

**SAMSUNG**

Climate Solutions

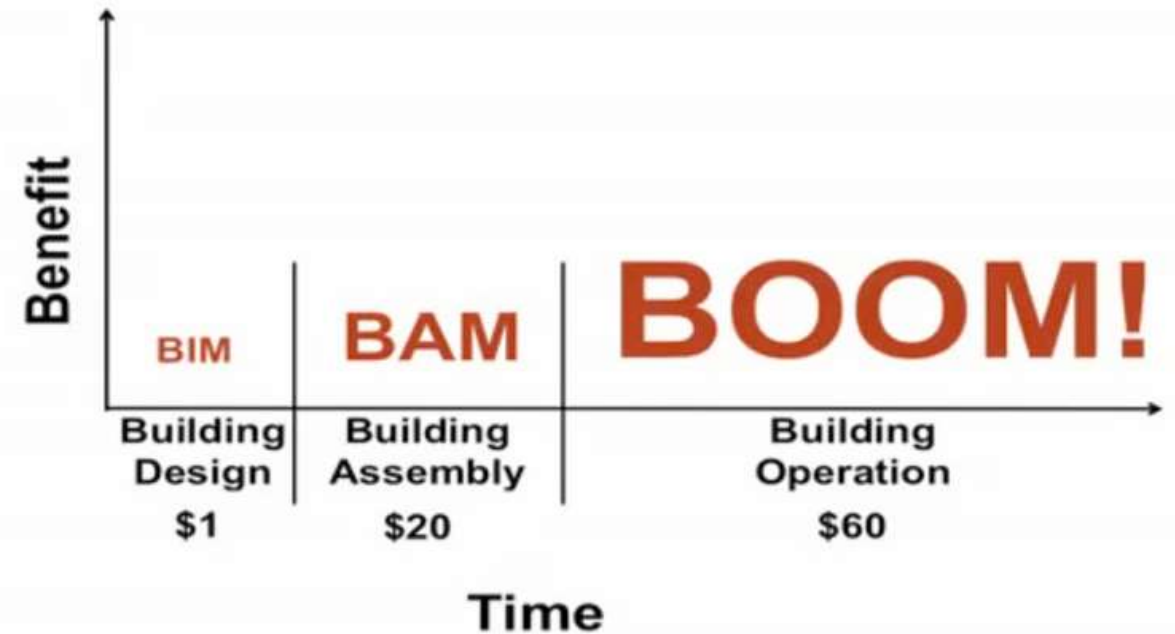
# Samsung BIM desing

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# AEC industry overview

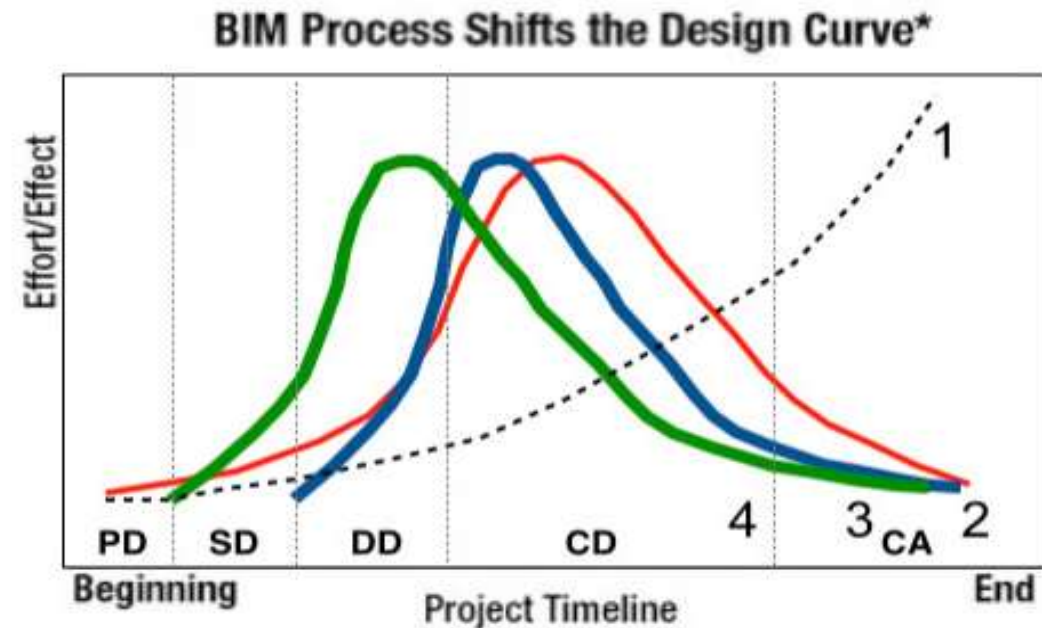
- Design costs accounts for 5% of total building erection costs and 1.5% of total cost of ownership through the building lifecycle
- Architecture, Engineering and Construction industry didn't have any major improvement except digitalisation and BIM process which is happening now



# Main BIM principle

- To shift the design process and time investment in early phases of project
- this effect results in better and more cost effective buildings
- Improvement of AEC industry

1. Cost impact of changes
2. Traditional process
3. BIM in document phase
4. BIM in design phase



**What is BIM?**



# Building information modeling (BIM)

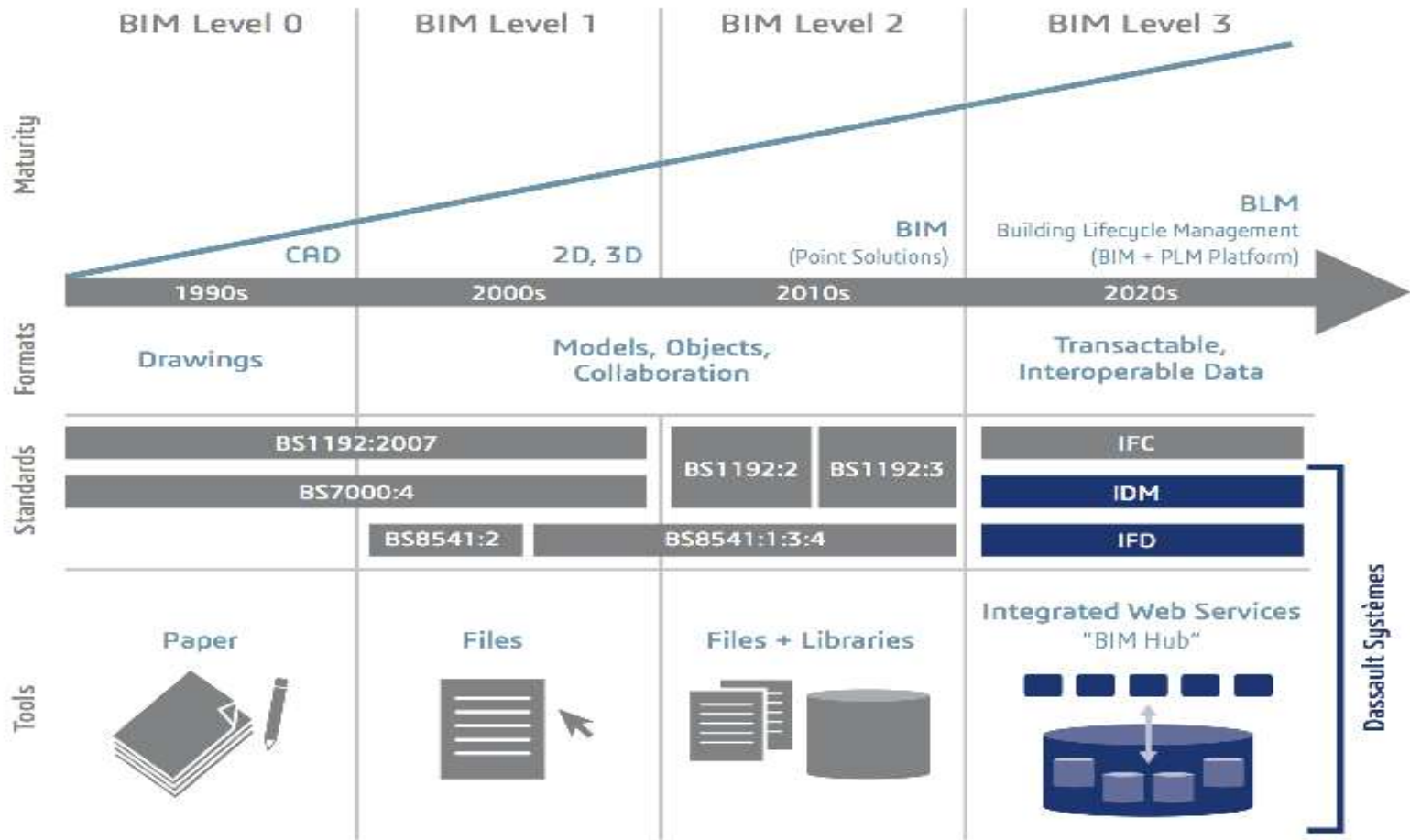
process supported by various **tools**, **technologies** and **contracts** involving the generation and management of digital representations of physical and functional characteristics of places.

BIM is simply an integrated approach to designing, building and maintaining buildings with **sharing information** as much as possible **in early stages of project**



# BIM levels

- Level 0
- Level 1
- Level 2
- Level 3



The BIM Maturity Model by Mark Bew and Mervyn Richards adapted to reflect BLM's relationship to Level 3.

# LOD matrix

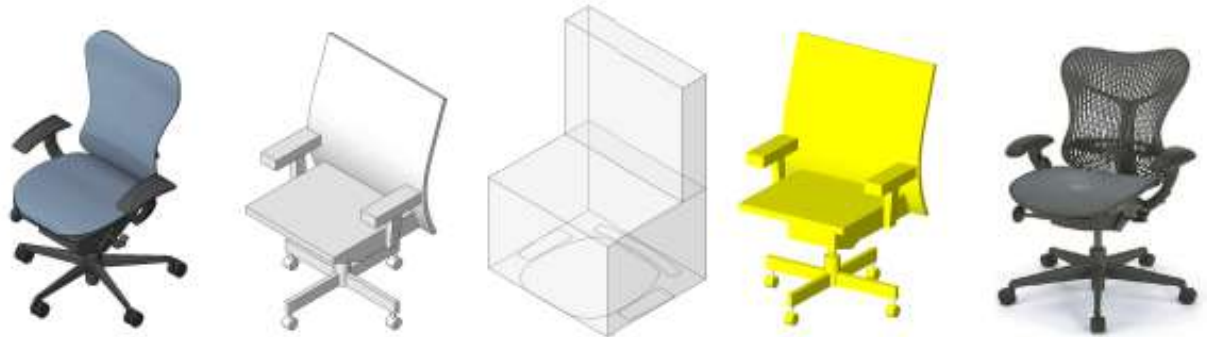
Defines level of development for given project and project disciplines:

- Mechanical
- Electrical
- Plumbing
- Structural
- Architectural

Level of development is different in each stage of the project and is defined by general BIM execution plan (BEP) in the beginning of the project phase

## LEVEL of DEVELOPMENT

LOD 100      LOD 200      LOD 300      LOD 400      LOD 500



Concept (Presentation)    Design Development    Documentation    Construction    Facilities Management

<u>DESCRIPTION:</u> <b>Office Chair</b> Arms, Wheels <u>WIDTH:</u>  <u>DEPTH:</u>  <u>HEIGHT:</u>  <u>MANUFACTURER:</u> Herman Miller, Inc. <u>MODEL:</u> Mirra <u>LOD:</u> <b>100</b>	<u>DESCRIPTION:</u> <b>Office Chair</b> Arms, Wheels <u>WIDTH:</u> <b>700</b> <u>DEPTH:</u> <b>450</b> <u>HEIGHT:</u> <b>1100</b> <u>MANUFACTURER:</u> Herman Miller, Inc. <u>MODEL:</u> Mirra <u>LOD:</u> <b>200</b>	<u>DESCRIPTION:</u> <b>Office Chair</b> <b>Arms, Wheels</b> <u>WIDTH:</u> <b>700</b> <u>DEPTH:</u> <b>450</b> <u>HEIGHT:</u> <b>1100</b> <u>MANUFACTURER:</u> Herman Miller, Inc. <u>MODEL:</u> Mirra <u>LOD:</u> <b>300</b>	<u>DESCRIPTION:</u> <b>Office Chair</b> <b>Arms, Wheels</b> <u>WIDTH:</u> <b>685</b> <u>DEPTH:</u> <b>430</b> <u>HEIGHT:</u> <b>1085</b> <u>MANUFACTURER:</u> <b>Herman Miller, Inc</b> <u>MODEL:</u> <b>Mirra</b> <u>LOD:</u> <b>400</b>	<u>DESCRIPTION:</u> <b>Office Chair</b> <b>Arms, Wheels</b> <u>WIDTH:</u> <b>685</b> <u>DEPTH:</u> <b>430</b> <u>HEIGHT:</u> <b>1085</b> <u>MANUFACTURER:</u> <b>Herman Miller, Inc</b> <u>MODEL:</u> <b>Mirra</b> <u>PURCHASE DATE:</u> <b>01/02/2013</b>
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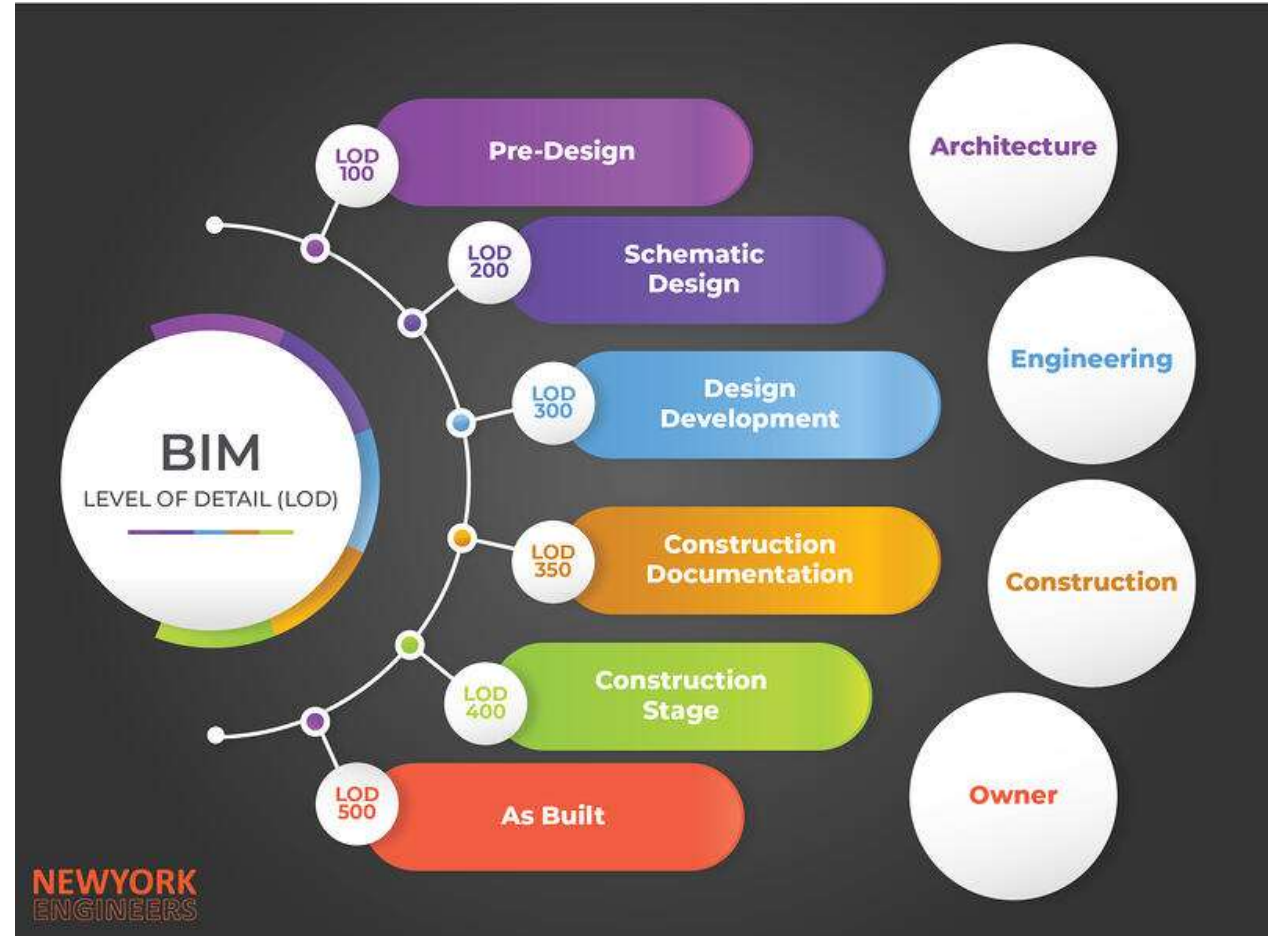
(Only data in red is useable)

practicalBIM.net © 2013

# BIM Execution plan (BEP)

BEP contents:

- **Define BIM deliverables in form of information exchanges, model progression, model quality (LOD)**
- Detail plan to support execution process via indentification of major deliverables
- Define process steps
- **Define roles and responsibilities for model creation, maintenance and collaboration across the project life cycle phases**





# Closed vs Open BIM

**Open:** Interoperable (exchange data no matter which software the data comes from)

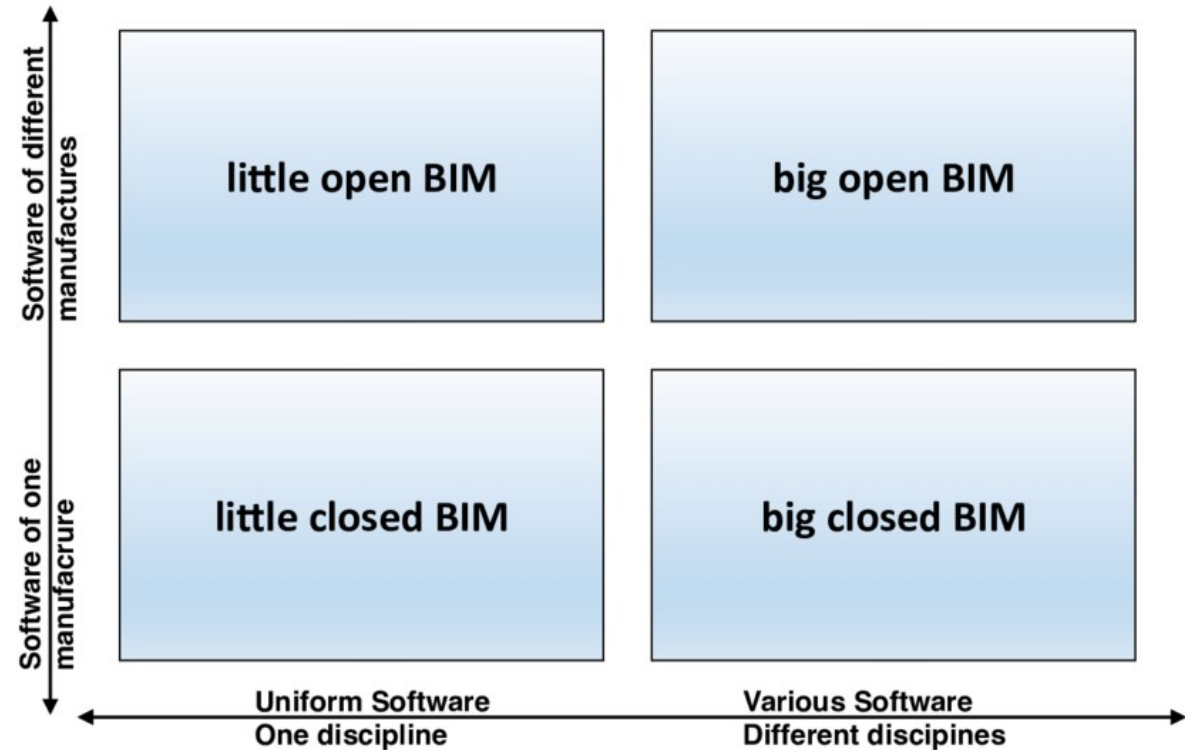
**Not Open:** proprietary, only one software vendor (expensive to maintain, but best for integrating most disciplines)

Questions to ask:

What kind of BIM files will be shared and can we generate those files?

What softwares will be used on the project?

What will be the CDE (common data environment)?



# 3D...7D?

3D = space

4D = time

5D = cost

6D = sustainability, LCM

7D = facility management

Multiple softwares  
required from 3D to 7D  
projects



**Why BIM?**



Over **60%** of major capital programs fail to meet cost and schedule **targets**<sup>1</sup>



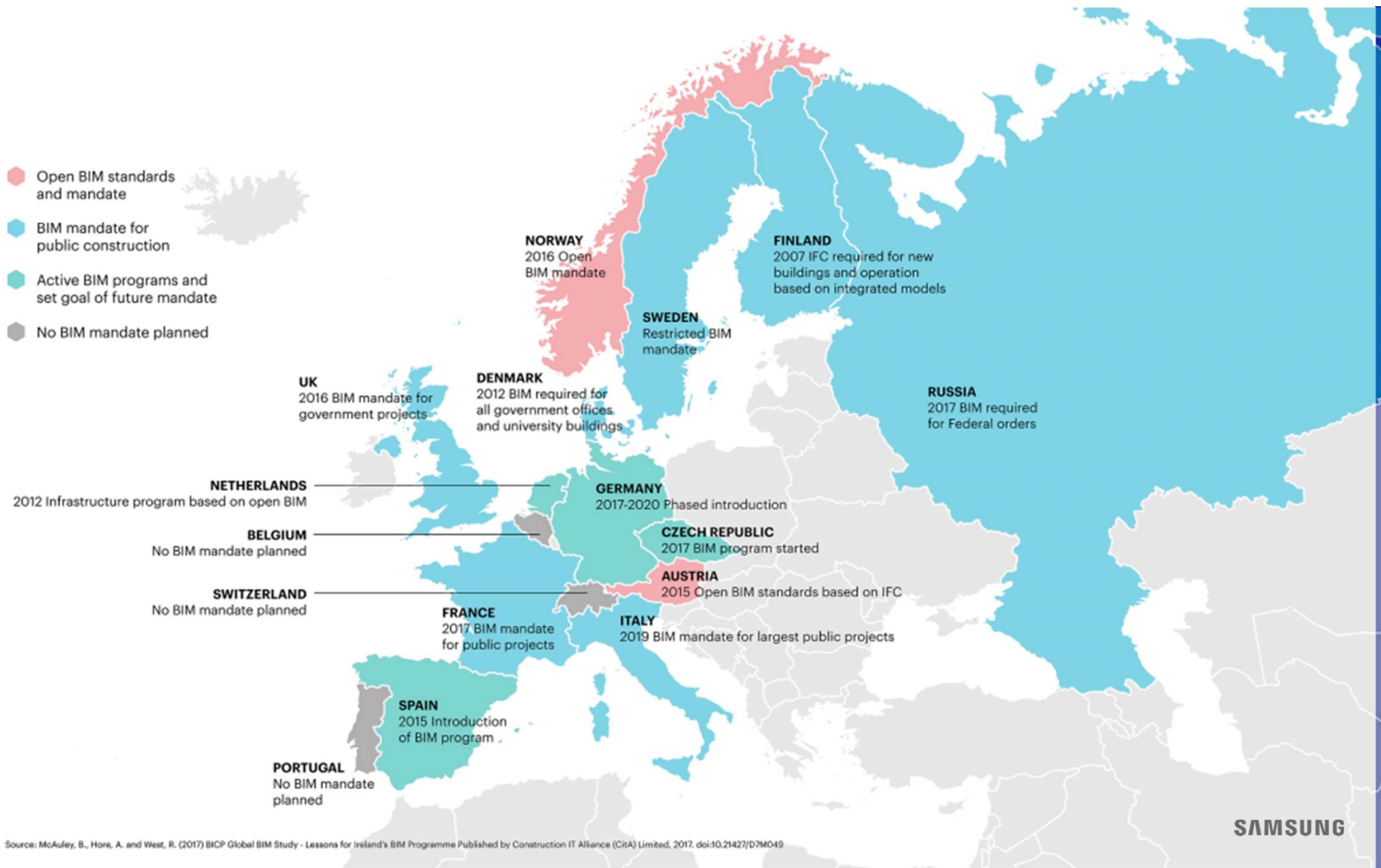
**30%** of construction cost is **rework**<sup>2</sup>



**55%** of maintenance remains **reactive**<sup>3</sup>



- Open BIM standards and mandate
- BIM mandate for public construction
- Active BIM programs and set goal of future mandate
- No BIM mandate planned



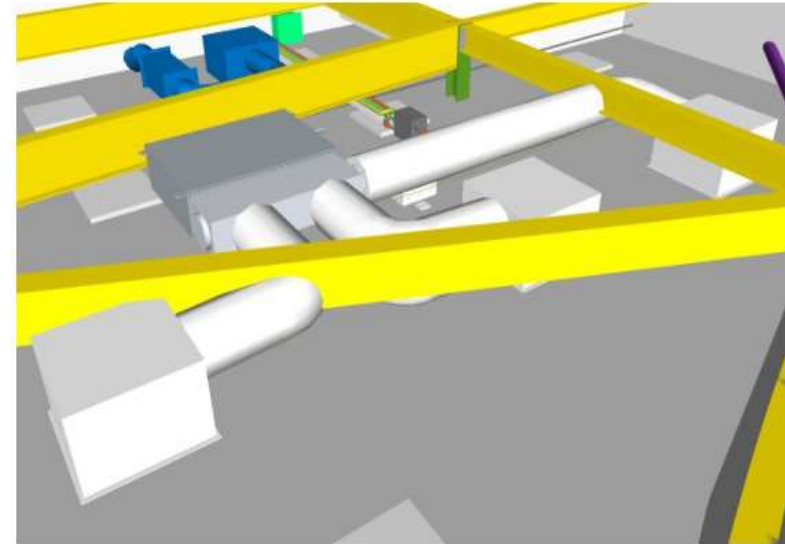
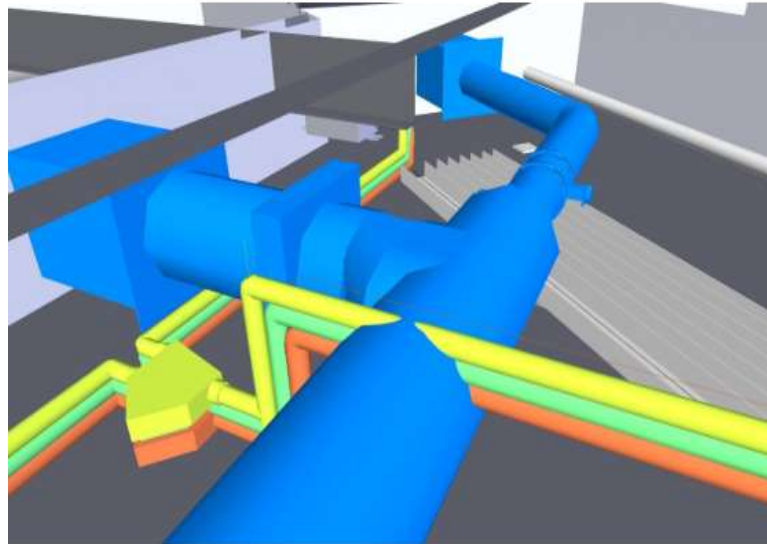
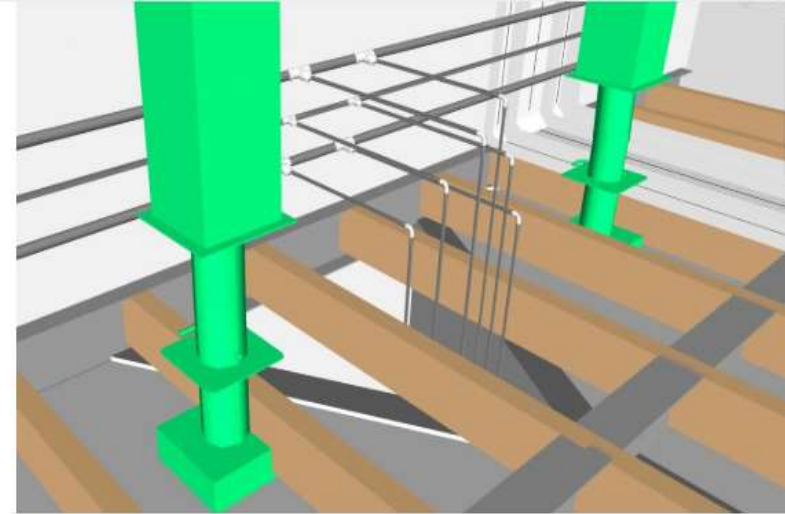
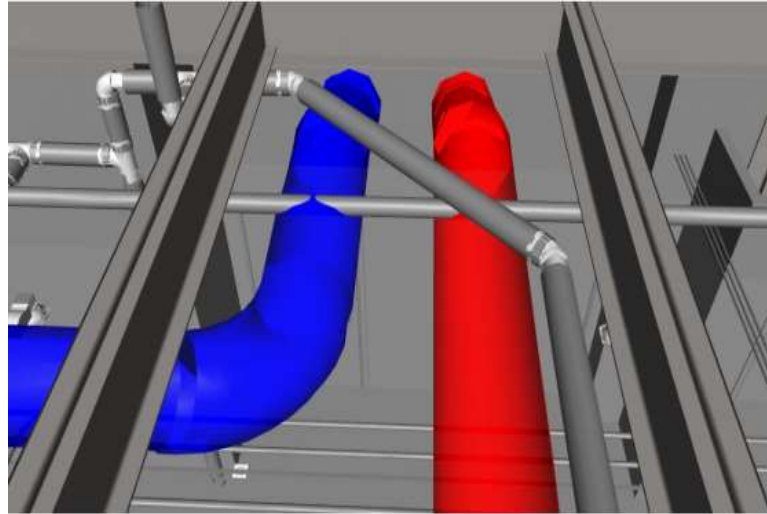
Source: McAuley, B., Hore, A. and West, R. (2017) BICP Global BIM Study - Lessons for Ireland's BIM Programme Published by Construction IT Alliance (CitA) Limited, 2017. doi:10.21427/D7M049

**What are the  
benefits of BIM?**



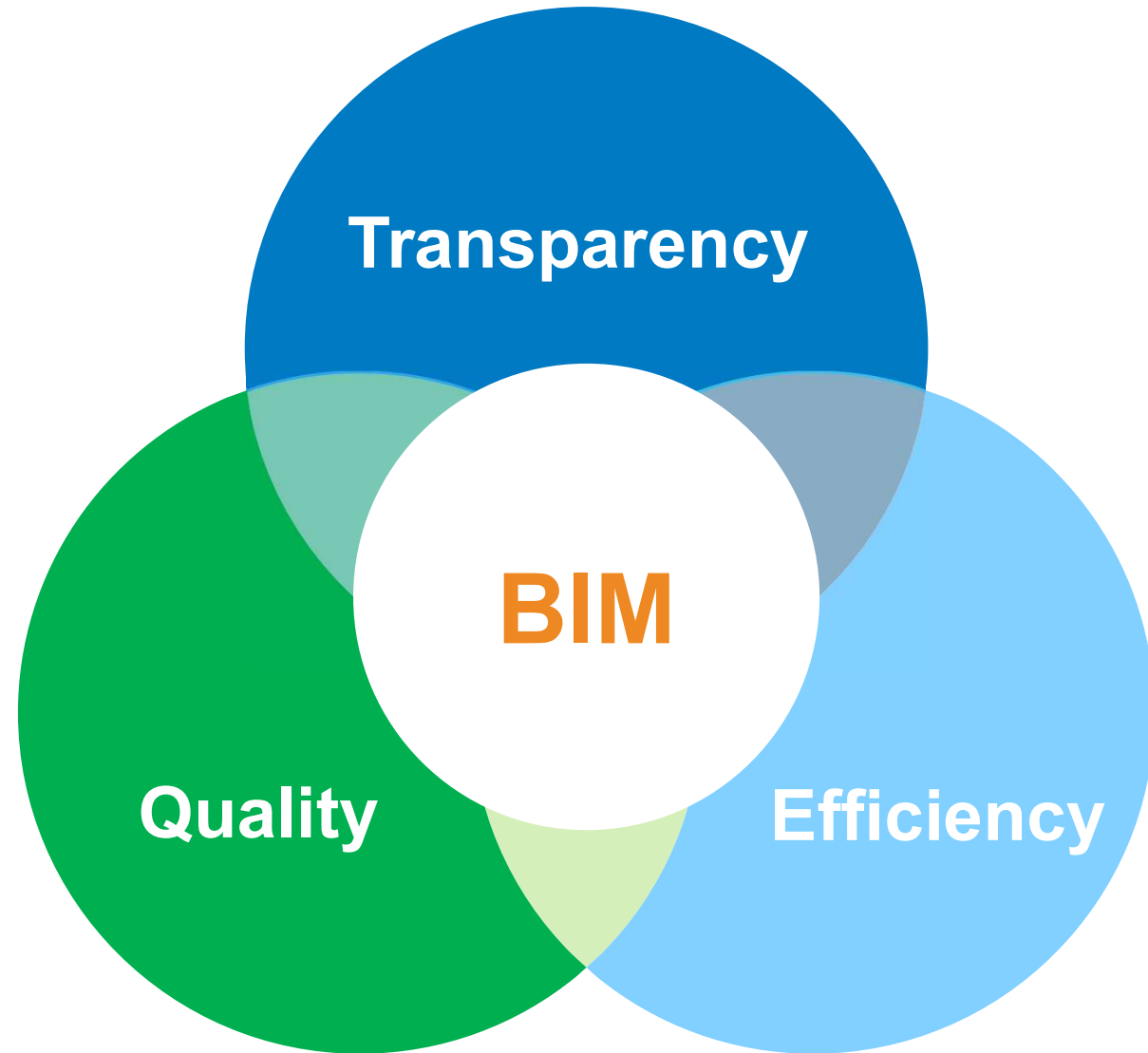
Benefit for engineers:

- **Clash detection**
- **Faster rework**
- **Faster scheduling**
- More details
- Better collaboration
- Better overview of the project
- Easier presentation of project

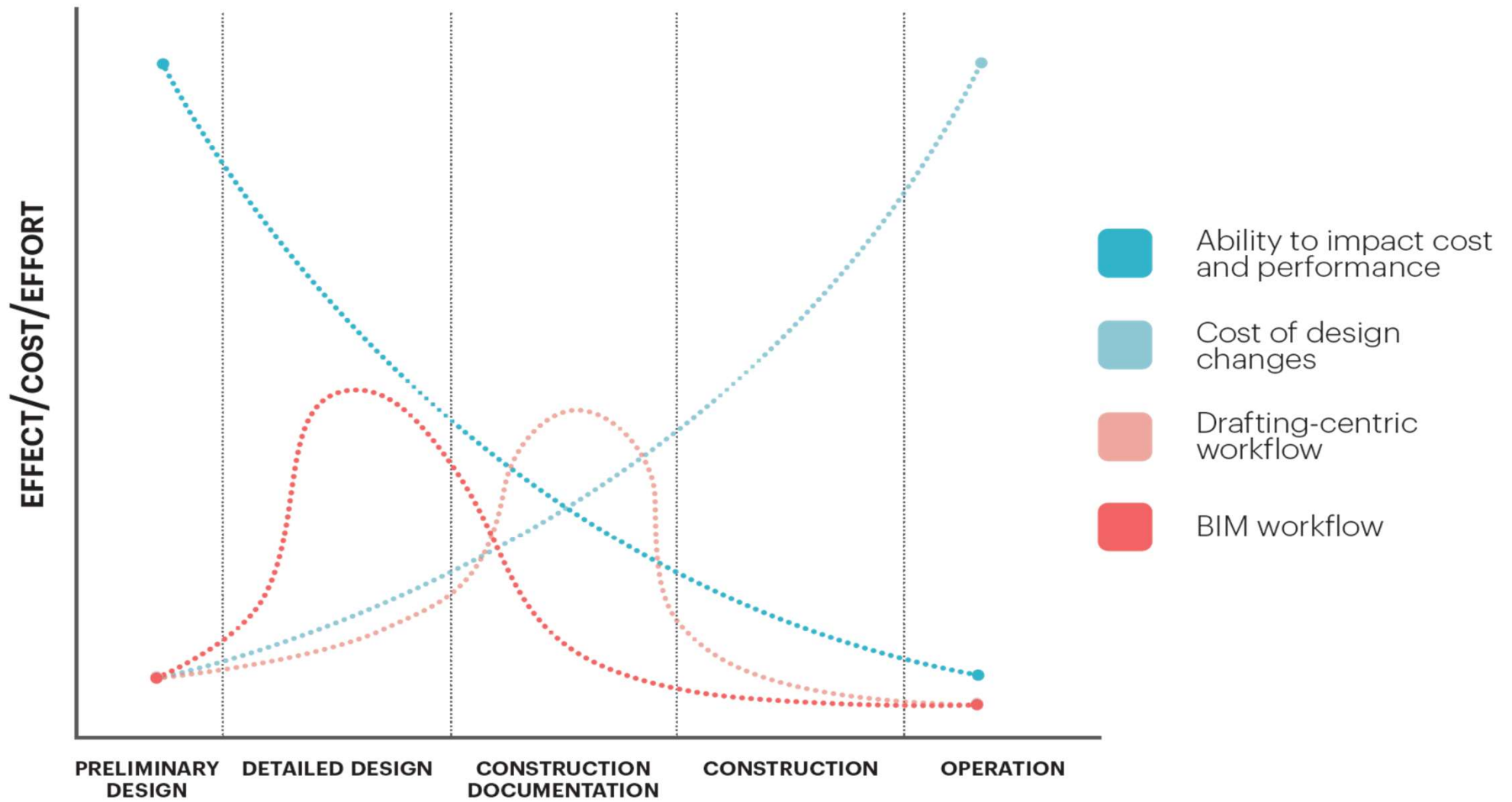


## Benefits for owners, designers, installers, maintenance

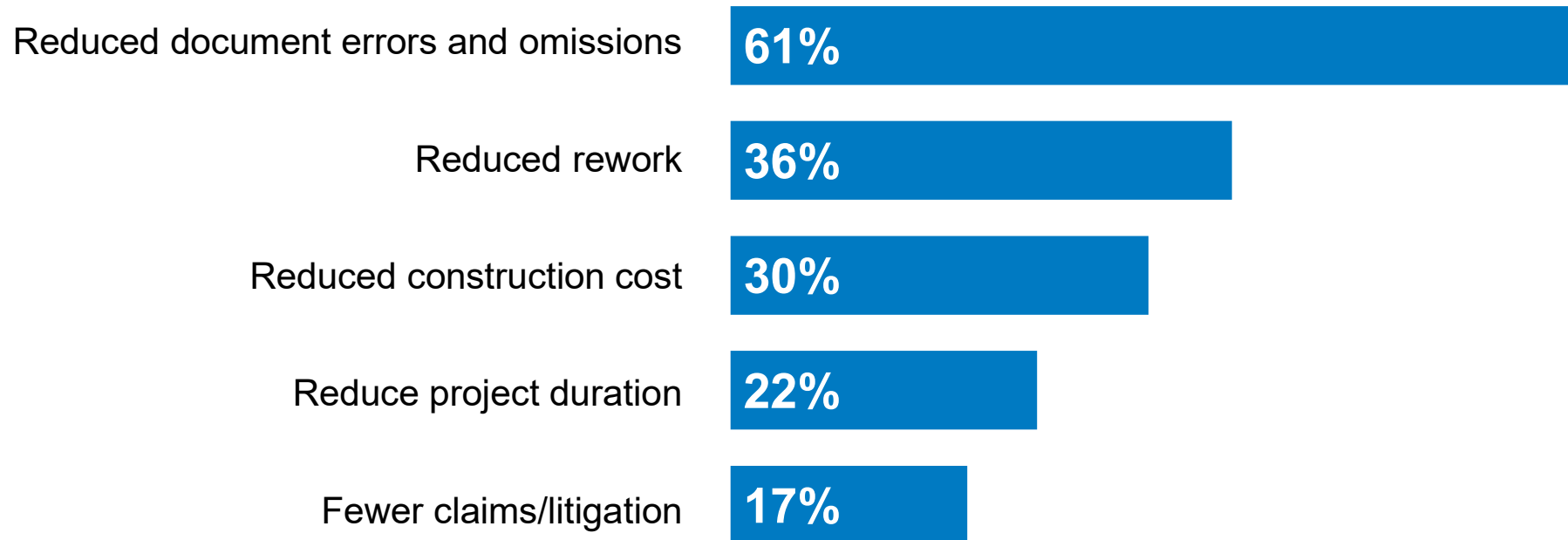
- Data exchange across the project lifecycle = Increased efficiency
- Better Information = Reduce errors and conflicts
- Better communication = Improved results for the client
- A responsive model
- Keep up with competition







## BIM benefits in percentages



**What softwares  
can we use?**



BIM modeling (**Revit**, ArchiCAD, Allplan, Tekla, Sketchup...)

BIM libraries (Bimobject, Avail, MagiCAD, BIM&CO..)

Algorithmic BIM softwares (Dynamo, Grasshopper..)

BIM colaboration (**BIM360**)

BIM validation/checking (**Navisworks**, Revitzo..)

BIM preconstruction and construction

BIM Facility management

BIM execution planning (LOD planner..)



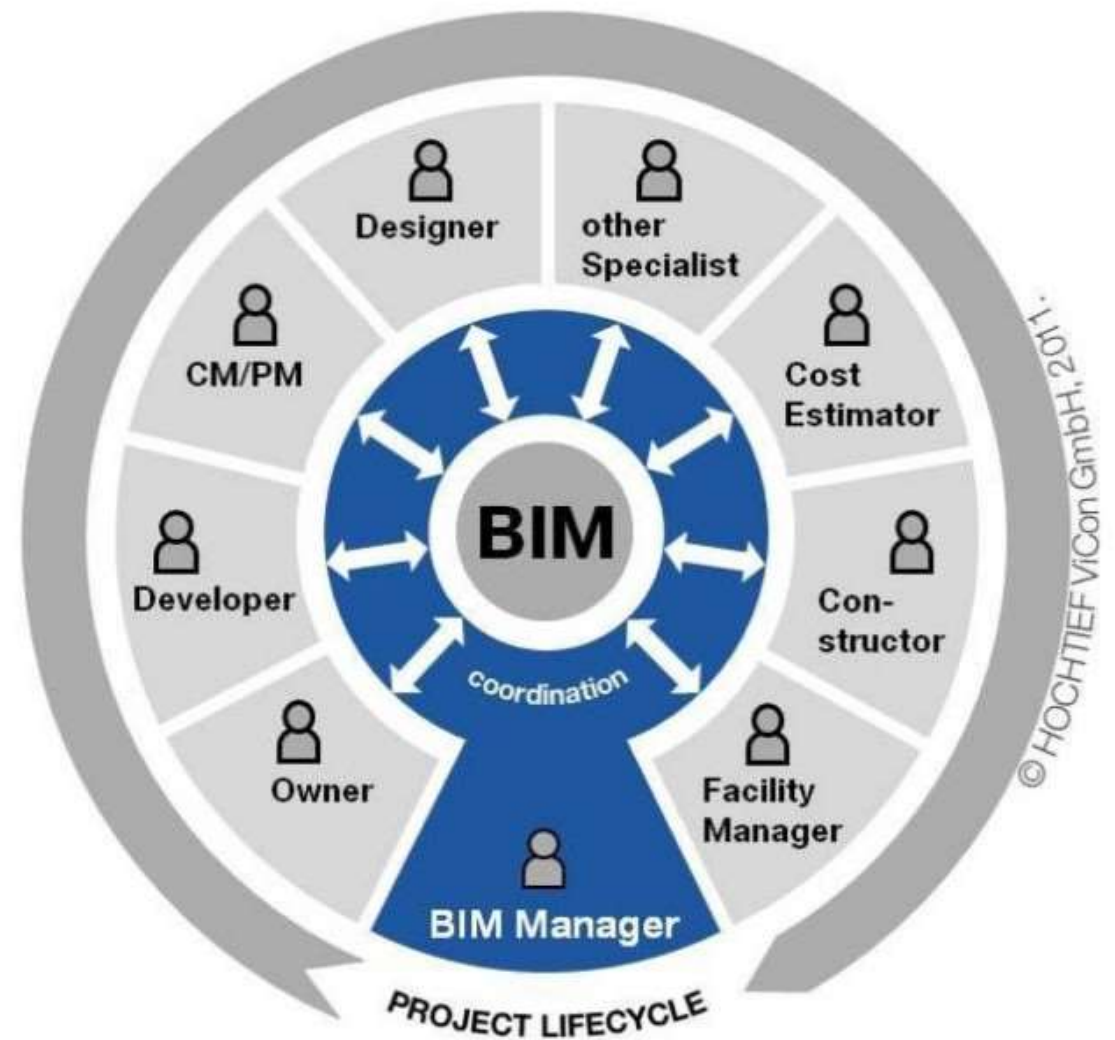
**Who is involved  
in BIM project?  
Rules and  
responsibilities**



## BIM players on project

No.	Construction Player	Role and Responsibilities of Construction Players in Project using BIM
1	Client/Owner	<ul style="list-style-type: none"><li>• Defining a suitable method of using BIM</li></ul>
2	Architect	<ul style="list-style-type: none"><li>• To develop conceptual design.</li><li>• To develop detail design and analysis.</li><li>• To develop construction level information</li><li>• To develop construction documents.</li></ul>
3	C&S and MEP Engineer	<ul style="list-style-type: none"><li>• To develop detail design.</li><li>• To develop shop drawings with detail elements.</li></ul>
4	Contractor	<ul style="list-style-type: none"><li>• Perform constructability analysis</li><li>• Scheduling and planning using 4D model</li><li>• Produce cost reliability</li></ul>
5	Quantity Surveyor (QS)	<ul style="list-style-type: none"><li>• To extract quantities and produce cost estimation from the 3D model</li></ul>
6	Facility Manager	<ul style="list-style-type: none"><li>• To put the information of building into the 3D model for the purpose of FM.</li></ul>

- BIM Manager – project role
- BIM Coordinators – project role
- BIM Facilitator
- BIM) Project Manager
- Design Team BIM Manager/ Construction BIM Manager
- Project Model Manager
- Information Manager
- BIM Process Manager
- BIM Lead Coordinator
- BIM Coordinator
- Discipline BIM Coordinator/ Design BIM Coordinator
- Lead BIM Coordinator
- BIM Discipline Manager
- Model Manager
- Project Model Leader
- BIM Modeller
- BIM Manager – organizational role
- BIM Modeller – organizational role



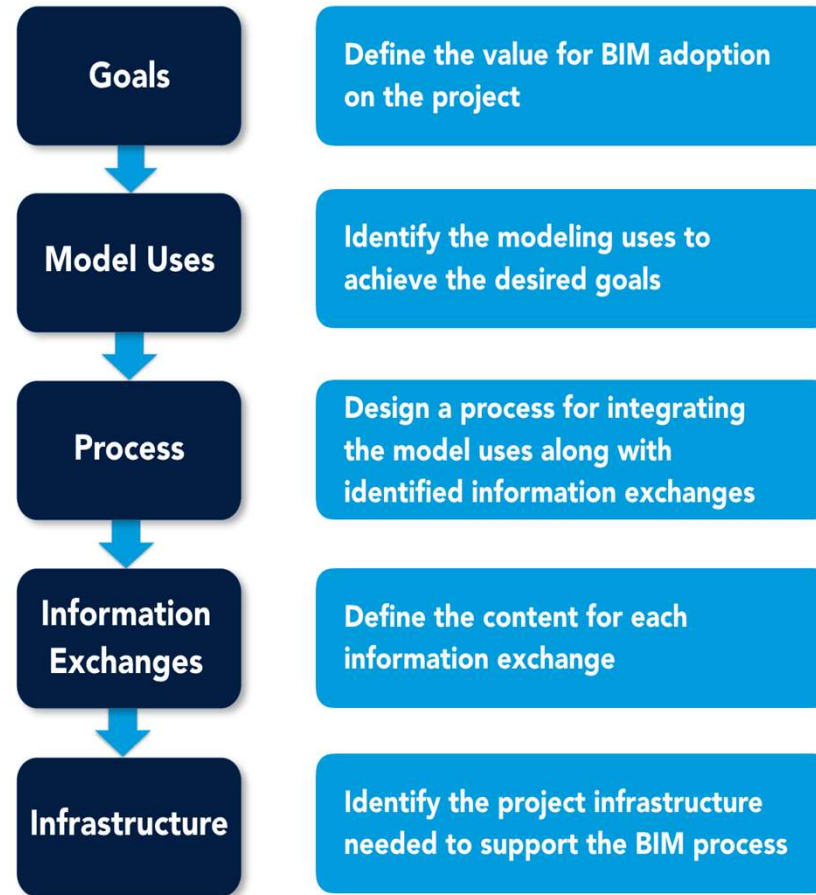
**Where to begin  
with BIM?**



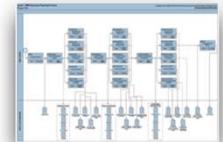
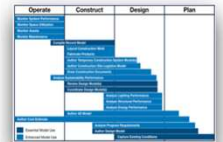


# Following points ease the use of BIM on a project

- Revit template for required discipline (default is inside Revit, but best is to have company specific template with all BIM project properties defined)
- Revit families library with all families properly designed and archived so that modeling is faster and more efficient
- Definition of BEP in the beginning of the project so all involved know what to do and what to deliver in each stages of the project
- Technical support for less experience users in form of consulting and guidance



Priority	Project Goal	Potential BIM Uses
1	Meet a high number of design and construction goals	Design, Modeling, Clash
1	Minimize the number of requests for the building	Design, Modeling, Clash
1	Improve the quality of construction	Design, Modeling, Clash
1	Improve the speed of construction	Design, Modeling, Clash
1	Improve the accuracy of the final building design	Design, Modeling, Clash
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Information Exchange	Exchange Type	Exchange Content	Exchange Format	Exchange Frequency	Exchange Location
Design	Model	3D Model	IFC	Weekly	Project Office
Construction	Model	4D Model	IFC	Weekly	Project Office
Post	Model	5D Model	IFC	Weekly	Project Office



# Revit template

## - Samsung development

- SEAD developed Mechanical template (metric, SI) for easier designing in Revit with the following details input inside template:

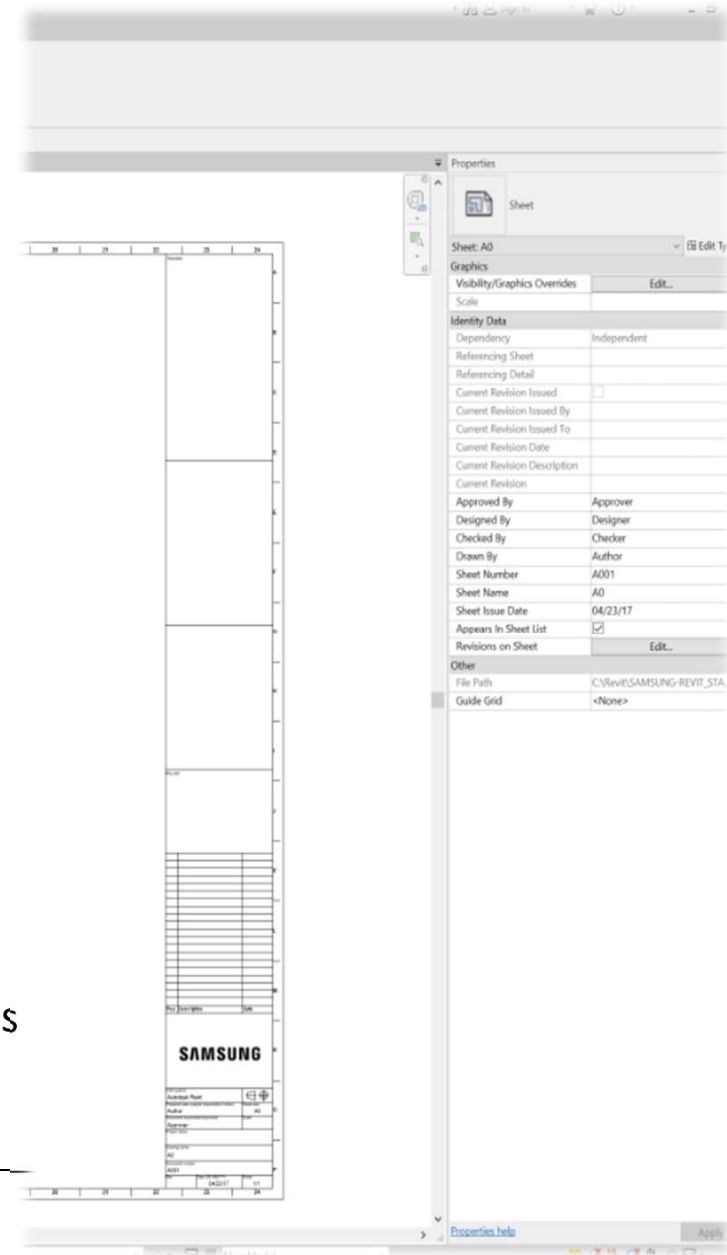
### CUSTOMIZED SETTINGS

- Starting View is INFO legend with details
- Decimal delimiter can be comma or dot
- Standardized text size and font (Arial) with leader arrows
- Fill patterns (drafting and model)
- View Templates (mechanical, structural, architectural)

### MECHANICAL SETTINGS

- Duct and Pipe settings, Pipe types, Pipe systems, Duct fittings, Duct systems

SCHEDULES, MATERIALS (Samsung Blue and Black), LEGENDS, FAMILIES..



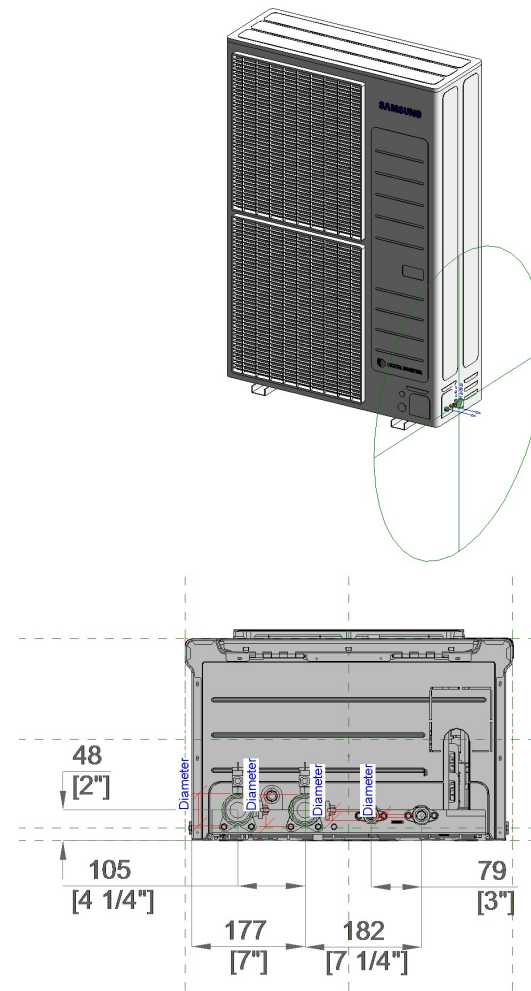
# Revit families


## - Samsung development

- Each product family is 3D model with relevant data inserted inside family parameters (pipe sizes and connections, refrigerant type and quantity, noise and cooling loads, etc.)

### BENEFITS

- Unit model is like a 3D data sheet
- All relevant data on one place
- Enables 3D design / schedules of equipment
- Improves visualization of the project, clash-free models
- better multidisciplinary collaboration and reduces re-work
- Available on Partner Portal, soon on BIMobjects



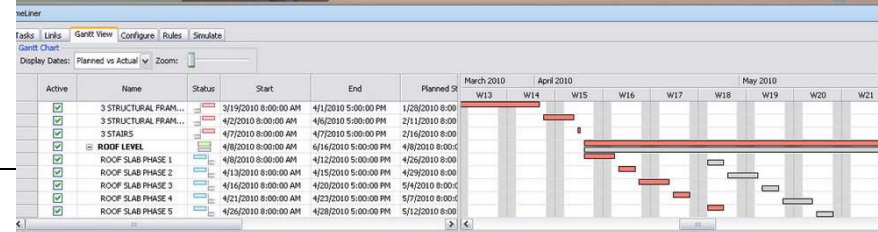
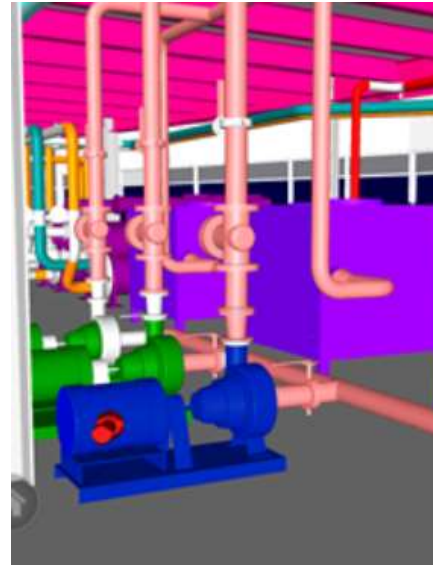
	<b>EU_EHS_ODU_UB3</b> 12.00 kW, 220-240V, HEAT PUMP, SPLIT
Mechanical Equipment (▼) Edit Ty	
Materials and Fin... ^	
Equipment Finish: Ivory	
Electrical ^	
Phase	1/3
Voltage	220-240 V
Number of poles	-
Maximum Rate...	Fuse
Frequency	50 Hz
Electrical - Loads ^	
Power Input He...	2590.00 W
Power Input Co...	3100.00 W
Minimum Circui...	28.00 A
Maximum Over...	35.00 A
Current Input H...	11.70 A
Current Input C...	14.00 A
Panel	
Circuit Number	
Mechanical ^	
Condenser Type	
Friction Head L...	0 kPa
Max Operation...	0 Mpa
Sound Pressure...	50.00 dB(A)
Sound Power(C	64.00 dB(A)

# Revit technical support

## - Samsung

- SEAD is offering consulting sessions and complete project collaboration in case of BIM project with collaboration from start to finish of the project, filling roles of:

1. BIM Manager
2. BIM Coordinator
3. BIM division LEAD (MEP)
4. BIM MEP designer
5. BIM family modeller
6. BIM VR and AR consultant
7. BIM integrator



**Additional  
benefits of BIM?**



- Virtual reality (VR)
- Artificial reality (AR)
- Facility management (FEM)
- Visual programming for faster designs
- Designer robots (automatisation of design process)
- Paperless site projects



**SAMSUNG**

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Thank you!

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