Building Information Modeling

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CM 2
Building Project Management

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INTRODUCTION

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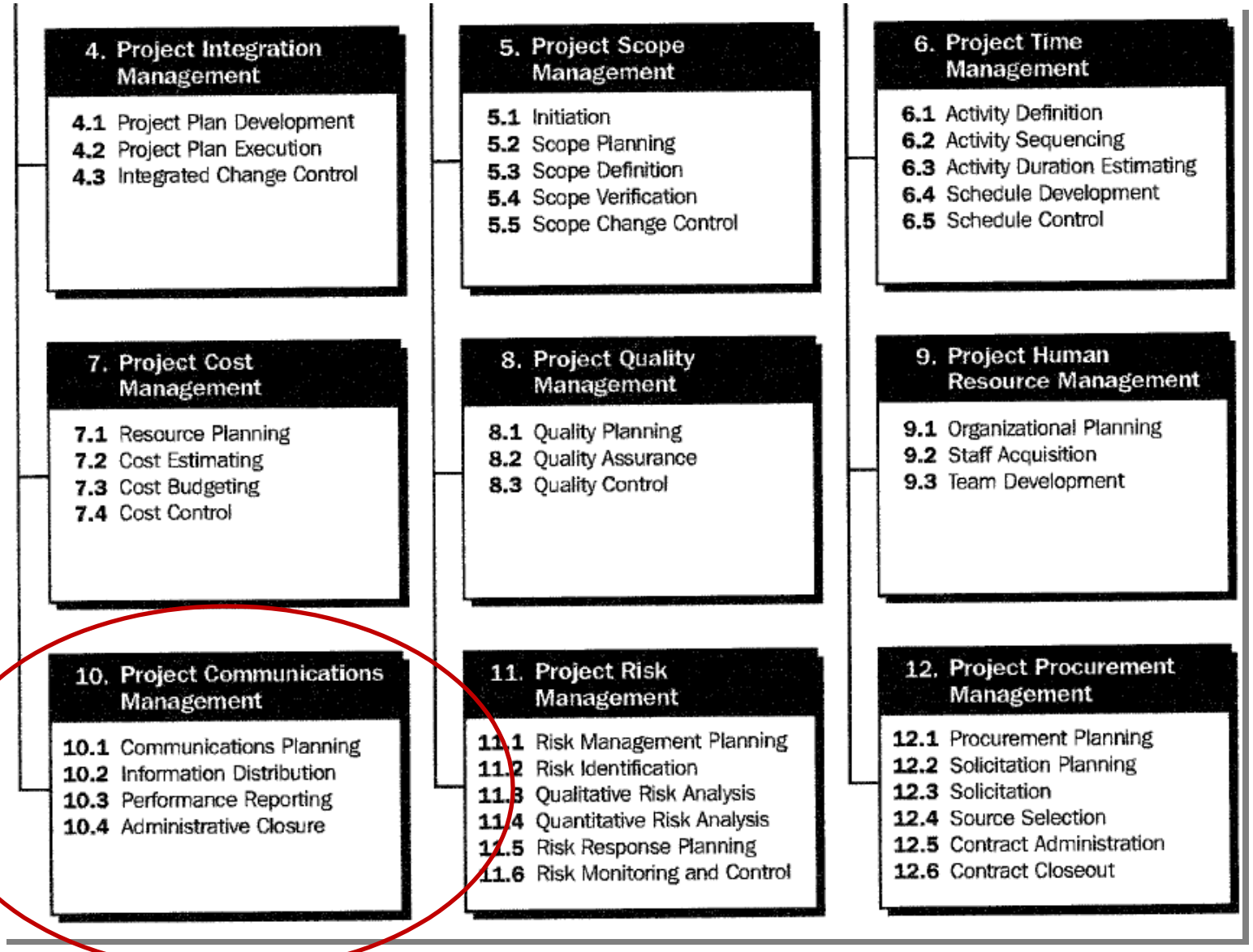
COMMUNICATION MANAGEMENT



BUILDING INFORMATION MODELING

Building Information Modelling is a **process** of storing and managing **information** (physical and functional characteristics of a building or a structure) with the help of a **3D virtual model** during the **planning**, the implemenetation of a **construction** projekt and during the operation, and the **maintenance** of a buiding.

certain building PM tasks on digital platform

SIMILAR DEFINITATIONS

BIM

Building Information Modeling

BAM

Building Assembly Modeling

BOOM

Building Operation (and) Optimalization Modeling

BIM HISTORY

1970 the first idea – concept of BIM

mid. 80-ies - the term: building model (as we use today)

1992 the term BIM

2002 the first applications (Graphisoft, Bentley, Autodesk, etc.)

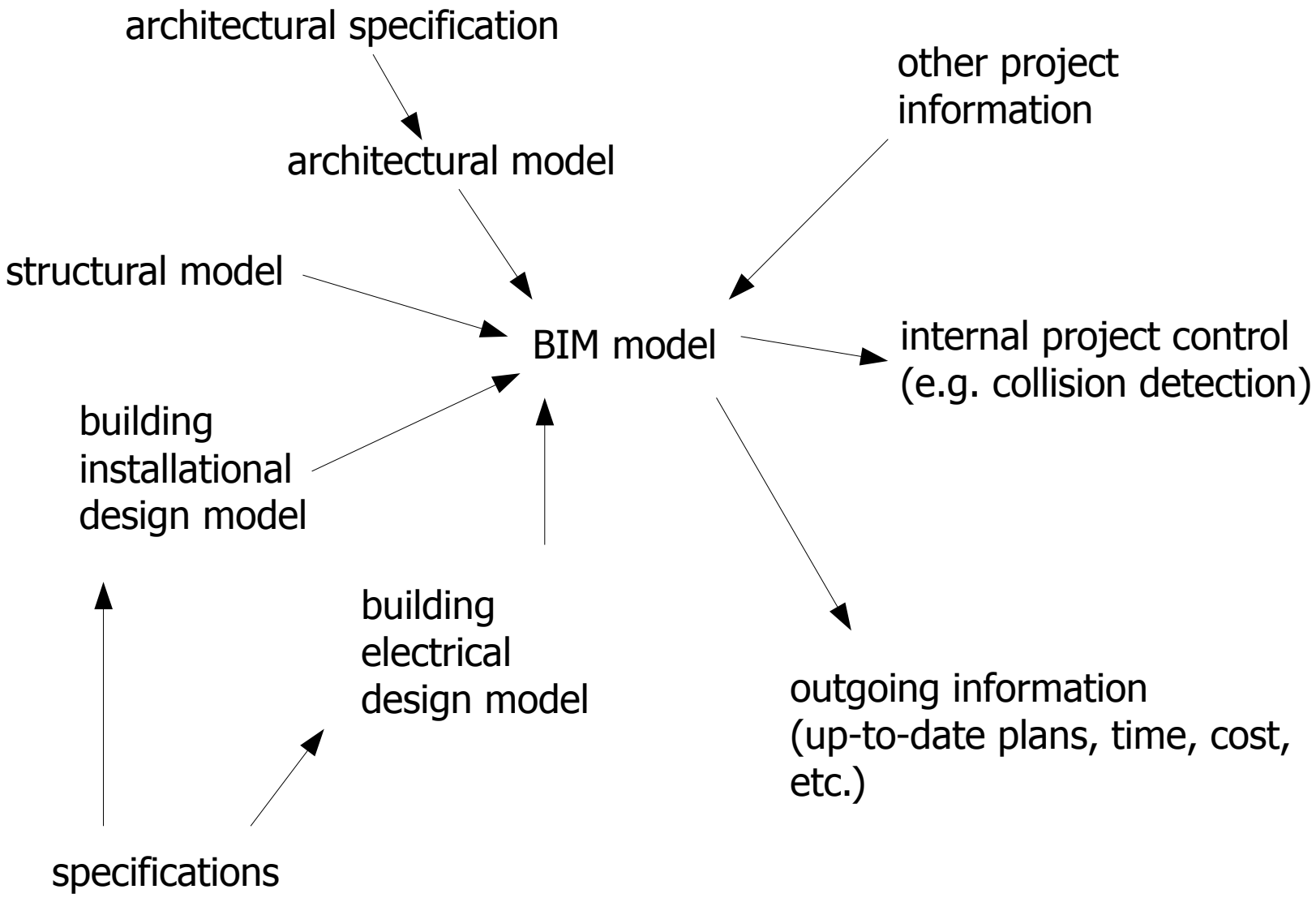
BIM AND PUBLIC PROCUREMENT IN EUROPE

- UK – since 2016 all public procurement architectural project have to BIM based
- Finnland
  - since 2001 pilot projects
  - since 2007 IFC-standard virtual model for state investments
- Norway
  - application of BIM is obligatory for all public projects – exception with special allowence only
- Denmark
  - application of BIM is obligatory for all public projects – above 2.7m€ in case of local and regional investments and 670.000€ in case of governmental investments
- Netherlands
  - since 2011 application of BIM is obligatory for all public projects – above 10m€

BIM AND PUBLIC PROCUREMENT BEYOUND EUROPE

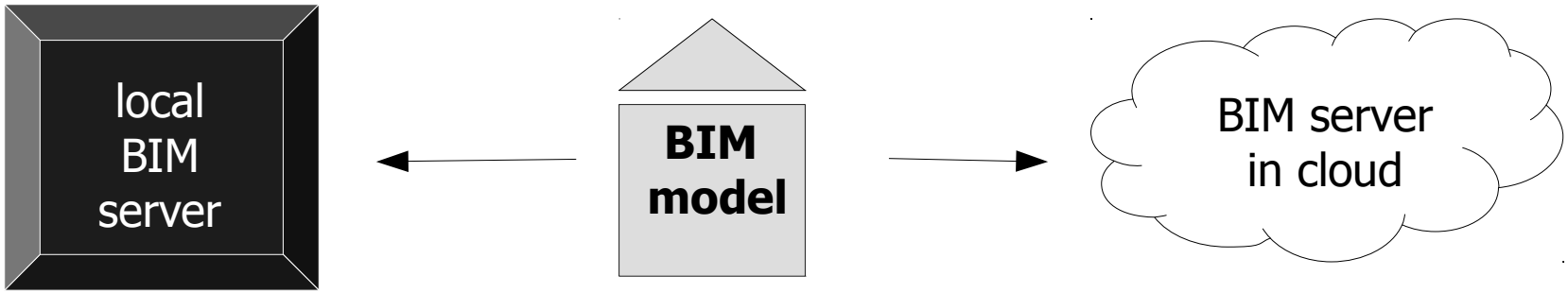
- USA
  - at General Service Administration (GSA), Wisconsin, Texas states – the application of BIM is obligatory
- Singapur
  - since 2013 for large projects, and since 2015 for small projects the application of BIM is obligatory
  - the allowence process of the authority is shorter in case of using virtual building model
- China
  - ministerial order – up to 2020 90% of the public investments (large and intermediate projects) will be BIM-based

BIM AS A SYSTEM



BIM AS A SYSTEM

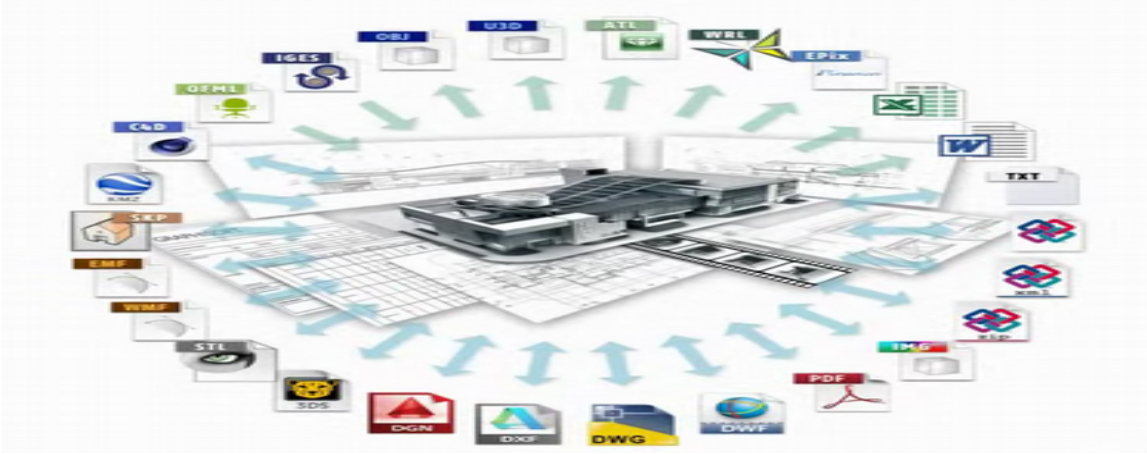
DATA STORING



NEW WAY OF THINKING

No paper-based documentation stored...

No altering project versions...



No contradictory information...

BIM model normally in cloud

ADVANTAGES OF BIM SYSTEM

- eventual collisions are detected and eliminated
- no altering data sources – one official database for all stakeholders
- no altering versions of documentation – direct access to up-to date data in cloud
- database with an access to only the necessary information
- database with personalised access for each stakeholder

OPEN BIM

Open BIM:

A cooperation in the planning, implementation and maintenance phase of a building, which based on an open standard.

Closed BIM:

Working in a system based on the standards of a sole software vendor/developer.

OPEN BIM

...means also :

- platform/system independence
- open collaboration
- workflow compatibility
- software vendor groups agreed

buildingSMART International home of openBIM

OPEN BIM™

IFC

Industrial Foundation Classes

Supported by 150 softwares worldwide

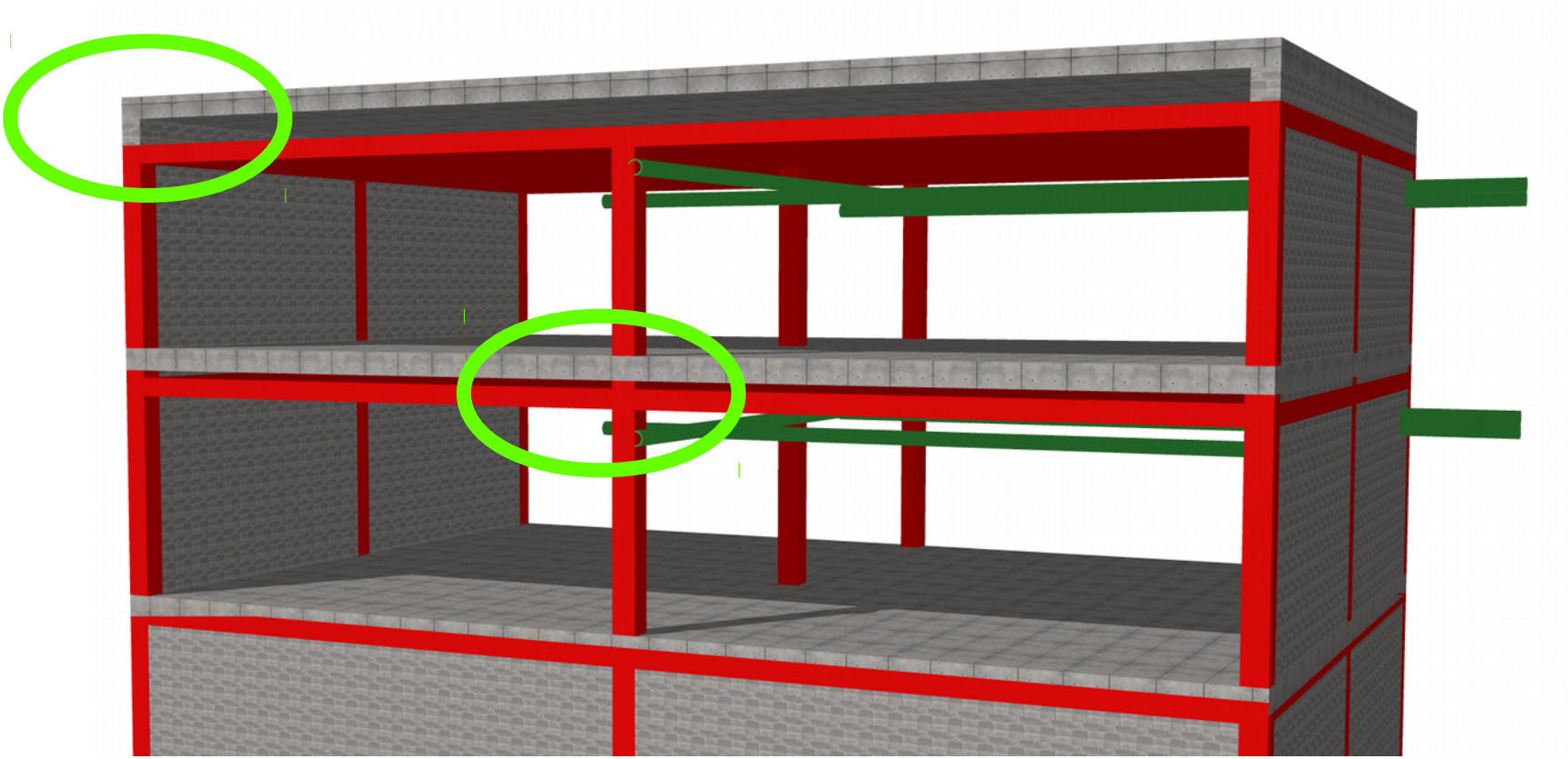
Open standard in architectural and civil engineering that enables data transfer between the different digital platforms and programs.

TASKS OF THE STAKEHOLDERS

- the regular upload of the newest version of the models
- regular collision control to avoid problems
- upload detailed information on construction elements
- download information to work with

COLLISION CONTROL/DETECTION

2 or more models compared...



e.g. architecture
+structural design

+ building installation

4D – 5D BIM

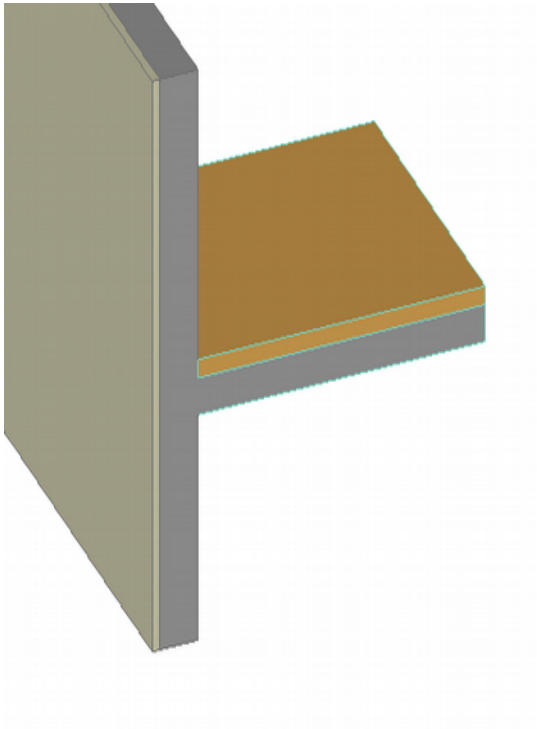
3D=virtual model

4D=BIM related time management

5D=BIM related cost management

4D Time management in BIM

High accuracy 3D architectural model



list of structural items

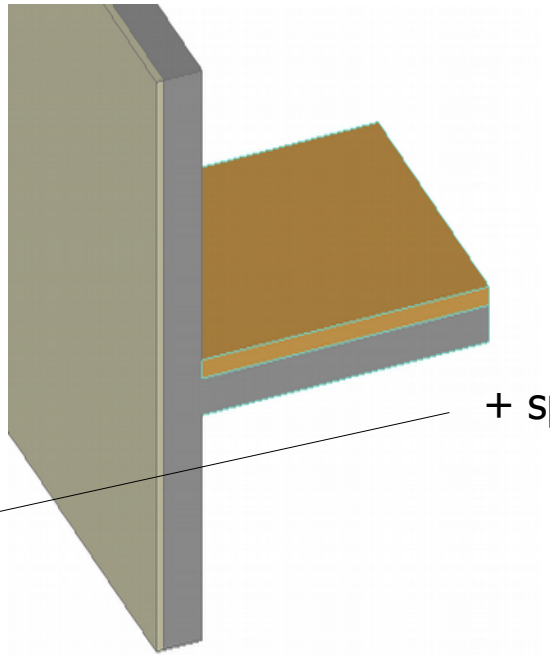
list of activities

+ time norms

Gantt diagram / MPM

5D Cost management in BIM

High accuracy 3D architectural model



+ specification

list of structural items

+ time norms

list of activities

+ cost norms

list of materials

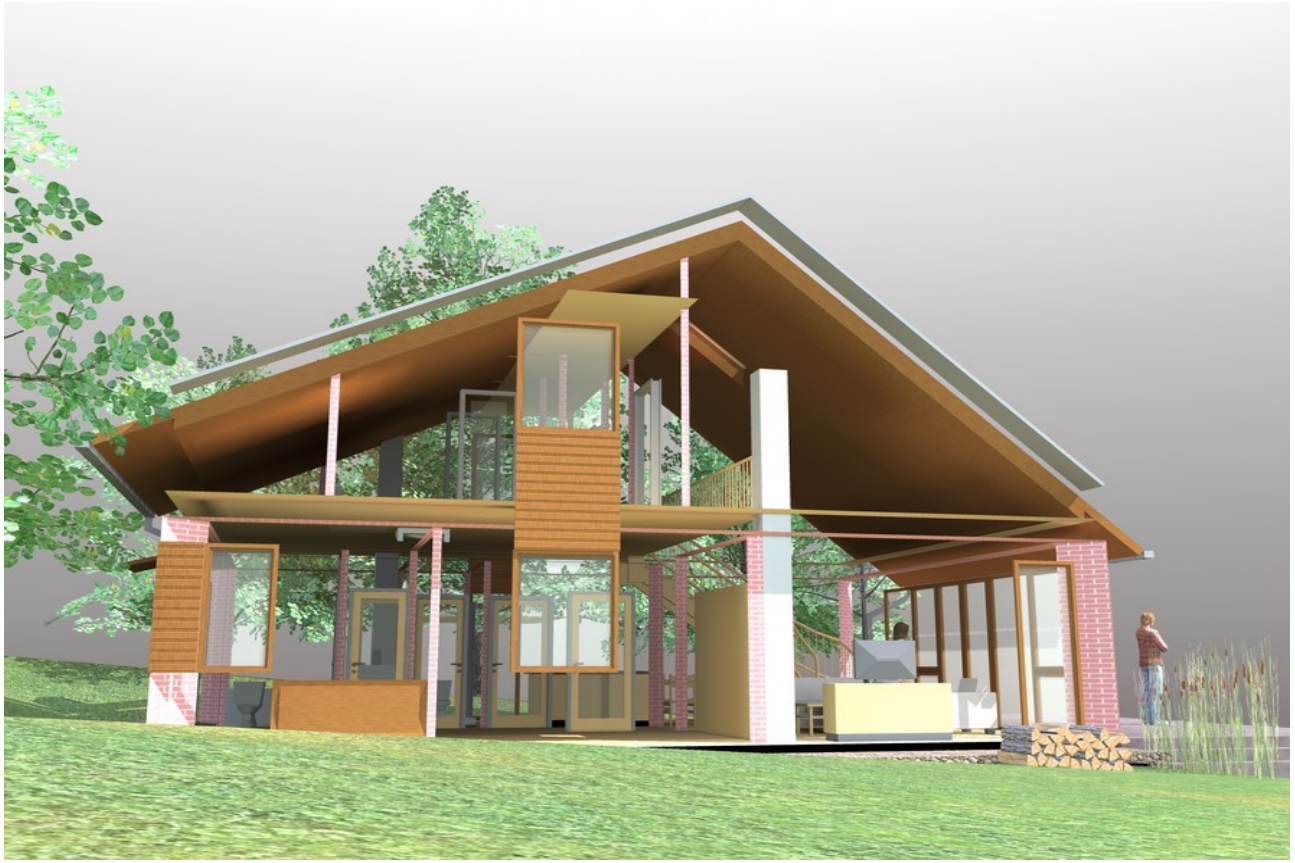
time of activities

+ hourly payment

cost of work + cost of materials → cost estimation/ calculation

BIM LIBRARIES

Online databases with predefined BIM objects (geometry + specification)



by

standards

material providers
NGO-s etc.

BIM MANAGER

In case of BIM-based projects a person in charge for the information (data) management and the perfect running of all the processes and BIM functions.

BIM for client

BIM model

smart gadget application

CONTRACTING WITH BIM SYSTEM

- no paper-based documentation
- no paper based submission
- overlapping project phases

different requirements have to be formulated in contracts

continuous fulfilment during project duration

PROJECT CONTROL IN BIM SYSTEM

- no paper-based documentation
- self-controlling processes supported by the system
- self-acting feedback
- more responsibility in common with other stakeholders

BIG BIM AND LITTLE BIM

BIG BIM

Using BIM method for building projects harnessing all opportunities which offered by the system – it involves more professions as well.

Little BIM

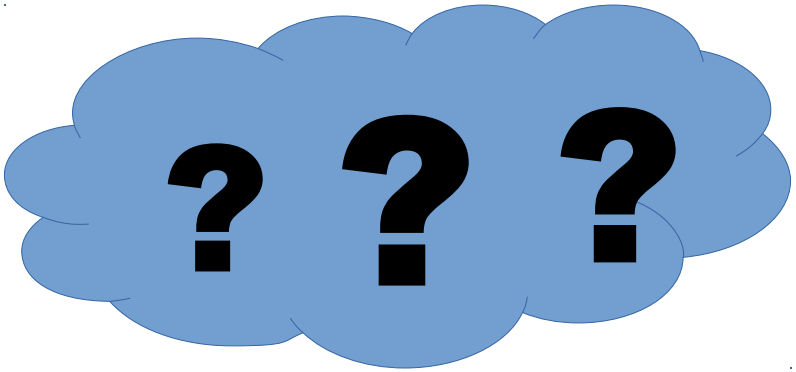
Isolated utilization of BIM functions – the potential of the system is not fully harnessed.

BIM IN MAINTENANCE AND FM

- regular updating of the model with the information at the time of the implementation
- ongoing application of the existing system – for maintenance and for FM
- using the same model in case of refurbishment

BIM ON THE LONG RUN - CHALLENGES

- software version support for 25 years time
- data storing quality



- development of data storing forms
- work with obsolete databases after some decades of break

RESEARCH AND INNOVATION ON BIM

- large scale buildings
- small scale buildings
- information flow
- database management
- etc.

future

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