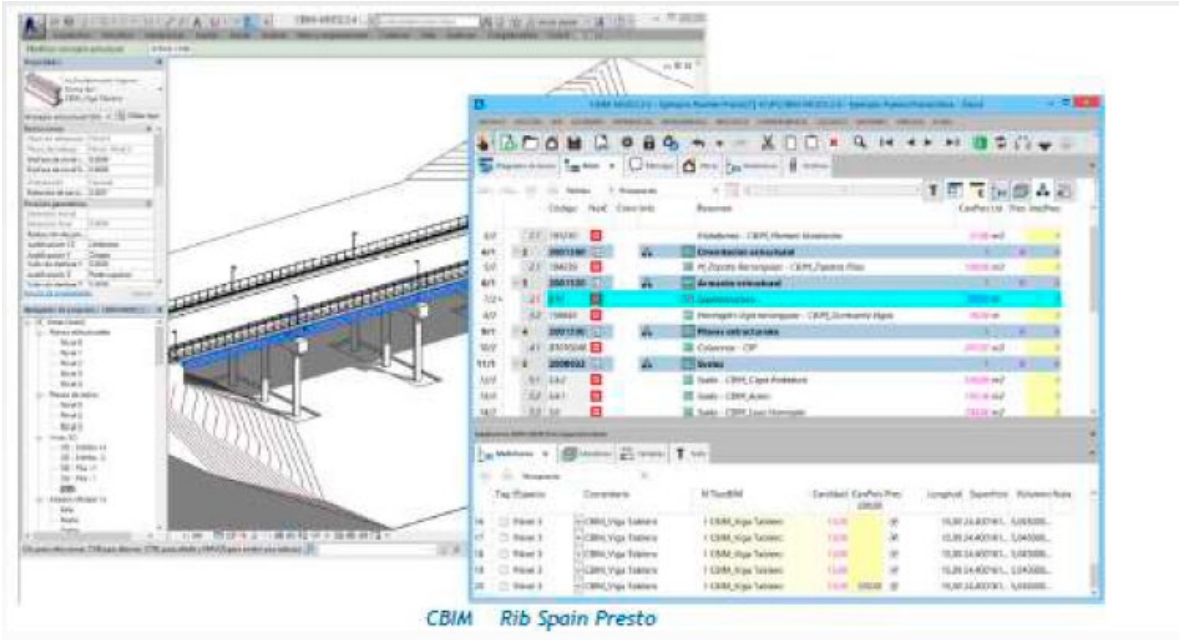
5D BIM - Cost



5D BIM is generally considered to be adding cost information to a model. If discussing 5D BIM, it is advised to clearly set out these specific requirements. For example, is the team expected to be providing capital or operational costs? Are these costs expected to be pre-tender estimates or a record of as-built costs? Who is responsible for adding this information? What method of measurement is to be used?

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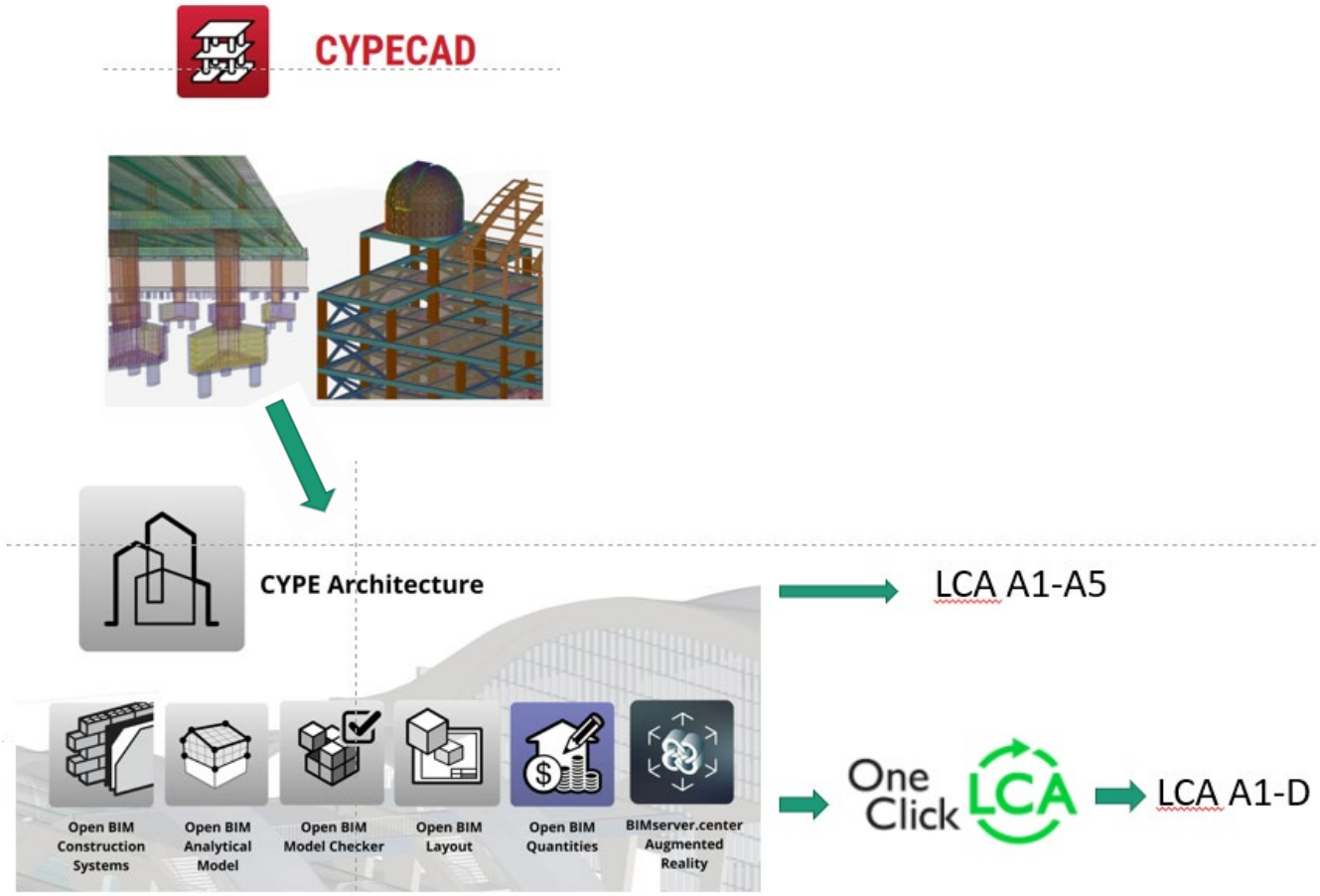
6D BIM – Sustainability: Life cycle analysis (LCA)



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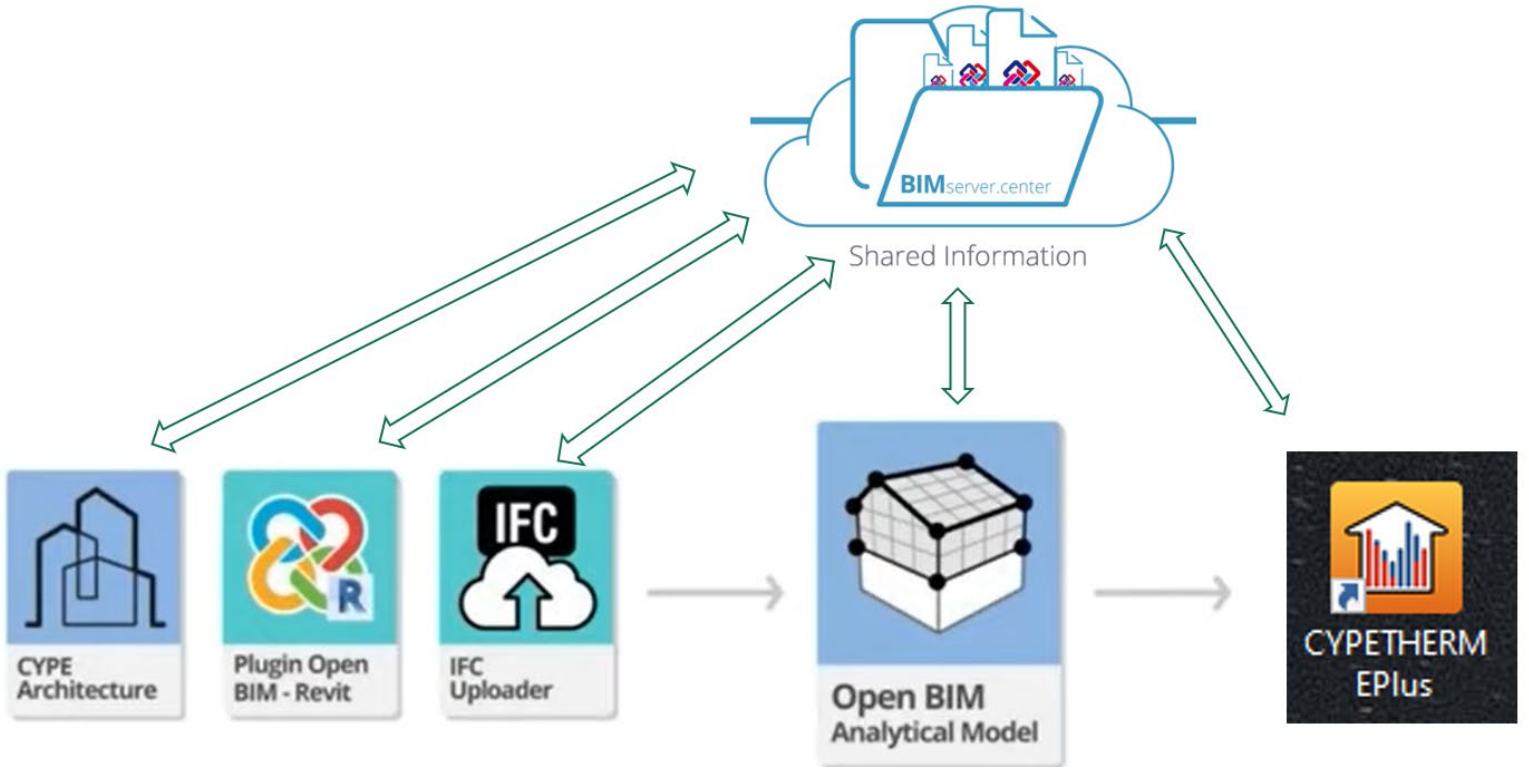
6D BIM – Sustainability: Building Energy Efficiency Analysis.

BIM 6D. Energy analysis workflow



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Uses of BIM

Benefits of BIM

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Mapping of the BIM Software

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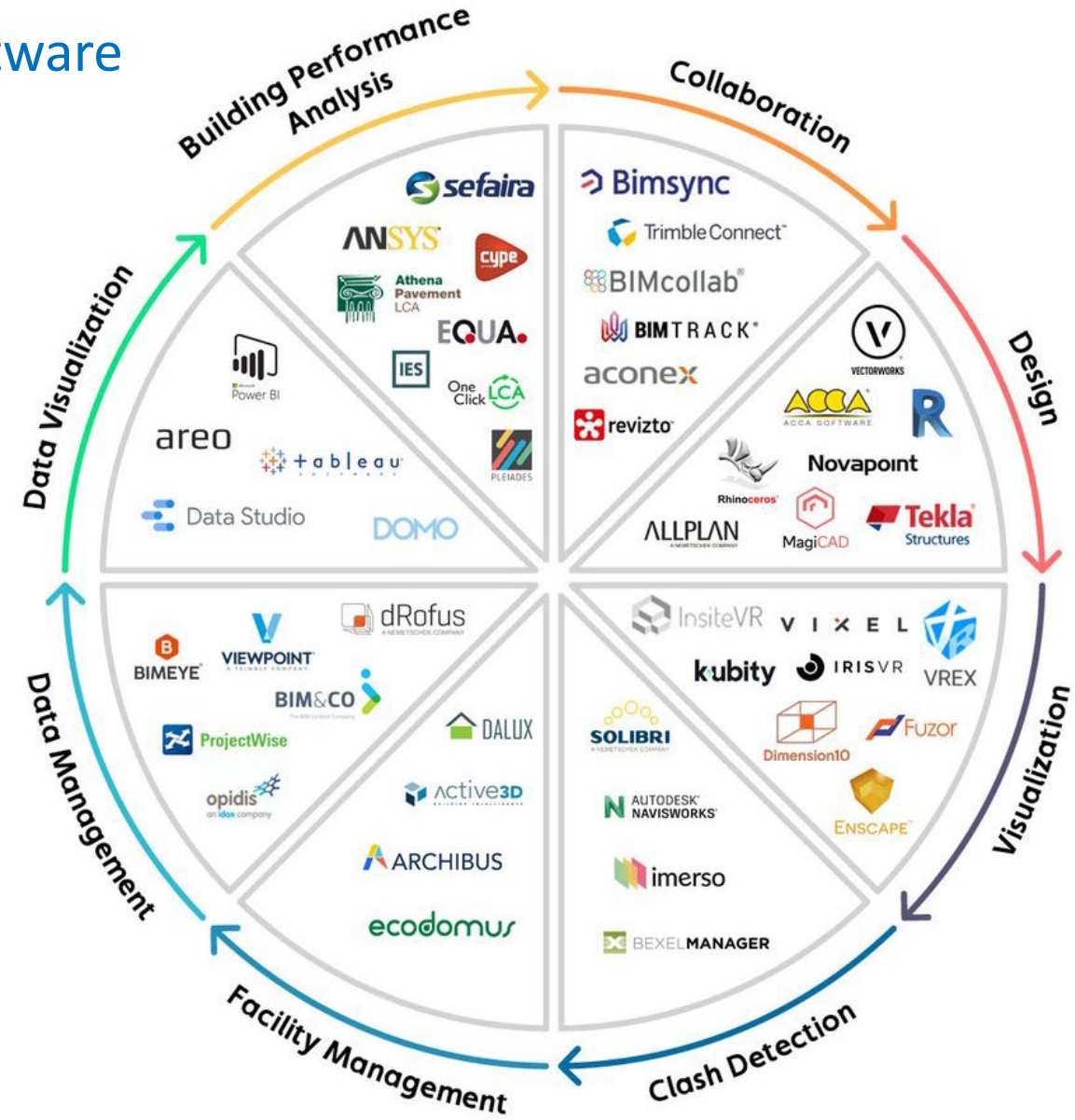

BIM Software for modelling BIM 3D geometry

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Revit

One of the most used BIM modeling software in the industry. Made for architectural design, MEP, structural design, detailing, engineering, and construction. Available alone or as part of the AEC Collection. Compatible with Microsoft Windows only.

Check

Tekla Structures

Tekla is a building information modeling software able to model structures that incorporate different kinds of building materials, including steel, concrete, timber and glass.Tekla allows structural drafters and engineers to design a building structure and its components using 3D modeling, generate 2D drawings and access building information.

Check

ArchiCAD

ArchiCAD is a complete design suite with 2D and 3D drafting, visualization and other building information modeling functions for architects, designers and planners. A wide range of software applications are integrated in ARCHICAD to cover most of the design needs of an architectural office.

Check

Civil 3D

Civil 3D is creative software used by Civil engineers and Architect professionals to plan, design, and manage civil engineering projects. It is a solution that creates civil engineering design and documentation that supports CAD and BIM workflows.

Check

Allplan

It is an all-in-one building information modeling software that gives architects and engineers full control over their designs and the ability to create building designs and structural models with creativity, freedom and flexibility

Check

Rhinoceros

Rhino is a universal building information modeling software solution the gives architects and engineers full control over their projects and the ability to produce building designs and construction models with creativity, freedom, and flexibility.

Check

Novapoint

Novapoint is a platform for designing and documenting infrastructure and terrain projects. Its allowing civil engineers to effectively design all aspects of modern roads, railways, tunnels, bridges, water and sewer.

Check

Mapping of the BIM Software

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BIM Software for disciplinary/multidisciplinary coordination

Navisworks Manage

Navisworks is a comprehensive project review solution that supports 4D and 5D simulation, coordination, analysis, and communication of design intent and constructability.

Check

Solibri

Is a BIM Quality Assurance and Quality Control software. Providing out-of-the-box tools for BIM validation, compliance control, design process coordination, design review, analysis and code checking.

Check

Trimble Quadri

Trimble Quadri is a common, centrally shared model solution for GIS & BIM data. It is a model server for infrastructure projects, supporting all phases and disciplines involved. Providing an object-, network-, and process-oriented model platform.

Check

Bexel Manager

BIM management software where all analysis are integrated into a single model and single solution. Bexel has funcionalies for implementing 3D 4D 5D 6D level of BIM in your project.

Check

Common Data Environment - CDE

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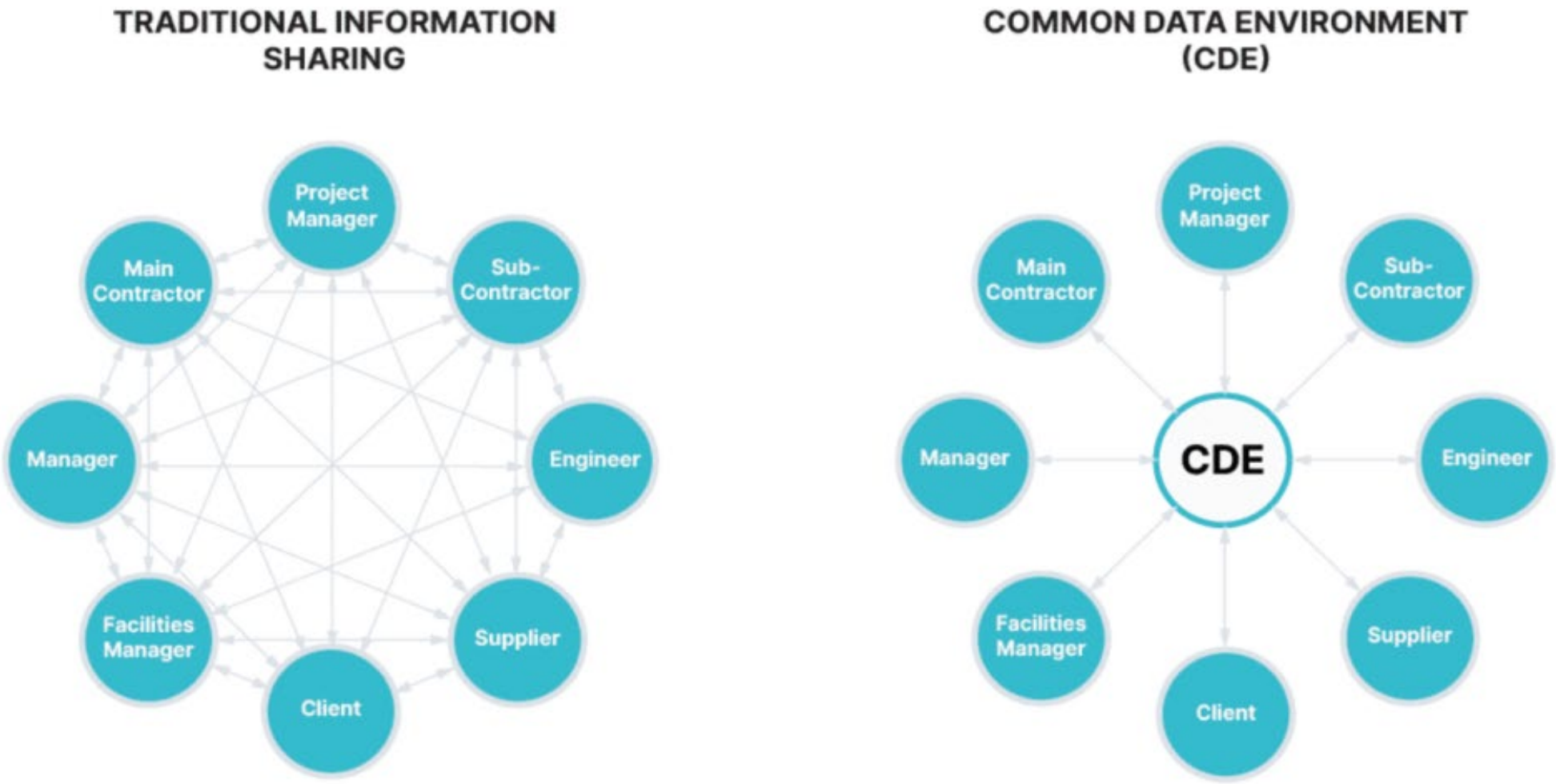
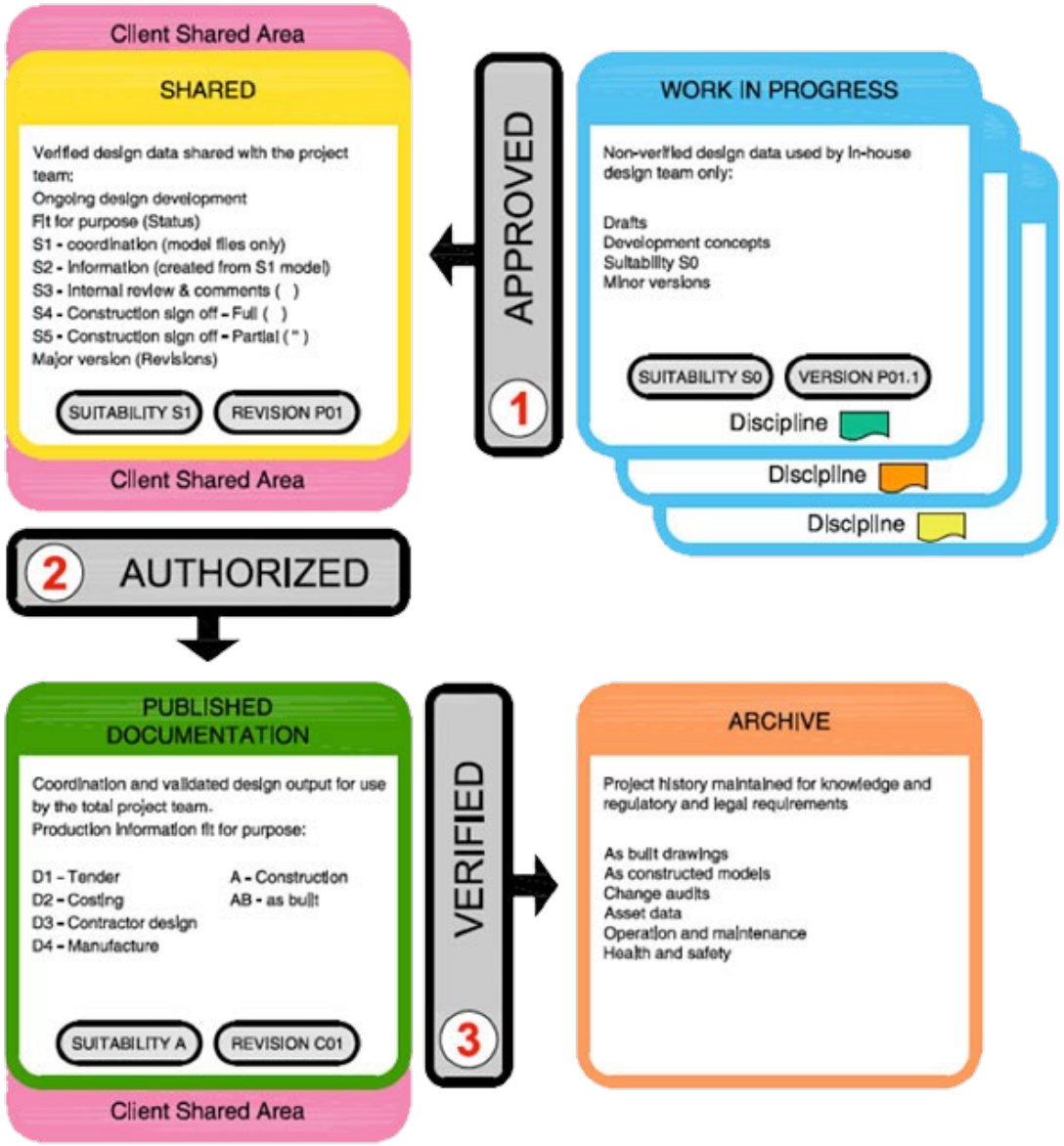


Common Data Environment – CDE – Shared folders and files



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Mapping of the BIM Software

Choosing right Common Data Enviroment

BIM 360

BIM 360 is an advanced cloud-based Common Data Environment from Autodesk. A unified platform connecting your project teams and data in real-time, from design through construction, supporting informed decision-making and leading to more predictable and profitable outcomes

Check

Viewpont for Projects

A cloud based document and information management solution for sharing, controlling and collaborating on project information with dispersed project teams. Viewpoint for Projects CDE will allow users customers to deliver level 2 BIM projects.

Check

Microsoft SharePoint

SharePoint is a web-based collaborative platform that integrates with Microsoft Office. Commonly used in bigger enterpises.

Check

Trimble Connect

Trimble Connect is an open collaboration tool make project information traceable, transparent, and accessible to help users to build better. Allows users to view, share, and access project information from anywhere, at anytime.

Check

Bentley ProjectWise

Project collaboration software. It helps project teams to manage, share and distribute engineering project content and review in a single platform. While ProjectWise can manage any type of CAD, BIM, geospatial and project data, it integrates with Bentley applications, and other products including Autodesk software and Microsoft Office.

Check

Allplan Bimplus

Is an open BIM platform for all disciplines to collaborate efficiently in building projects. BIM model data, information, documents and tasks are managed centrally over the complete building life cycle.

Check

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That’s all

Thanks for your attention