Leveraging Connected Data For Predictive Cost and Planning Outcomes

CitA Automation Series 2025

KOSMOS

30/05/2025

Ross Griffin

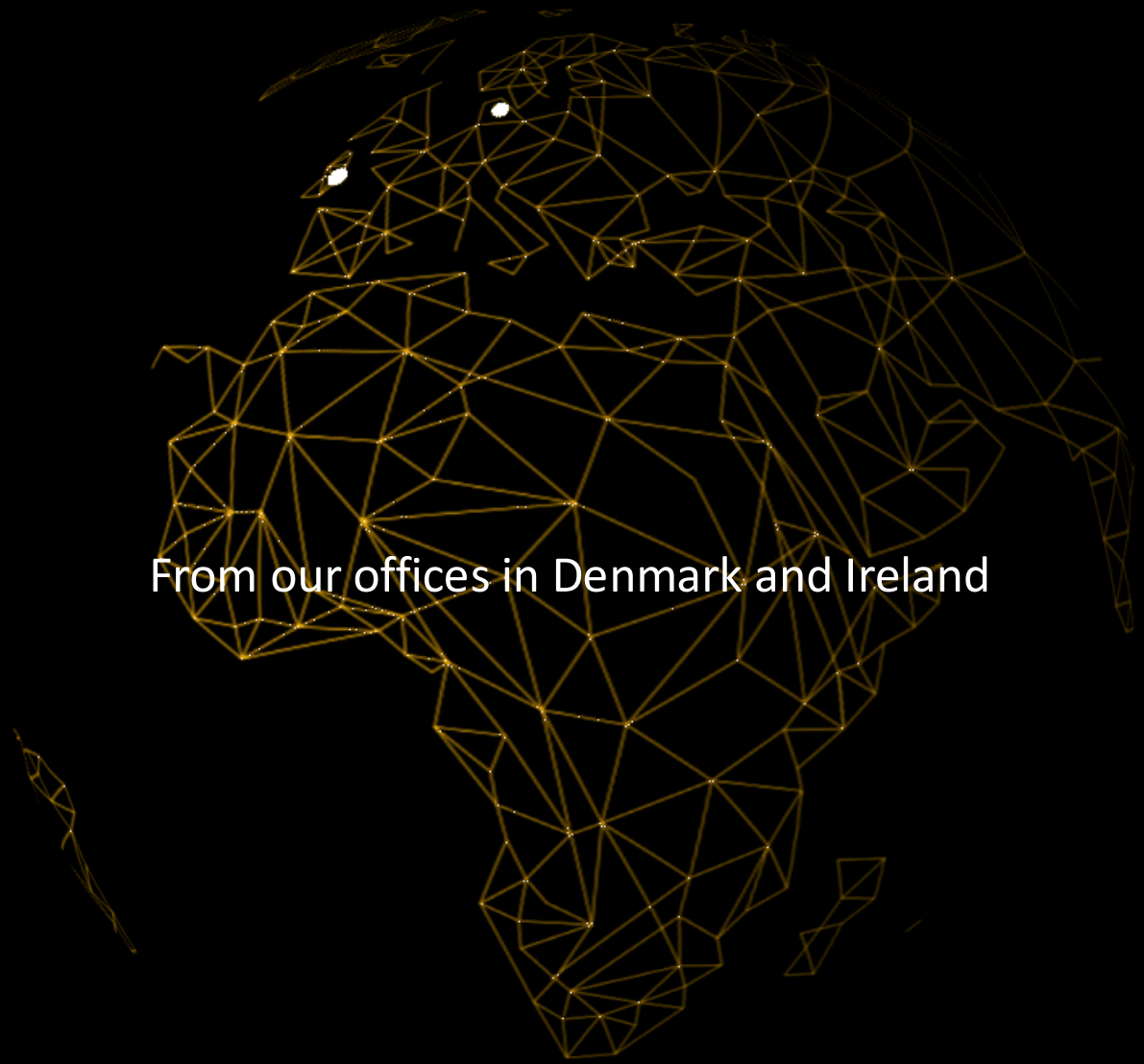
Founder of KOSMOS
A specialist digital cost
& carbon quantity surveying consultancy

Founder of The Fifth Dimension
A specialist cost & carbon data collection
& analytical cloud based software

KOSMOS

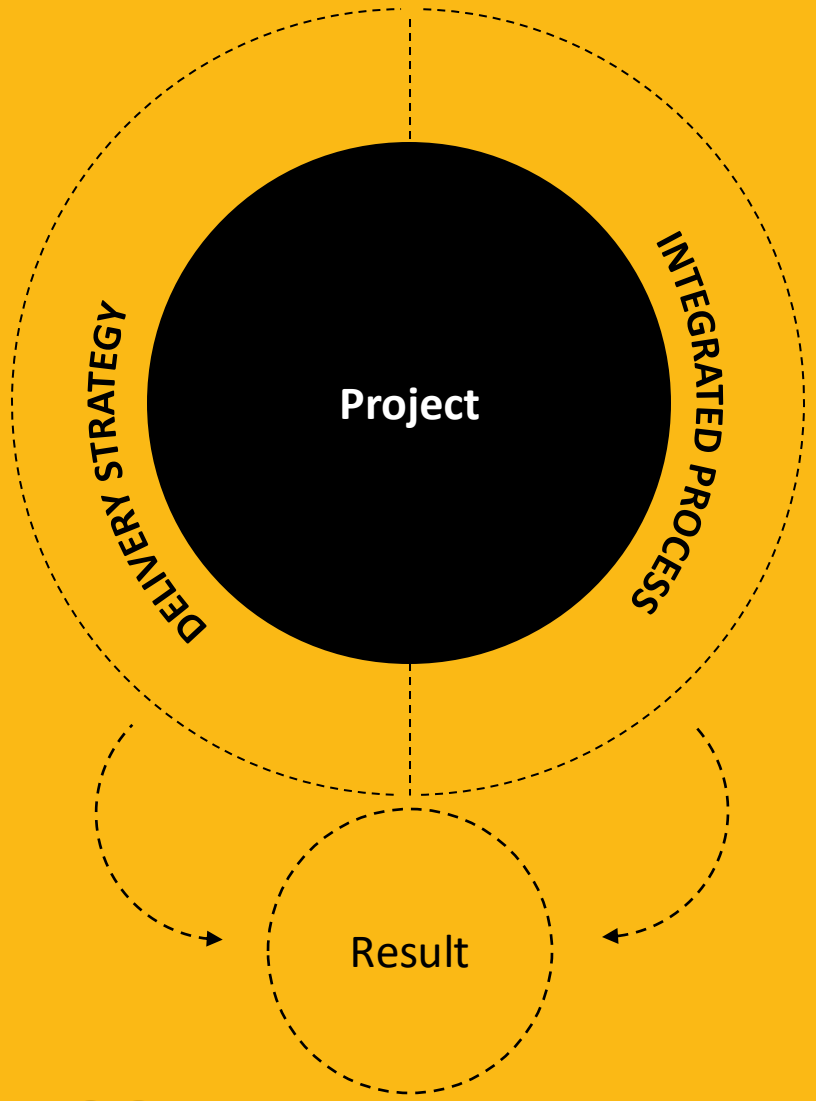
We are **KOSMOS**

This is digital and carbon quantity surveying on a global level



From our offices in Denmark and Ireland

Greenland
Denmark
Poland
Ireland
Czech Republic
Hungary
USA
China
Mexico
Vietnam
With Global clients
Singapore
Australia

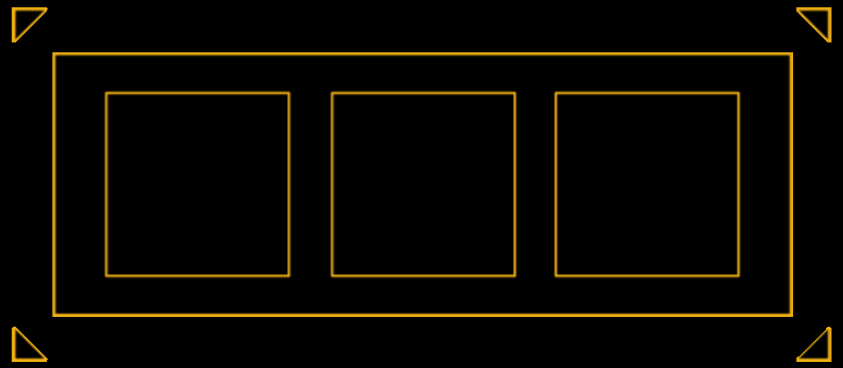


Scope of the presentation

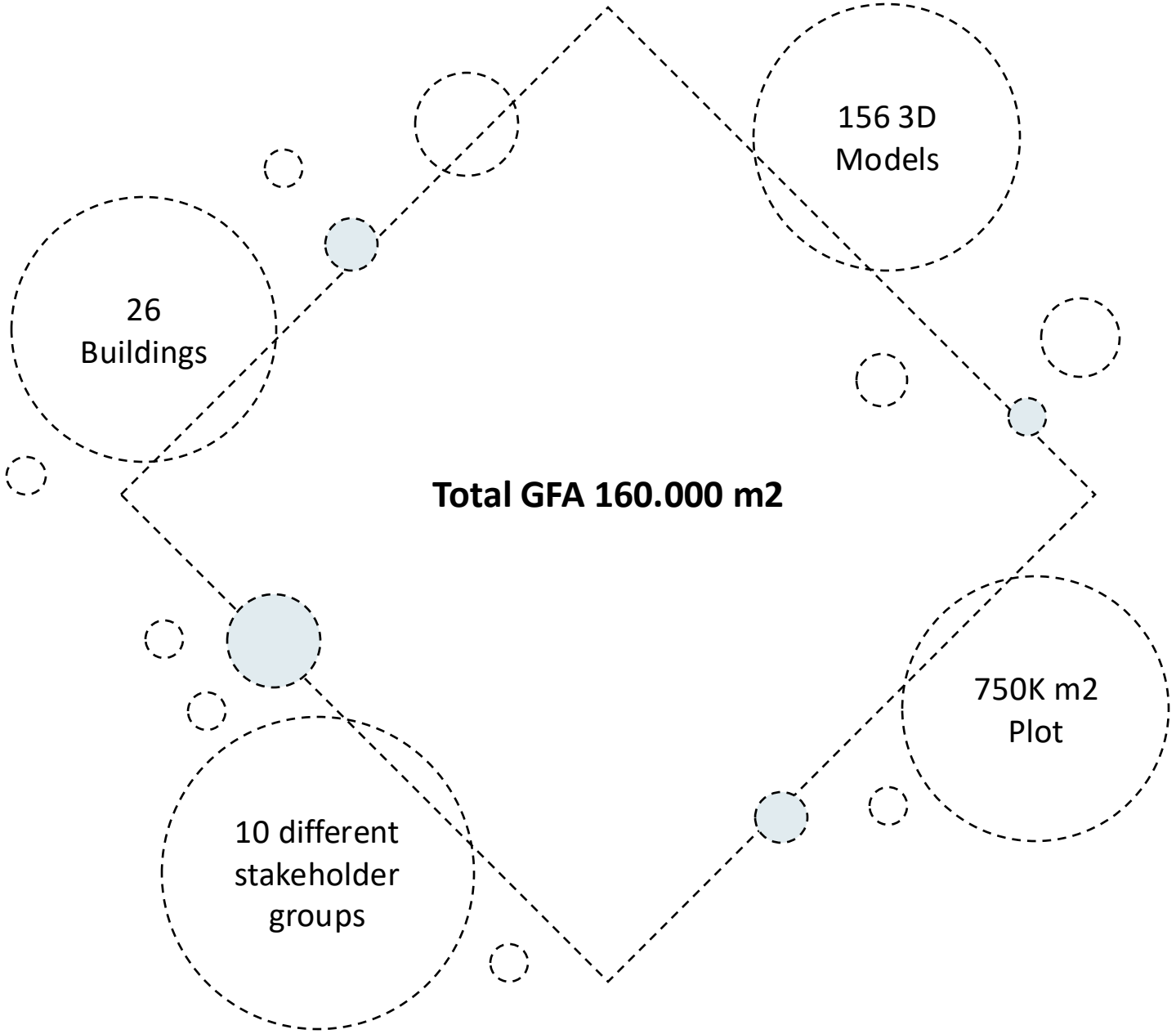
Value Driven Cost & Carbon Management

is an integrated collaborative approach to designing to cost/carbon, as well as continuous cost/carbon follow up & control

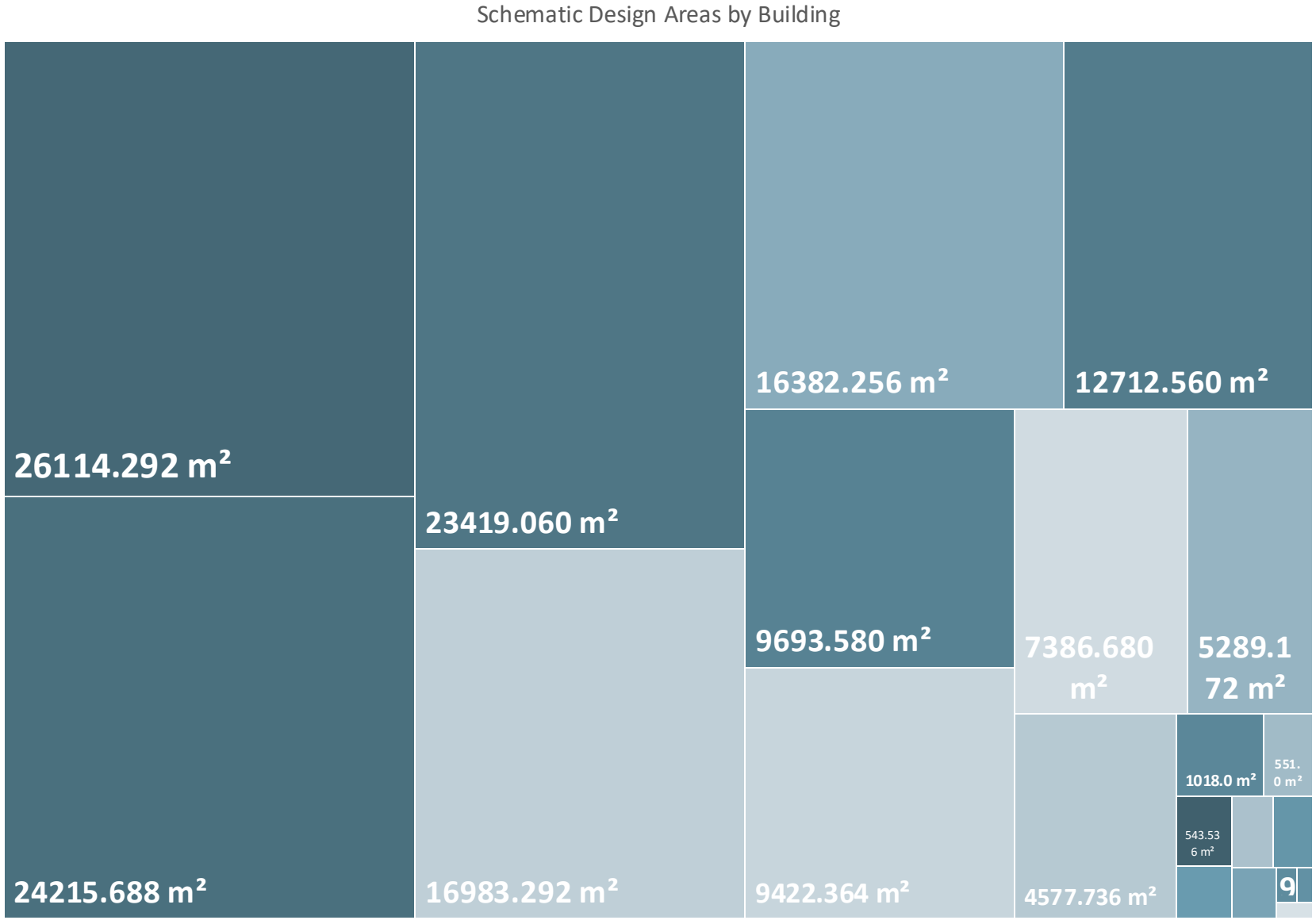
The Project



Project Key Figures



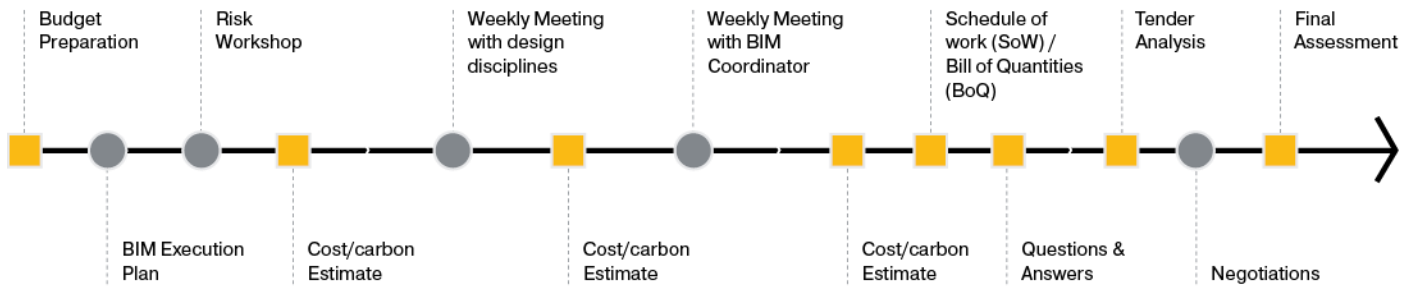
Building Areas



Delivery Strategy

Commercial/ Cost & Carbon Management Strategy

Phase 1: Business Case/ Concept	Phase 2: Schematic	Phase 3: Detailed Design	Phase 4: Tender Phase	Phase 5: Execution
> Preparation of the project Review and finalisation of the BIM execution plan	> Focus on major cost/carbon drivers	> Focus on major cost/carbon drivers	> Preparation of Schedule of Works/ Bill of Quantities	> Monthly cost/carbon report
> Initial discussions with the design team on naming conventions, standards, etc	> Monthly updates of cost & carbon report	> Monthly updates of cost & carbon report	> Review of all tender material & align with design team	> Management of change and variations
> Initial procurement strategy discussions	> Assessment of potential risk	> Assessment of potential risk	> Review all general & preamble material	> Management of claims
> Assessment of potential Value Engineering opportunities	> Close dialogue with design team on design & BIM quality	> Weekly meetings with BIM coordinator & discipline leads	> Assist in answering contractor queries during tender	> Monthly valuations & recommendations
> Assessment of potential risk	> Management and recording of change and cost/carbon impact	> Management and recording of change and cost/carbon impact	> Assess & analyses contractor bids	> Upload data to database
> Delivery of Concept estimate at end of phase	> Preparation of Schematic design estimate at the end of the phase	> Preparation of Detailed design estimate at the end of the phase	> Prepare qualification & clarification for contractor	> Final account agreements
> Initial Embodied Carbon assessment and strategy establishment	> Preparation of the Schematic design embodied carbon calculation	> Preparation of the detailed design embodied carbon calculation	> Reconcile contractor bid so that all gaps are identified	> Change management
> Upload data to database	> Upload data to database	> Upload data to Database	> Upload data to database	> Risk management



Phase 1: Business Case/ Concept

- Preparation of the project Review and finalisation of the BIM execution plan
- Initial discussions with the design team on naming conventions, standards, etc
- Initial procurement strategy discussions
- Assessment of potential Value Engineering opportunities
- Assessment of potential risk
- Delivery of Concept estimate at end of phase
- Initial Embodied Carbon assessment and strategy establishment
- Upload data to database

Phase 2: Schematic

- Focus on major cost/carbon drivers
- Monthly updates of cost & carbon report
- Assessment of potential risk
- Close dialogue with design team on design & BIM quality
- Management and recording of change and cost/carbon impact
- Preparation of Schematic design estimate at the end of the phase
- Preparation of the Schematic design embodied carbon calculation
- Upload data to database

Phase 3: Detailed Design

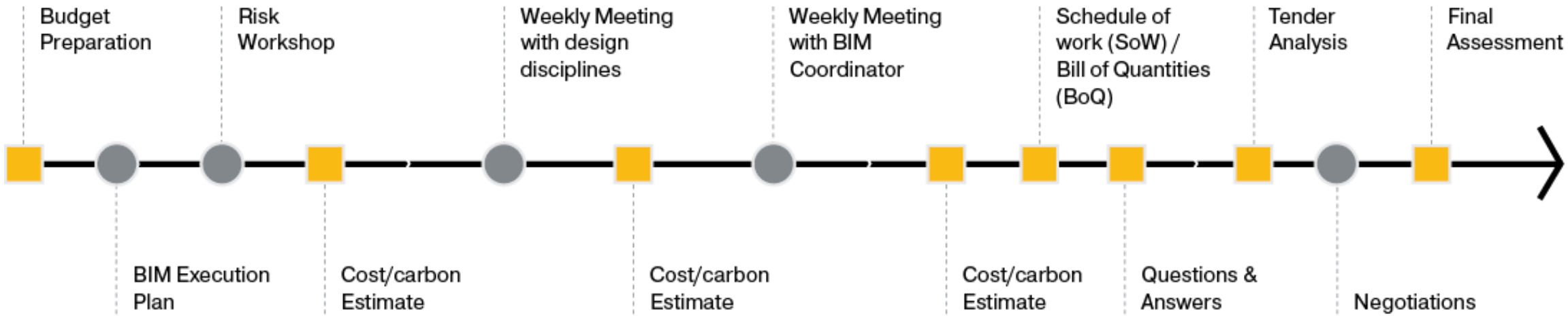
- Focus on major cost/carbon drivers
- Monthly updates of cost & carbon report
- Assessment of potential risk
- Weekly meetings with BIM coordinator & discipline leads
- Management and recording of change and cost/carbon impact
- Preparation of Detailed design estimate at the end of the phase
- Preparation of the detailed design embodied carbon calculation
- Upload data to Database

Phase 4: Tender Phase

- Preparation of Schedule of Works/ Bill of Quantities
- Review of all tender material & align with design team
- Review all general & preamble material
- Assist in answering contractor queries during tender
- Assess & analyses contractor bids
- Prepare qualification & clarification for contractor
- Reconcile contractor bid so that all gaps are identified
- Upload data to database

Phase 5: Execution

- Monthly cost/carbon report
- Management of change and variations
- Management of claims
- Monthly valuations & recommendations
- Upload data to database
- Final account agreements
- Change management
- Risk management


Budget Preparation
Risk Workshop
Weekly Meeting with design disciplines
Weekly Meeting with BIM Coordinator
Schedule of work (SoW) / Bill of Quantities (BoQ)
Tender Analysis
Final Assessment
BIM Execution Plan
Cost/carbon Estimate
Cost/carbon Estimate
Cost/carbon Estimate
Questions & Answers
Negotiations

Phase 1: Business Case/ Concept	Phase 2: Schematic	Phase 3: Detailed Design	Phase 4: Tender Phase	Phase 5: Execution
> Preparation of the project Review and finalisation of the BIM execution plan	> Focus on major cost/carbon drivers	> Focus on major cost/carbon drivers	> Preparation of Schedule of Works/ Bill of Quantities	> Monthly cost/carbon report
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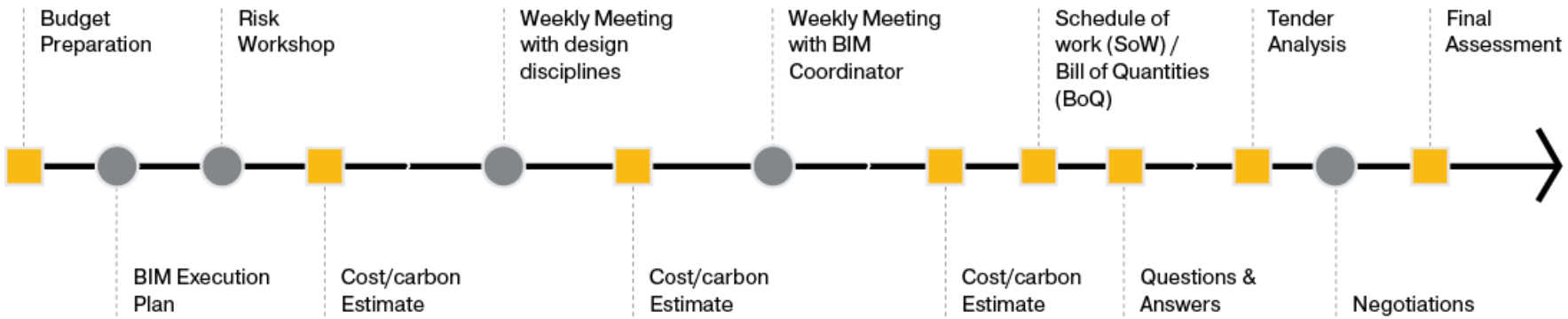
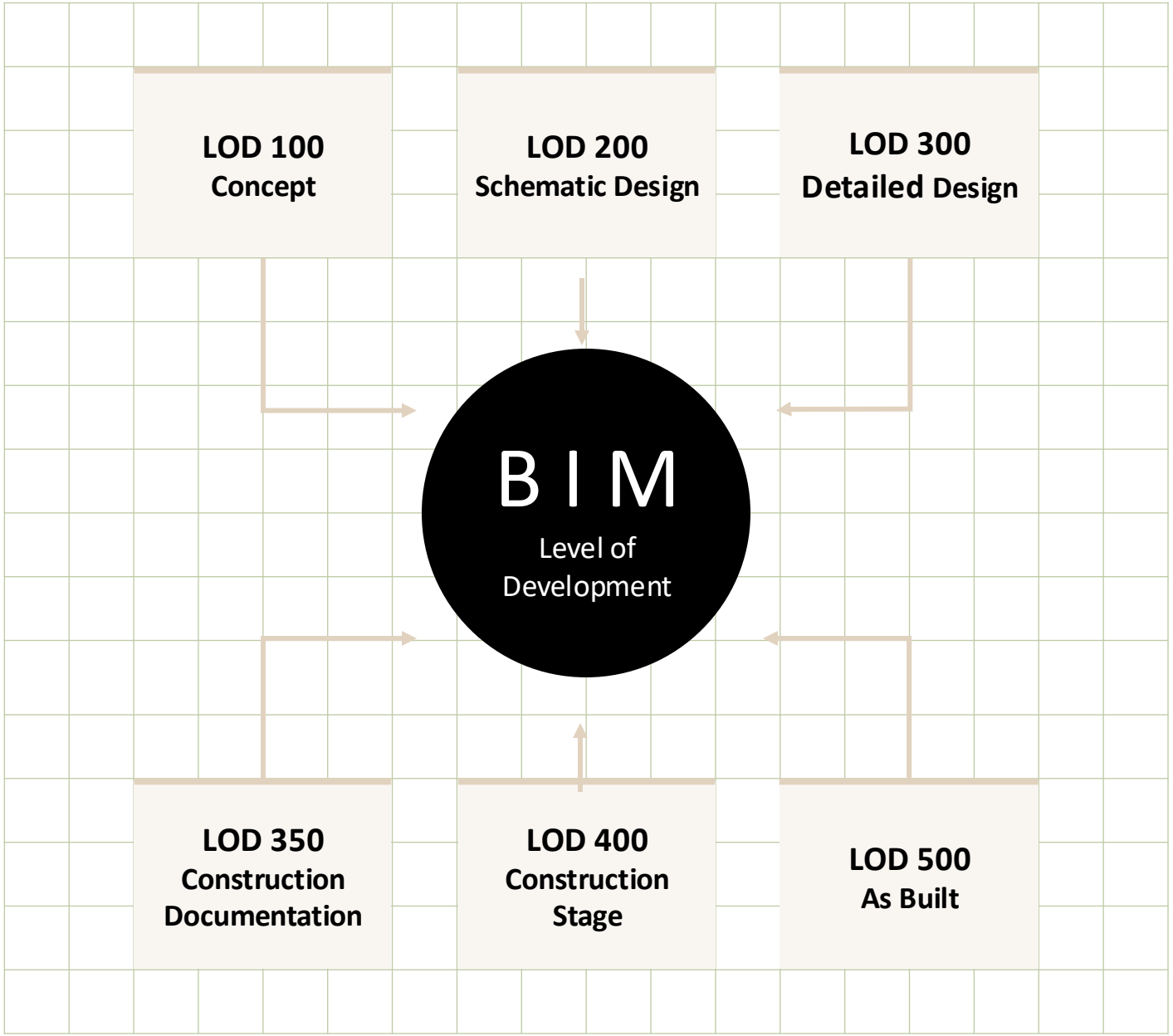


Understanding what will be delivered:

What level of detail to expect in the models at each stage/gateway (LOD 100, 200, 300, 350, 400, 500)



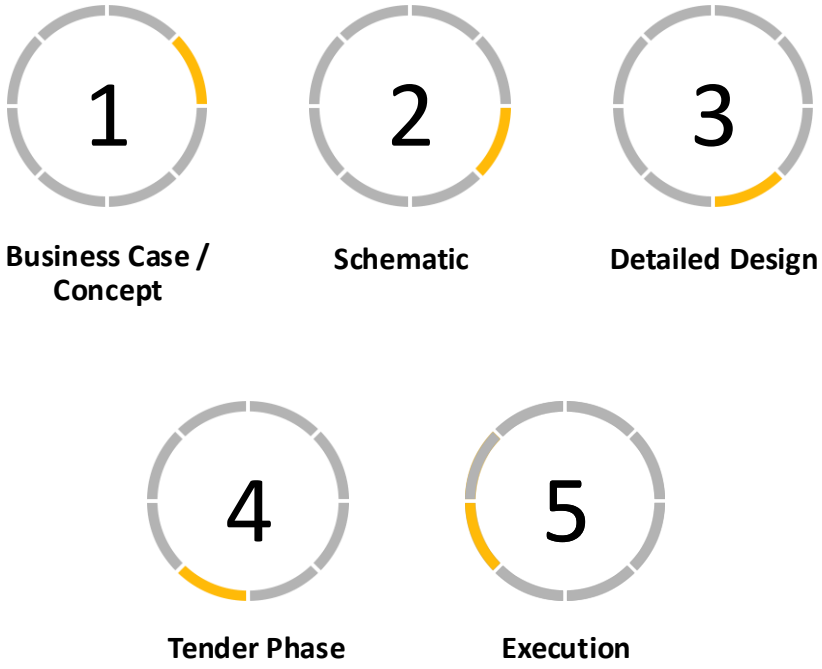
BIM Execution Plan

A BIM Execution Plan (BEP) is essential for all projects, regardless of size or nature. As Quantity Surveyors and Cost Managers, we utilize the information generated within the BEP strategy.

Information Requirements

Understanding what will be delivered:

- What level of information to expect in the models at each milestone
- Develop the BEP so the information can be used by all stakeholders, not just the design team

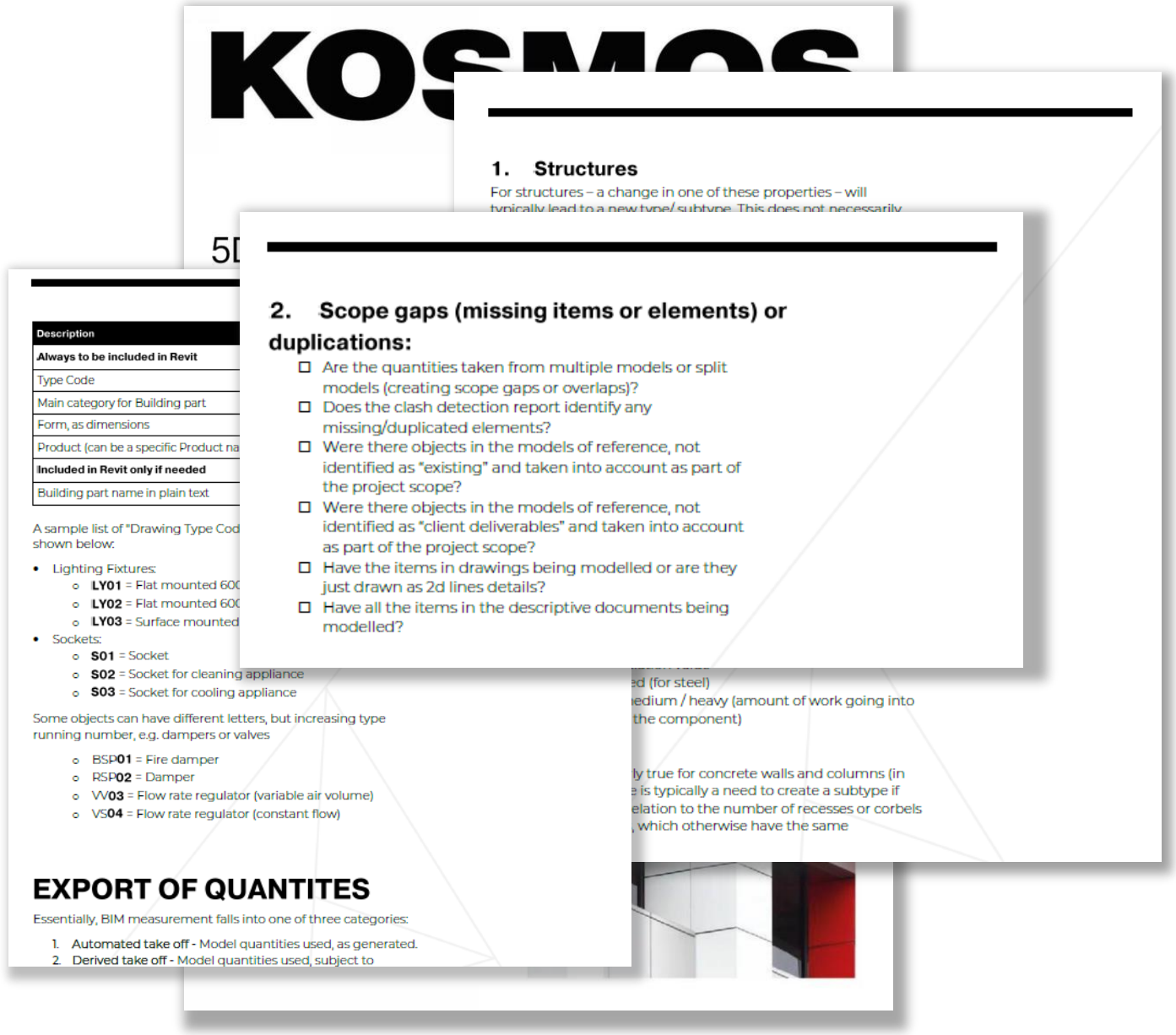


5D Requirements

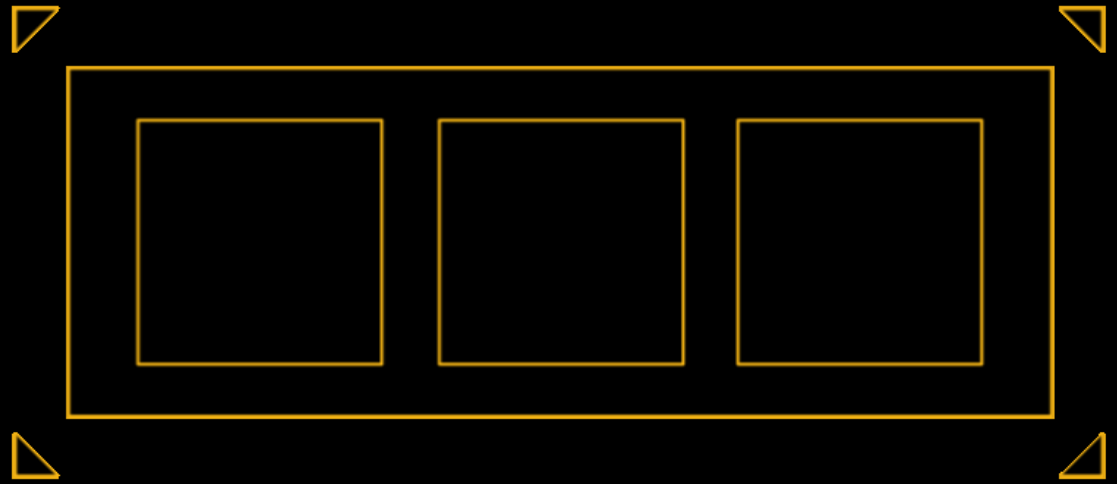
Importance of the IFC and 5D exchange information

Quality of information, accuracy

and what is not included.



Modelling



BIM Execution Plan
BEP Appendices – LOI Matrix

Obejct Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard paramenter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design		Detailed Design		Construction	Operation
													Schematic Design	Design Proposal	Preliminary Design	Execution Design	Project Execution	Handing over to Operation
Property	Project Information	**Building Number**	Building number – according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	30-01	D					
		Property BBR	BBR Property number (Only used in Danish projects)	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Parcel	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	0685/20		D				
		Land area	Area, cadastral. (Whole property measured in m2)	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code – with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	HU, MX, DK, CN and CZ		D				
		Function	Function – with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Final handover date to LFAC	X	X	No	NO	Ins	Text	Identity Data	Project Information	2017-10-17 (Year-Month-Day).		D				
Spaces	Rooms	**Number**	Room number – with reference to: Country,Building and Part, Level and Serial Number. For basements: B1,B2, B3 etc. For mezzanine: M1, M2, M4 etc.	X	X	Yes	YES				Rooms	HU,3001,201 HU – Country code 30 – Building number 01 – Building part 2 – Floor (level) 01 – Serial number of the room		D				
		Name	Room description	X	X	Yes	YES				Rooms	Elevatorshaft Staircase, etc.		D				
		Name Local	Alternative room name, e.g. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D				
		Room Classification	OmniClass, Table 13, Spaces by function	X	X	No	NO	Ins	Text	Identity Data	Rooms	13-23 11 11 11 The example is made for elevator shaft		D				
		Level	Room level location	X	X	Yes	YES				Rooms	B2 for Basement 2 02 for 2nd Floor		D				
		Building	Location of room in the building (Building Number and Building part)		X	No	NO	Ins	Text	Identity Data	Rooms	3001 30 – Building number 01 – Building part		D				
		Heated	Heated: True/False		X	No	NO	Ins	Yes/ No	Other	Rooms			D				
		Area	Net area with reference to DS/EN 15221-6, method 5.10 (Net Room Area)	X	X	Yes	YES				Rooms	110		D				
		Volume	Net volume belonging to Net area with reference to DS/EN 15221-6, method 5.10 (Net Room Area)	X	X	Yes	YES				Rooms	330		D				
		Computation Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D				
		Unbounded Height	Net height in the room (ceiling height)	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D				
		Area Type	Area type – with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Shop		L				
		Security Level	Security Level – with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L
		Reverberation time	In relation to the sound condition of the rooms filled after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	1.3 Use dot (".") and not comma (",") for the decimal separation		D				

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buthbars and switchgears/boards	X	X	Yes
Underground installations	If installations is underground	X	X	Yes
System Type *(Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table)*	System code plus name for technical installations, must be unique to the system	X	X	Yes

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

Properties Parameters

Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for CTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design: Schematic Design	Conceptual Design: Design Proposal	Detailed Design: Preliminary Design	Detailed Design: Execution Design	Construction: Project Execution	Operation: Handing over to Operation
Property	Project Information	Building Number	Building number – according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	0047	D					
		Property BBR	BBR Property number (Only used in Danish projects)	X	X	Yes	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Parcel	Land Parcel and building primer association	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	008820		D				
		Land area	Area, cadastral. (Whole property measured in m2	X	X	Yes	NO	Ins	Text	Identity Data	Project Information			D				
		County Code	County code – with reference to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	Fx. NY, SH, CH, and TE		D				
		Function	Function – with reference to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Final handover date to UHC	X	X	Yes	NO	Ins	Text	Identity Data	Project Information			D				
Spaces	Rooms	Number	Room number – with reference to County, Building and Part Level and Serial Number. For basements: B.st, B.se etc. For mezzanine: M, M2, M+etc	X	X	Yes	YES				Rooms	[Country]-[Municipality]-[Building]-[Building part]-[Part level]-[Serial number of the room] Fx: NY-KBH-01-00-01-0001 NY = Country code 00 = Building number 01 = Building part 0 = Part level 0001 = Serial number of the room		D				
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Stairwell etc.		D				
		Name Local	Alternative room name e.g. in local language	X	X	Yes	NO	Ins	Text	Identity Data	Rooms			D				
		Room Classification	OmniClass Table 13 Spaces by function	X	X	Yes	NO	Ins	Text	Identity Data	Rooms	13-xx xx xx Fx. example is made for elevator shaft		D				
		Level	Room level location	X	X	Yes	YES				Rooms	B1 for Basement 1 01 for 2nd Floor etc.		D				
		Building	Location of room in the building (Building Number and Building part)	X	X	Yes	NO	Ins	Text	Identity Data	Rooms	0001 00 = Building number 01 = Building part		D				
		Heated	Heated: True False	X	X	Yes	NO	Ins	Yes / No	Other	Rooms			D				
		Area	Net area with reference to DS/EN 15221-6, method 5.10 (Net Room Area)	X	X	Yes	YES				Rooms	m2		D				
		Volume	Net volume belonging to Net area with reference to DS/EN 15221-6, method 5.10 (Net Room Area)	X	X	Yes	YES				Rooms	m3		D				
		Construction Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D				
		Unbounded Height	Net height in the room (ceiling height)	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D				
		Area Type	Area type – with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common area, Shop		L				
		Security Level	Security Level – with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L
		Commissioning Area	In relation to the sound condition of the room/flat after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	(True don't and not commercial) for the decimal separation		D				

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buthbars and switchgears/boards	X	X	Yes
Underground installations	If installations is underground	X	X	Yes
System Type (*Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table*)	System code plus name for technical installation, must be unique to the system	X	X	Yes

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

Take Off

Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design: Schematic Design	Conceptual Design: Design Proposal	Detailed Design: Preliminary Design	Detailed Design: Execution Design	Construction: Project Execution	Operation: Handing over to Operation
Property	Project Information	Building Number	Building number - according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	0047	D					
		Property BBR	BBR Property number. Only used in Denish projects	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Owner	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	008820		D				
		Land area	Area (decimal) - Whole property measured in m2	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	PL, NO, DK, CH and DE		D				
		Municipality	Municipality - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Planned handover date to UHC	X	X	No	NO	Ins	Text	Identity Data	Project Information	DD.MM.YYYY (ex: 14.03.2024)		D				
Spaces	Rooms	Number	Room number - with reference to: Country, Building and Part, Level and Serial Number: For basements: B1, B2, etc. For mezzanine: M1, M2, M etc.	X	X	Yes	YES				Rooms	Format: XX-XXXX-XX-XXX PL = Country code 00 - Building number 0 = Building part 0 = Floor level 0 = Serial number of the room		D					
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Staircase etc.		D					
		Name Local	Alternative room name eg. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D					
		Room Use/Function	Other classification of spaces by function	X	X	No	NO	Ins	Text	Identity Data	Rooms	Shaft This example is made for elevator shaft		D					
		Level	Room level location	X	X	Yes	YES				Rooms	B1 for Basement 1 01 for 2nd Floor		D					
		Building	Location of room in the building: Building number and Building part		X	No	NO	Ins	Text	Identity Data	Rooms	000 00 - Building number 0 - Building part		D					
		Heated	Heated: True/False		X	No	NO	Ins	Yes/No	Other	Rooms			D					
		Area	Net area - with reference to DGBI NS3-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	7.0		D					
		Volume	Net volume belonging to the area with reference to DGBI NS3-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	7.00		D					
		Construction Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D					
		Unsuspended Height	Net height in the room (ceiling height)	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D					
		Area Type	Area type - with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Technical		L					
		Security Level	Security Level - with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L	
		Commissioning Area	In relation to the sound condition of the room. Filled after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	(Rule: don't use "." and not comma ",", for the decimal separation)		D					

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buthbars and switchgears/boards	X	X	Yes
Underground Installations	If installations is underground	X	X	Yes
System Type (*Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table*)	System code plus name for technical installation, must be unique to the system	X	X	Yes

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design: Schematic Design	Conceptual Design: Design Proposal	Detailed Design: Preliminary Design	Detailed Design: Execution Design	Construction: Project Execution	Operation: Handing over to Operation
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		Property BBR	BBR Property number. Only used in Denish projects	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Owner	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	000020		D				
		Land area	Area calculation - Whole property measured in m2	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	FI, NO, DK, CH and DE		D				
		Function	Function - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Preliminary handover date to UHC	X	X	No	NO	Ins	Text	Identity Data	Project Information	[Country]-[Year/Month/Day]-[Location]-[Building number]-[Building part]-[Floor level]-[Serial number of the room]		D				
Spaces	Rooms	Number	Room number - with reference to: Country,Building and Part Level and Serial Number For basements: B1, B2, B3 etc. For mezzanine: M1, M2, M etc.	X	X	Yes	YES				Rooms	FI = Country code 00 = Building number 01 = Building part 1 = Floor level 01 = Serial number of the room		D				
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Stairwell etc.		D				
		Name Local	Alternative room name eg. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D				
		Room Classification	OMNIClass Table 13 Spaces by Function	X	X	No	NO	Ins	Text	Identity Data	Rooms	23xx This example is made for elevator shaft		D				
		Level	Room level location	X	X	Yes	YES				Rooms	B1 for Basement 1 01 for 2nd Floor		D				
		Building	Location of room in the building: Building number and Building part		X	No	NO	Ins	Text	Identity Data	Rooms	0100 00 = Building number 01 = Building part		D				
		Finished	Finished True False		X	No	NO	Ins	Yes/No	Other	Rooms			D				
		Area	Net area - with reference to DGBC NTA-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	110		D				
		Volume	Net volume according to Net area - with reference to DGBC NTA-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	330		D				
		Construction Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D				
		Unobstructed Height	Net height in the room (ceiling height)	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D				
		Area Type	Area type - with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Shop		L				
		Security Level	Security Level - with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L
		Commissioning	In relation to the sound condition of the rooms. Filed after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	(True, False) and not commercial for the decimal separation		D				

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	**Yes**
Capacity of AHU	m3/h for each AHU	X	X	**Yes**
Ampere	For bushbars and switchgears/boards	X	X	**Yes**
Underground installations	If installations is underground	X	X	**Yes**
System Type *(Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table)*	System code plus name for technical installations, must be unique to the system	X	X	**Yes**

Custom Parameters needed for Take Off

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

Examples

Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design		Detailed Design		Construction	Operation
													Schematic Design	Design Proposal	Preliminary Design	Execution Design	Project Execution	Handing over to Operation
Property	Project Information	Building Number	Building number - according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	30-40	D					
		Property BBID	BBP Property number. Only used in Demon projects	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender, Detailed Design	D					
		Land Owner	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	BBSD		D				
		Land area	Area calculation - Whole property measured in m2	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	HU, MK, DK, CH and CZ		D				
		Function	Function - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Preliminary handover date to UHC	X	X	No	NO	Ins	Text	Identity Data	Project Information	Schedule (Year-Month-Day).		D				
Spaces	Rooms	Number	Room number - with reference to Country, Building and Part, Level and Serial number. For basements -01, -02, etc. For mezzanine M1, M2, M - etc.	X	X	Yes	YES				Rooms	HU-300101 HU – Country code 30 – Building number 0 – Building part 1 – Floor level 01 – Serial number of the room		D				
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Staircase etc.		D				
		Name Local	Alternative room name e.g. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D				
		Room Classification	UNIClass Tables 5 Spaces by function	X	X	No	NO	Ins	Text	Identity Data	Rooms	UNICLASS This example is made for elevator shaft		D				
		Level	Room level location	X	X	Yes	YES				Rooms	00 for Basement 2 01 for 2nd Floor		D				
		Building	Location of room in the building. Building number and Building part		X	No	NO	Ins	Text	Identity Data	Rooms	300 30 – Building number 0 – Building part		D				
		Finished	Finished True False		X	No	NO	Ins	Yes/No	Other	Rooms			D				
		Area	Net area - with reference to DGBI NRM-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	m2		D				
		Volume	Net volume according to Net area - with reference to DGBI NRM-6 method 5.0 (Net Room Area)	X	X	Yes	YES				Rooms	100		D				
		Construction Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D				
		Unobstructed Height	Net height in the room ceiling height	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D				
		Area Type	Area type - with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Shop		L				
		Security Level	Security Level - with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L
		Commissioning	In relation to the sound condition of the rooms. Fixed after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	15 (use dot (.) and not comma (,) for the decimal separation		D				

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buchbeers and switchgears/boards	X	X	Yes
Underground Installations	If installations is underground	X	X	Yes
System Type *(Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table)*	System code plus name for technical installation, must be unique to the system	X	X	Yes

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design: Schematic Design	Conceptual Design: Design Proposal	Detailed Design: Preliminary Design	Detailed Design: Execution Design	Construction: Project Execution	Operation: Handing over to Operation
Property	Project Information	Building Number	Building number - according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	0047	D					
		Property BBR	BBR Property number. Only used in Denish projects	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Owner	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	008820		D				
		Land area	Area calculation of the property measured in m2	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	FI, NO, DK, CH and DE		D				
		Municipality	Municipality - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Planned handover date to UHC	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
Spaces	Rooms	Number	Room number - with reference to: Country, Building and Part Level and Serial Number: For basements: B1, B2 etc. For mezzanine: M1, M2, M etc.	X	X	Yes	YES				Rooms	Example: (see Uniformat Class) Format: FC – Country code BB – Building number P – Building part L – Floor level S – Serial number of the room		D					
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Stairwell etc.		D					
		Name Local	Alternative room name eg. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D					
		Space Classification	UNIFORMAT Level 3 Spaces by function	X	X	No	NO	Ins	Text	Identity Data	Rooms	Shaft Technical space This example is made for elevator shaft		D					
		Level	Room level location	X	X	Yes	YES				Rooms	B1 for Basement 1 01 for 2nd Floor etc.		D					
		Building	Location of room in the building. Building number and Building part		X	No	NO	Ins	Text		Rooms	000 BB – Building number P – Building part		D					
		Habitable	Habitable: True, False		X	No	NO	Ins	Yes / No	Other	Rooms			D					
		Area	Net area - with reference to DGBN NS3940 & method 5.10 Net Room Area	X	X	Yes	YES				Rooms	m2		D					
		Volume	Net volume belonging to Net area - with reference to DGBN NS3940 & method 5.10 Net Room Area	X	X	Yes	YES				Rooms	m3		D					
		Combustible Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D					
		Unsuspended Height	Net height in the room ceiling height	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D					
		Area Type	Area type - with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Technical		L					
		Security Level	Security Level - with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L	
		Commissioning	In relation to the sound condition of the rooms. Filled after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	True, False, and not applicable for the decimal separator		D					

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buthbars and switchgears/boards	X	X	Yes
Underground Installations	If installations is underground	X	X	Yes
System Type (*Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table*)	System code plus name for technical installation, must be unique to the system	X	X	Yes

Who delivers

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

When and how much

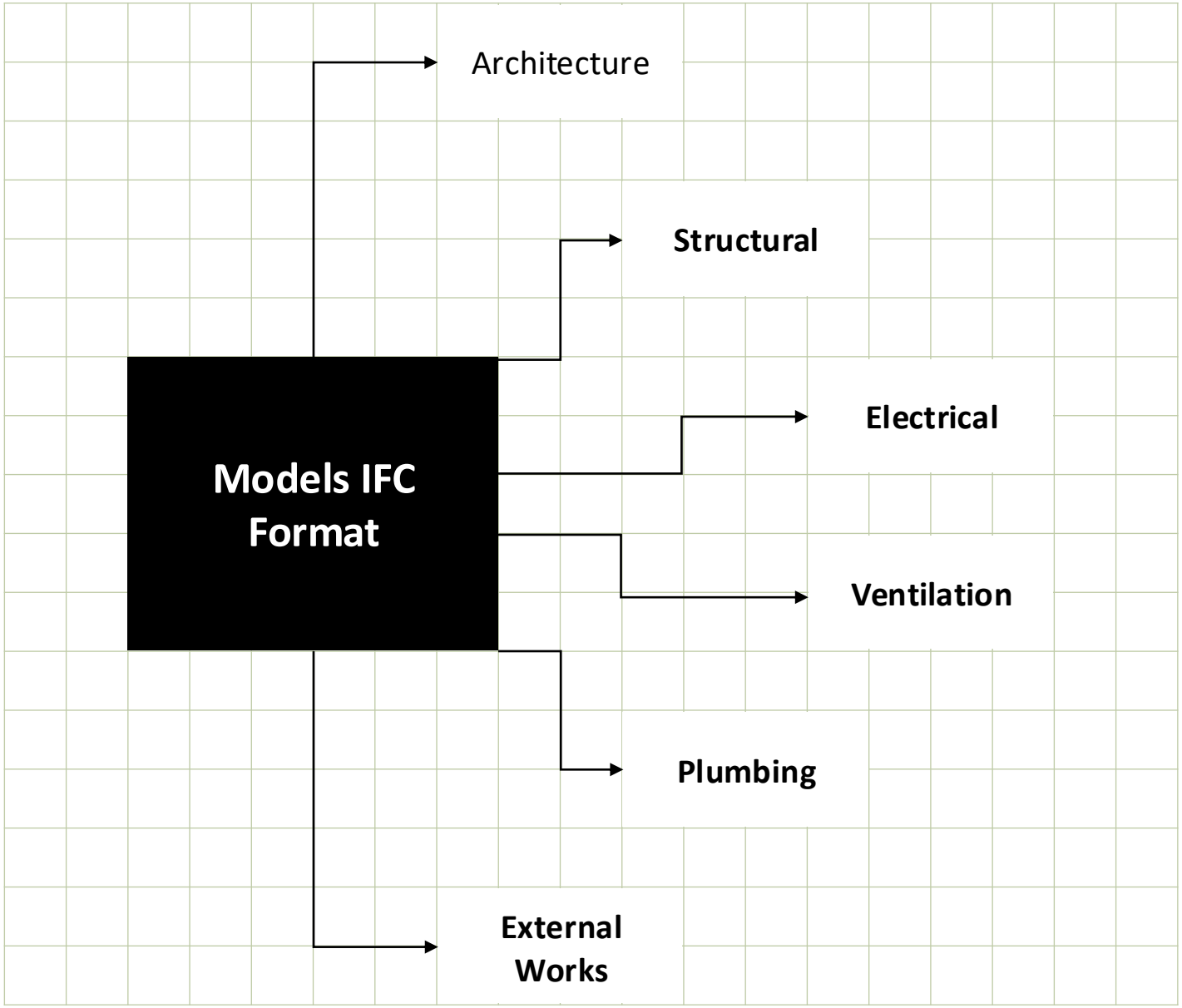
Object Type:	Sub-group	Property Data field	Property Data	LOI for Tender	LOI for O&M	Required for QTO	Revit Standard parameter	Parameter Type	Revit Data Type	Revit Parameter group	Revit Category	Examples	Conceptual Design: Schematic Design	Conceptual Design: Design Proposal	Detailed Design: Preliminary Design	Detailed Design: Execution Design	Construction: Project Execution	Operation: Handing over to Operation
Property	Project Information	Building Number	Building number - according to Client Standard	X	X	Yes	NO	Ins	Text	Identity Data	Project Information	0047	D					
		Property BBR	BBR Property number. Only used in Denish projects	X	X	No	NO	Ins	Text	Identity Data	Project Information		D	D				
		Property Name	Designation of property	X	X	No	YES				Project Information		D					
		Project Address	Project Address	X	X	No	YES				Project Information		D					
		Project Status	Which phase is the 3D model related to	X	X	Yes	YES				Project Information	Tender / Detailed Design	D					
		Land Owner	Land Parcel and building owner association	X	X	No	NO	Ins	Text	Identity Data	Project Information	008820		D				
		Land area	Area cadastre - Whole property measured in m2	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Country Code	Country code - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information	FI, NO, SE, DK and DE		D				
		Municipality	Municipality - with reference to Client Standard	X	X	No	NO	Ins	Text	Identity Data	Project Information			D				
		Handover Date	Preliminary handover date to UHC	X	X	No	NO	Ins	Text	Identity Data	Project Information	Example: dd-MM-YYYY 01-01-2027		D				
Spaces	Rooms	Number	Room number - with reference to: Country, Building and Part, Level and Serial Number: For basements: B1, B2, B3 etc. For mezzanine: M1, M2, M etc.	X	X	Yes	YES				Rooms	FI = Country code 00 = Building number 01 = Building part 1 = Floor level 01 = Serial number of the room		D					
		Name	Room description	X	X	Yes	YES				Rooms	Elevator shaft Staircase etc.		D					
		Name Local	Alternative room name eg. in local language	X	X	No	NO	Ins	Text	Identity Data	Rooms			D					
		Room Classification	OmniClass Table 13 Spaces by function	X	X	No	NO	Ins	Text	Identity Data	Rooms	13-xx xx xx This example is made for elevator shaft		D					
		Level	Room level location	X	X	Yes	YES				Rooms	B1 for Basement 1 01 for 2nd Floor etc.		D					
		Building	Location of room in the building. Building number and Building part		X	No	NO	Ins	Text	Identity Data	Rooms	00 = Building number 01 = Building part		D					
		Finished	Finished True False		X	No	NO	Ins	Yes/No	Other	Rooms			D					
		Area	Net area - with reference to DGBimNS-6 method 5.7.0 (Net Room Area)	X	X	Yes	YES				Rooms	m2		D					
		Volume	Net volume belonging to Net area - with reference to DGBimNS-6 method 5.7.0 (Net Room Area)	X	X	Yes	YES				Rooms	m3		D					
		Construction Height	Height of the room	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the bottom surface of the upper floor slab		D					
		Unsuspended Height	Net height in the room ceiling height	X	X	Yes	YES				Rooms	The distance between the top surface of the floor slab and the suspended ceiling		D					
		Area Type	Area type - with reference to client Policy		X	Yes	NO	Ins	Text	Identity Data	Rooms	Production, Office, Storage, Common Area, Technical		L					
		Security Level	Security Level - with reference to Client Standard		X	No	NO	Ins	Text	Identity Data	Rooms							L	
		Commissioning	In relation to the sound condition of the rooms. Filled after the construction is finished		X	No	NO	Ins	Text	Identity Data	Rooms	(True, False) and not commonly for the decimal separator		D					

Pipe/duct insulation hosts size	Size of the duct/pipe that is hosting the insulation	X	X	Yes
Capacity of AHU	m3/h for each AHU	X	X	Yes
Ampere	For buthbars and switchgears/boards	X	X	Yes
Underground installations	If installations is underground	X	X	Yes
System Type (*Some revit categories do not have a revit standard parameter e.g. Cable trays and Lighting. For elements where there are no standard parameter create this new parameter according to the specifications in this table*)	System code plus name for technical installation, must be unique to the system	X	X	Yes

Responsibility for completing of data	Signature
Designer	D
Contactor	C
Client	L

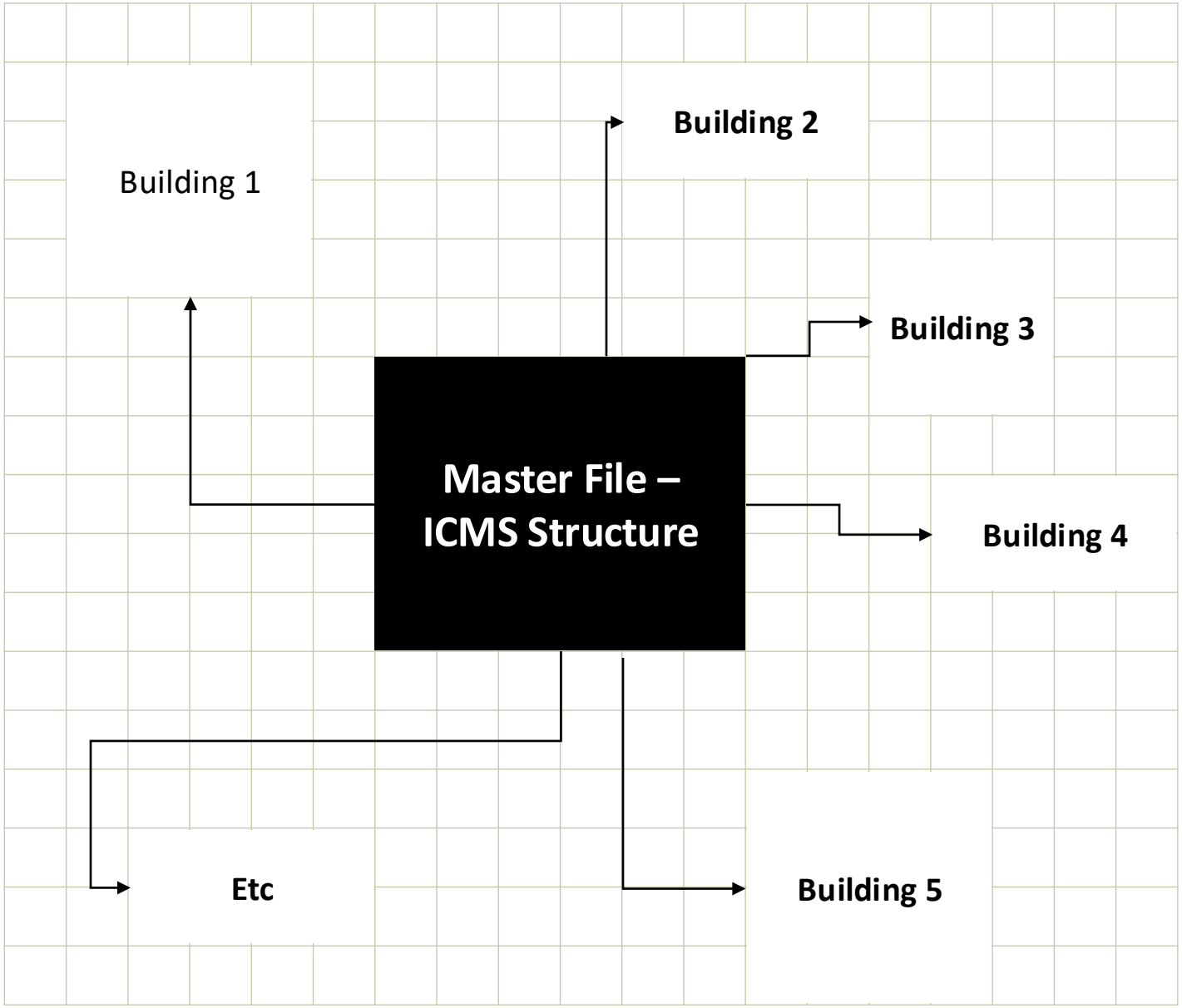
The Challenge

Using location separation we divided the models into more than 6 different discipline working models.

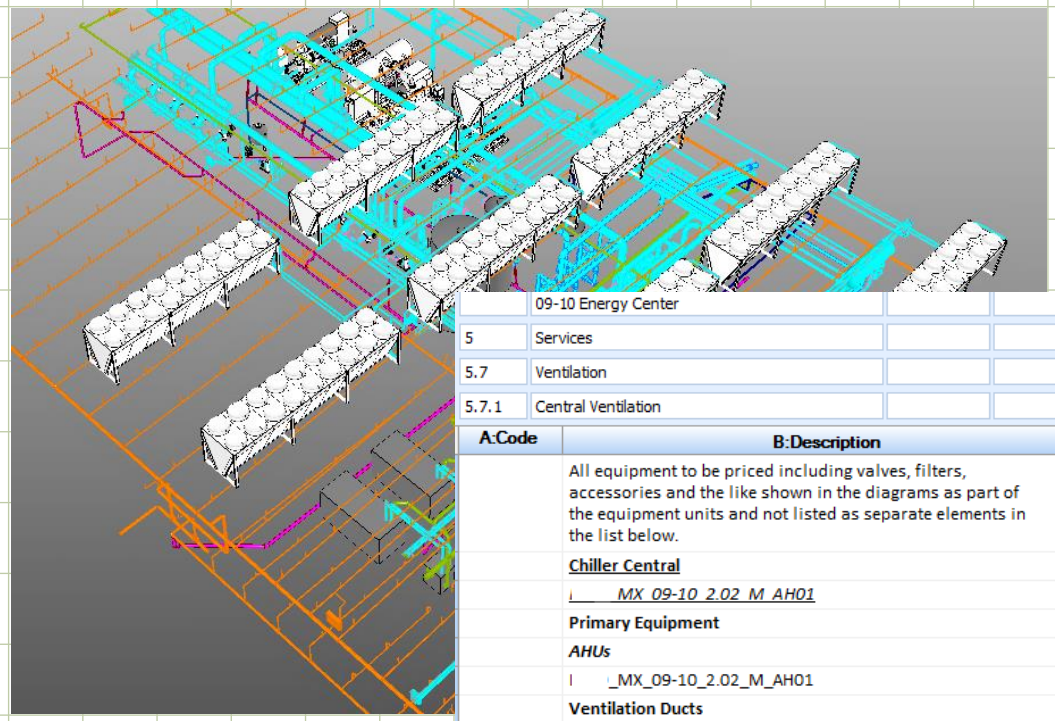


The Challenge

How we used a master file process with estimating software and split into 26 buildings



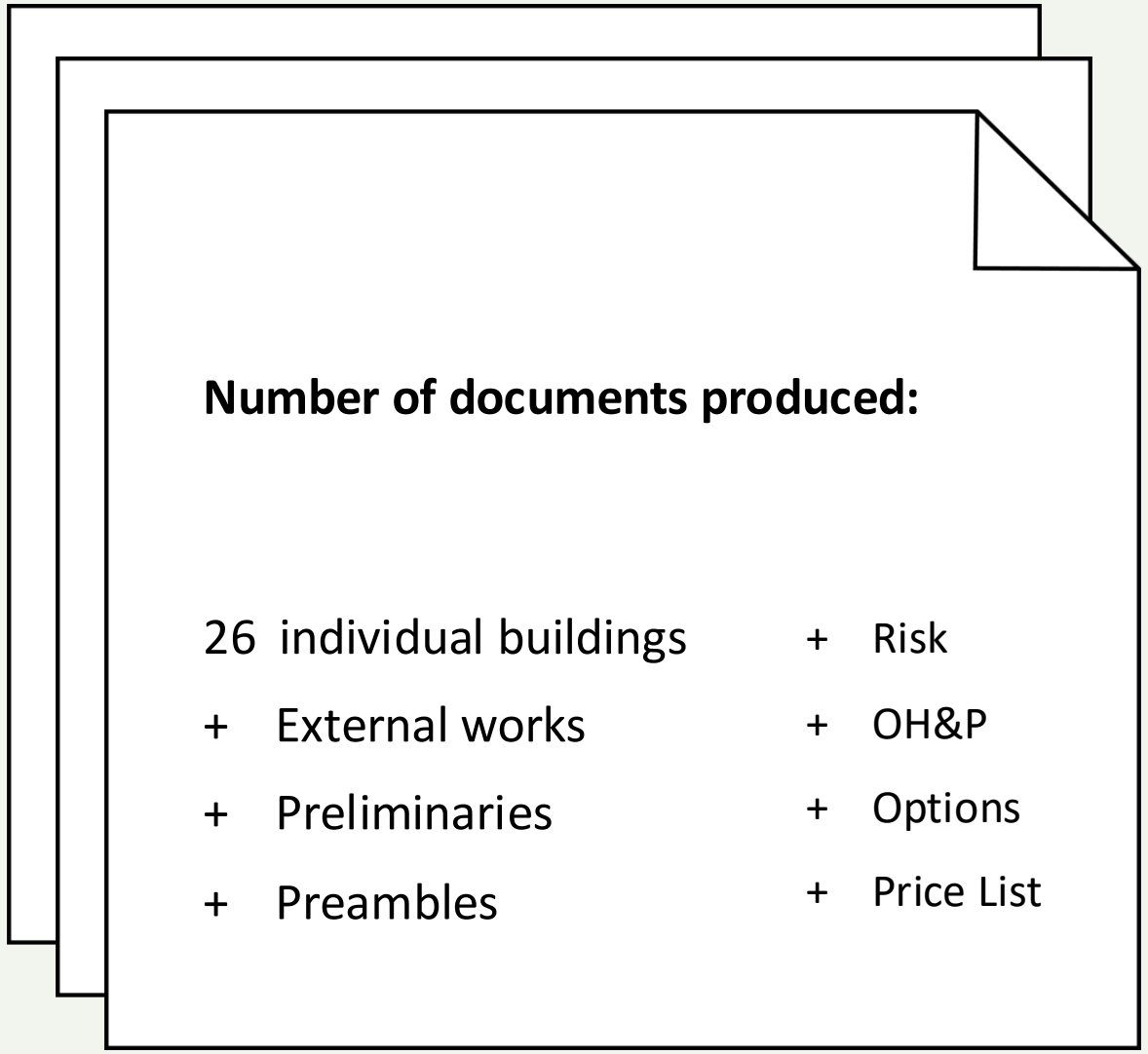
Each model was mapped to the Master File – ICMS Structure:



	09-10 Energy Center				
5	Services				
5.7	Ventilation				
5.7.1	Central Ventilation				

A:Code	B:Description	C:Quantity	D:Unit
	All equipment to be priced including valves, filters, accessories and the like shown in the diagrams as part of the equipment units and not listed as separate elements in the list below.		
	Chiller Central		
	MX_09-10_2.02_M_AH01		
	Primary Equipment		
	AHUs		
	_MX_09-10_2.02_M_AH01	1	no
	Ventilation Ducts		
	Rectangular		
	Ducts		
	5712001_Rectangular_Duct (750x300)	46	m
	5712001_Rectangular_Duct (750x750)	118	m
	5712001_Rectangular_Duct (1545x855)	0.2	m
	5712001_Rectangular_Duct (1545x1160)	0.2	m
	Ducts Fittings		
	5712002_Duct_Rect_Bend (300x750-300x750)	10	no
	5712002_Duct_Rect_Bend (750x750-750x750)	10	no
	5712009_Duct_Rect_Tap (750x300-750x300)	10	no
	5712010_Duct_Rect_Reducer (800x800-750x750)	1	no
	5712010_Duct_Rect_Reducer (1545x855-750x750)	2	no
	5712010_Duct_Rect_Reducer (1545x1160-750x750)	2	no
	Duct ancillaries		
	Shapes		

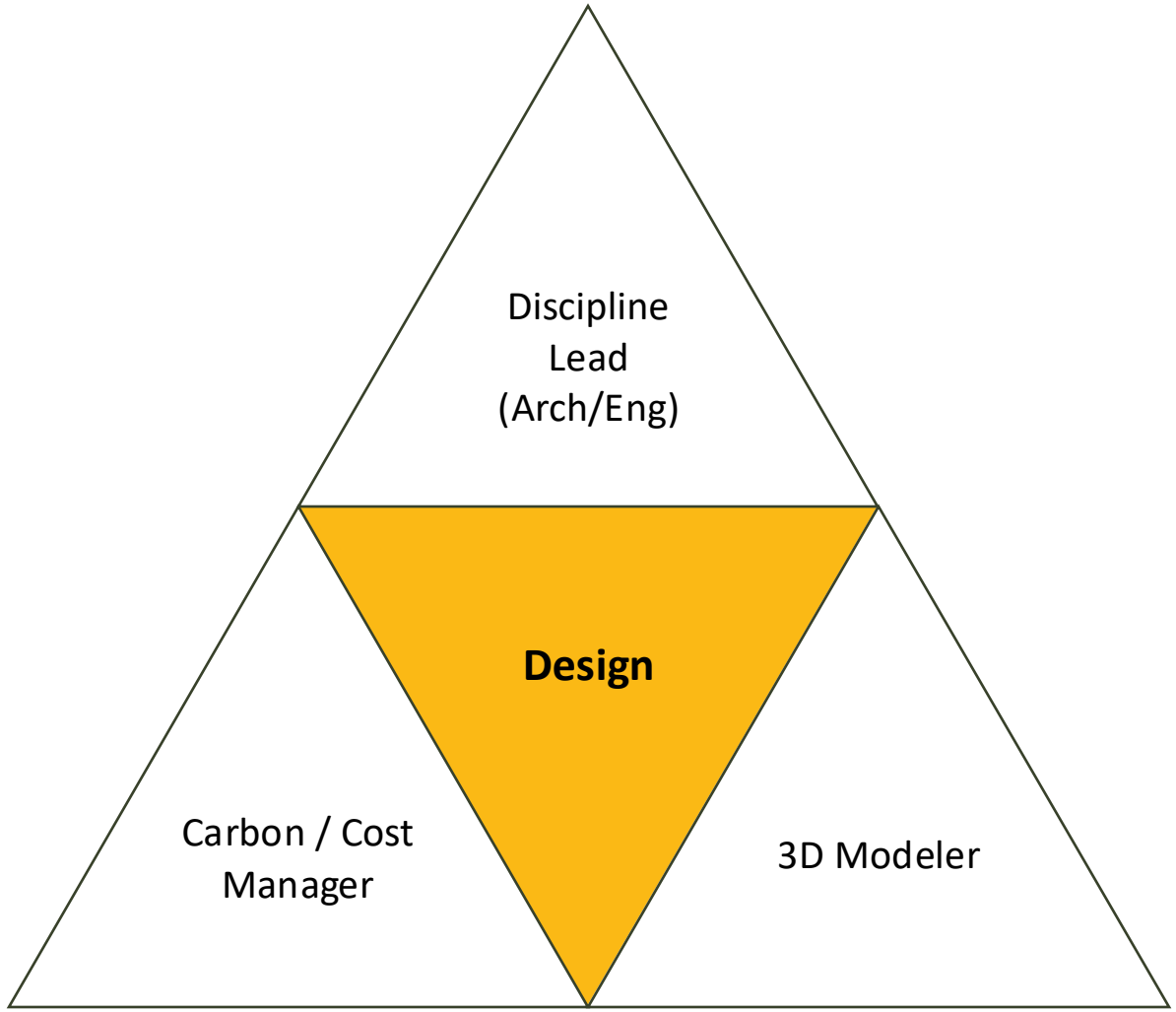
Commercial Management Strategy



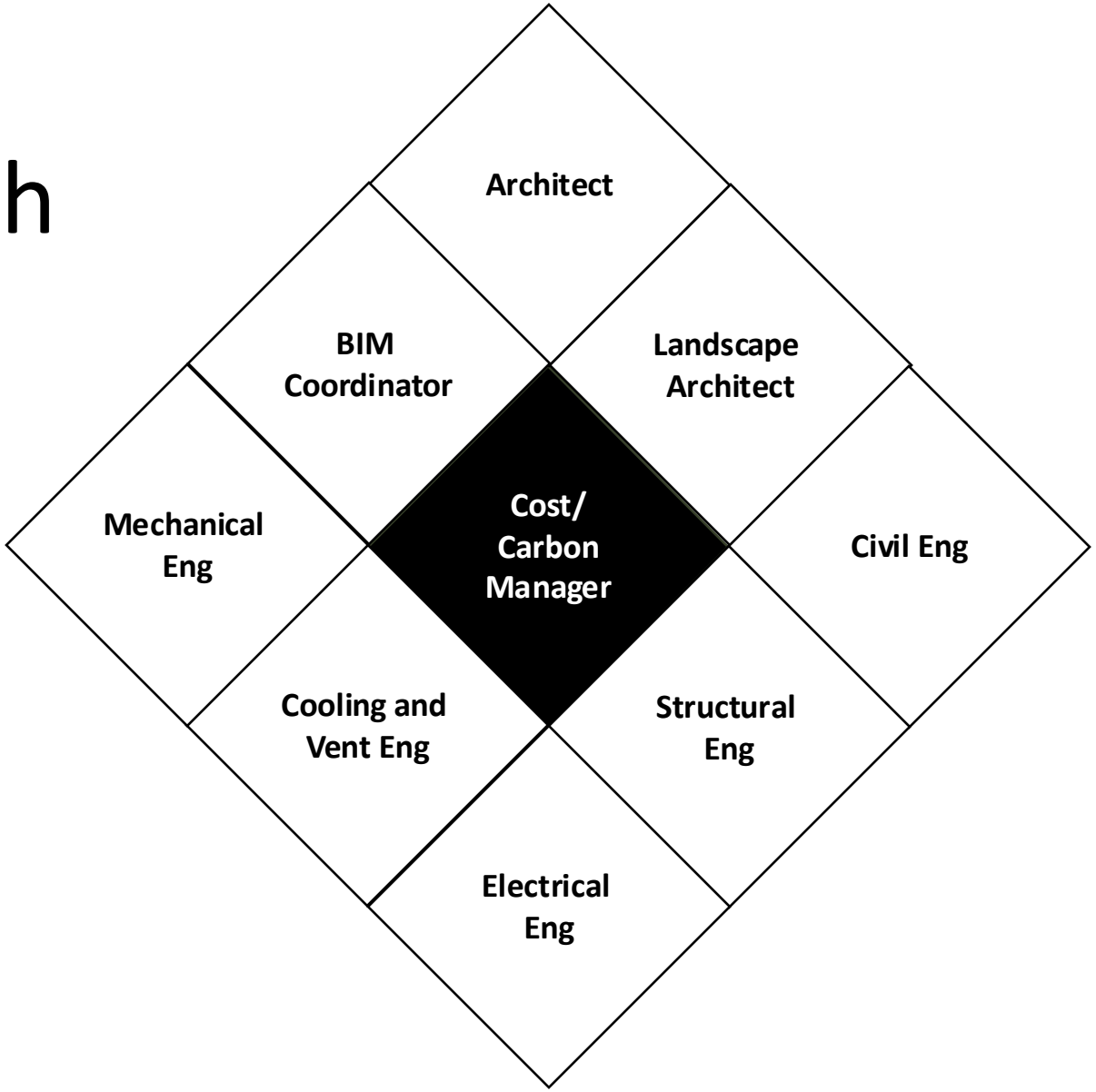
The Integrated Process

Let’s all Design Together

BIM is forcing integrated design (project) delivery, where the QS/Cost Manager and the design team <u>design together</u>

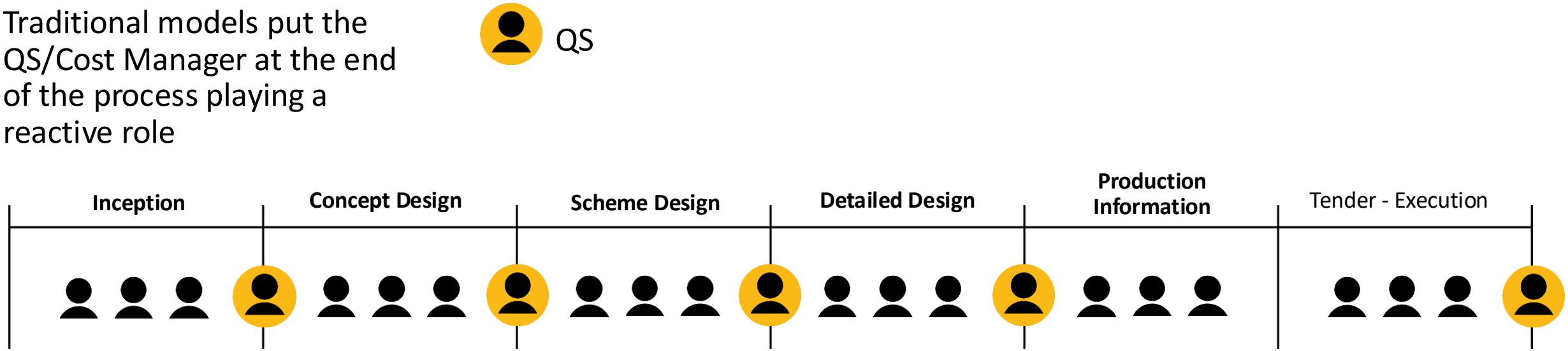


Integrated Approach



Integrated Approach

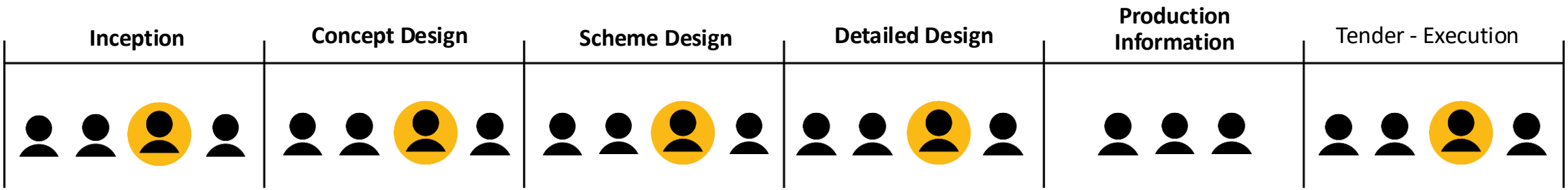
Traditional models put the QS/Cost Manager at the end of the process playing a reactive role



Integrated Approach

Traditional models put the QS/Cost Manager at the end of the process playing a reactive role

QS

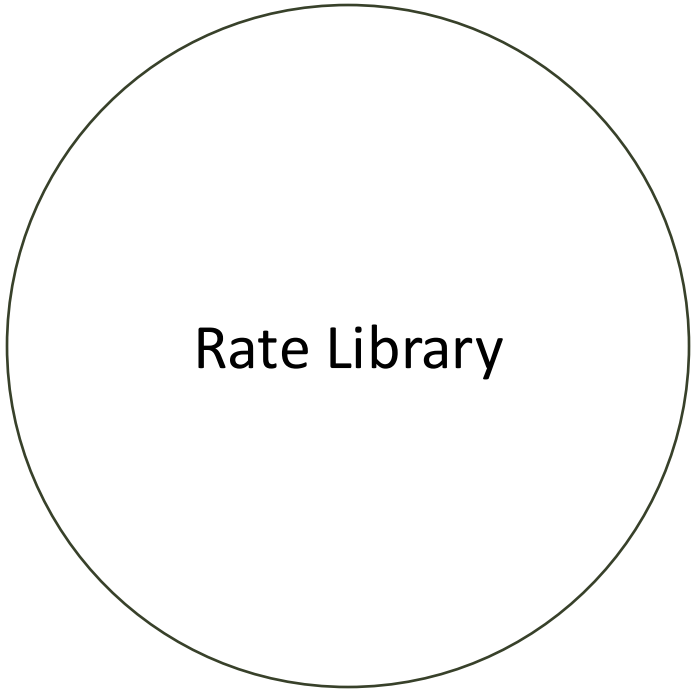


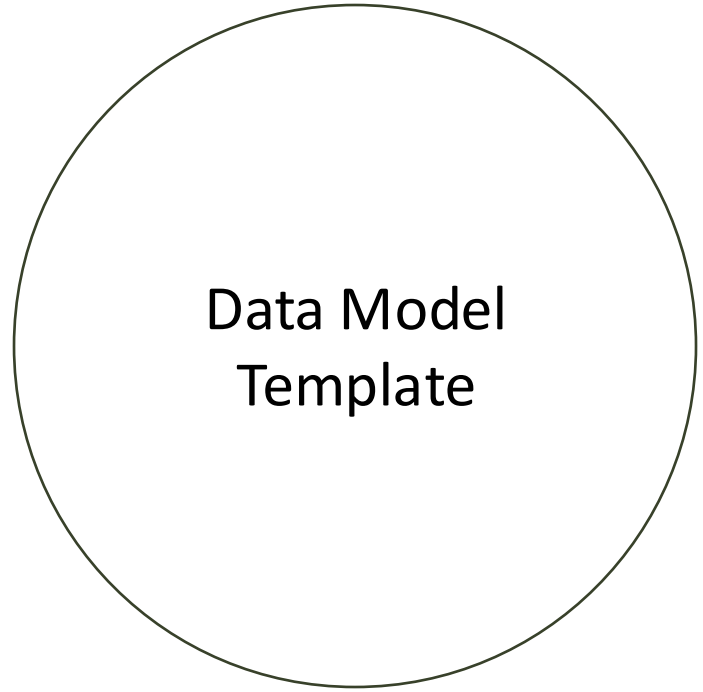
Data Management

How we focused on Data rather than estimating

How we structured information in the Estimating Software and the estimating process.

Standardised cost structure for the project developing the level of detail per phase – ICMS



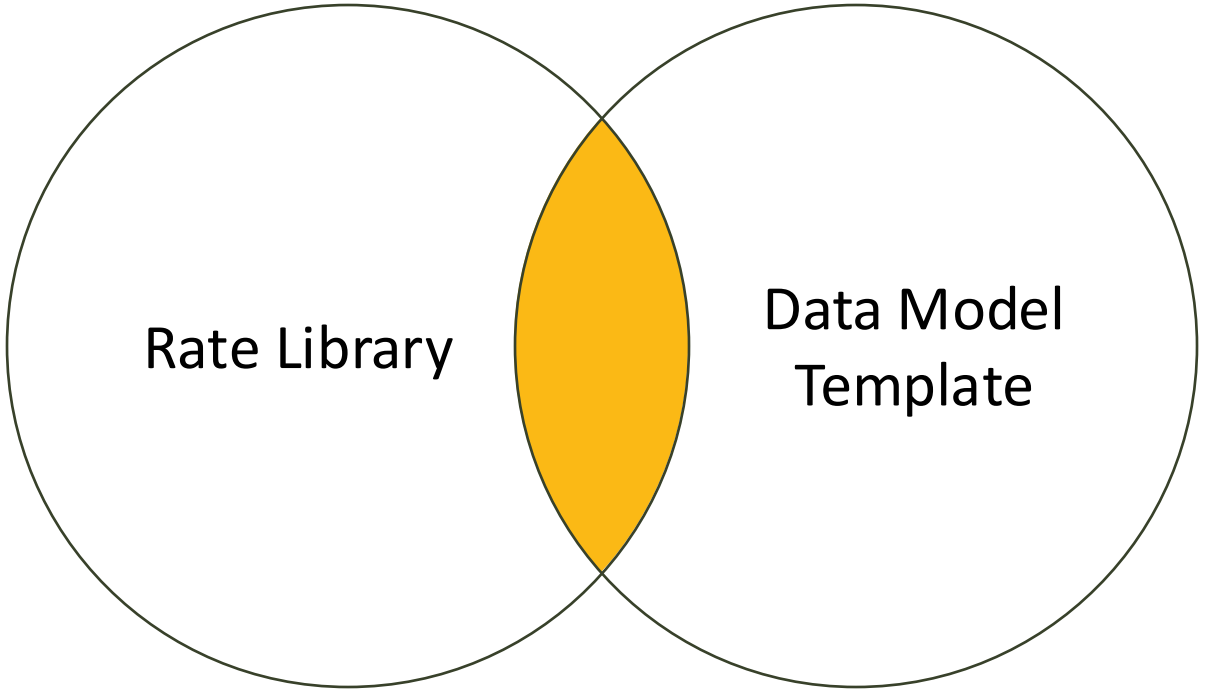


Data Management

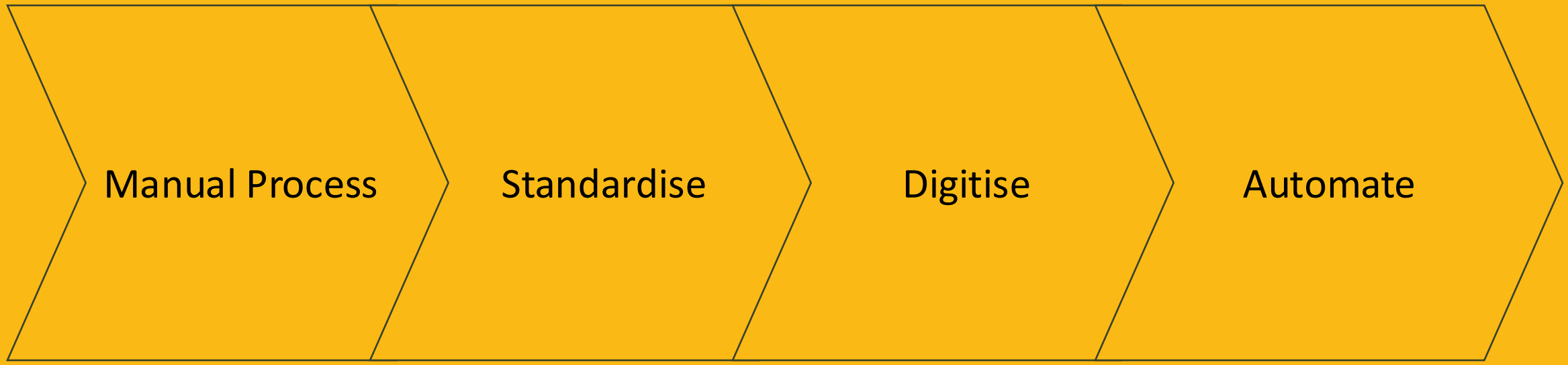
How we focused on Data rather than estimating

How we structured information in the Estimating Software and the estimating process.

Standardised cost structure for the project developing the level of detail per phase – ICMS.



The Result


Manual Process
Standardise
Digitise
Automate

Result

Number of pricable items

6.000

Versus **120.000**

Number of documents

26+

Nr of QS people (resources)

5

Models to be processed

156+nr

Time for updates

2 weeks

Commercial Management Strategy

KOSMOS approach, 4 weeks for estimate and BOQ production

With 4-5 Cost Managers/Specialists

Concept
2 weeks

Schematic
3 weeks

Detailed Design
4 weeks

Commercial Management Strategy

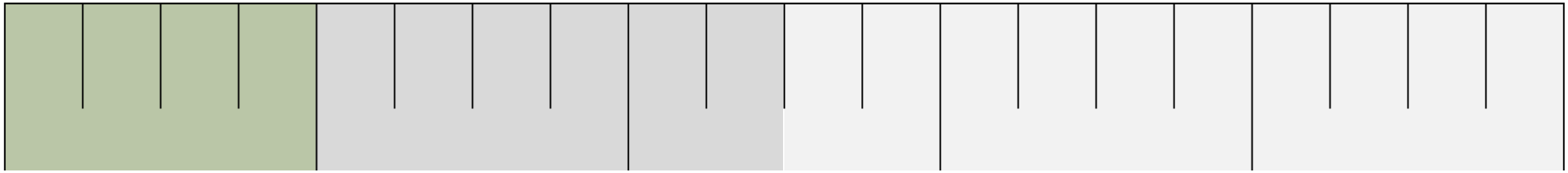
Traditional Approach 18-20 weeks for estimate and BOQ production

With 8-12 Cost Managers/Specialists

Concept
4 weeks

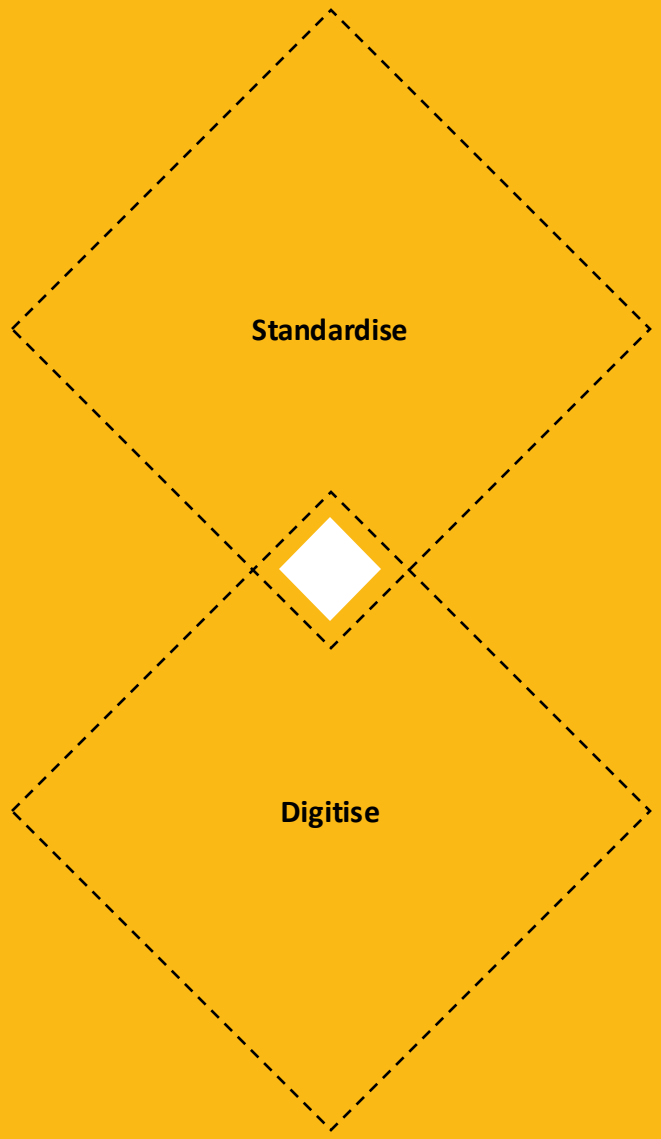
Schematic
6 weeks

Detailed Design
8-10 weeks

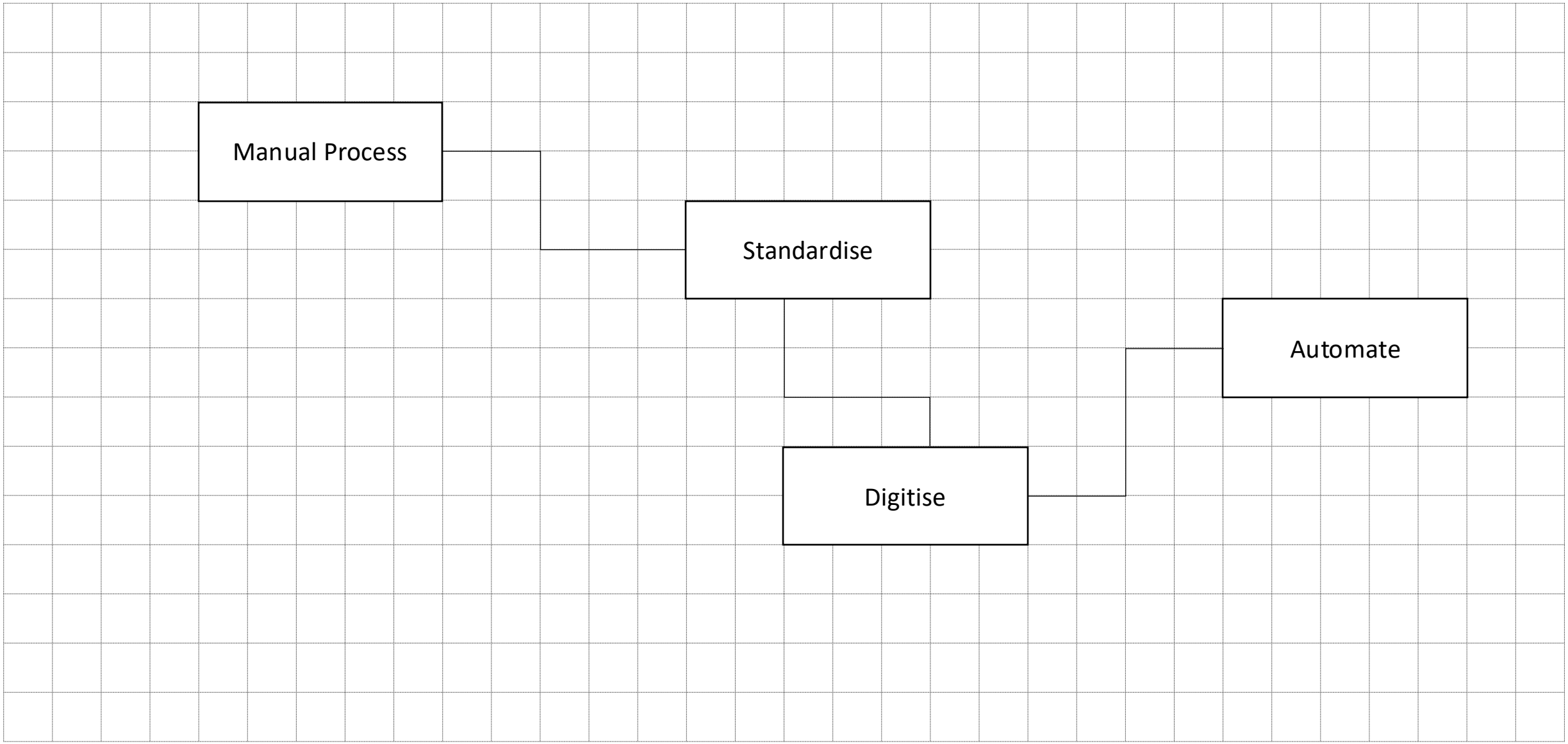


This does not only save time in design and cost but also results in better quality design material

The Data Value

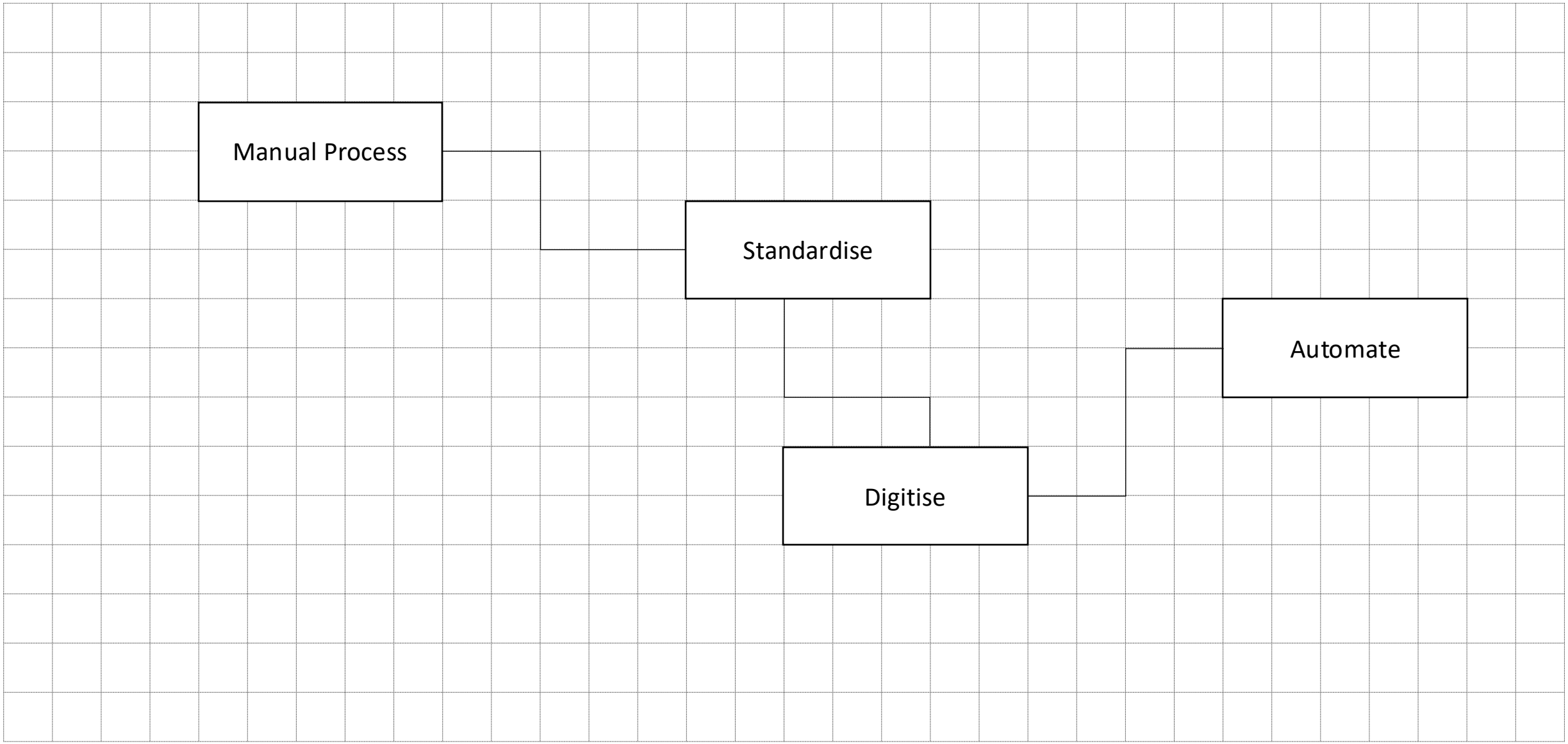


But how do we get there?


Manual Process
Standardise
Digitise
Automate

ICMS – International Cost Management Standard

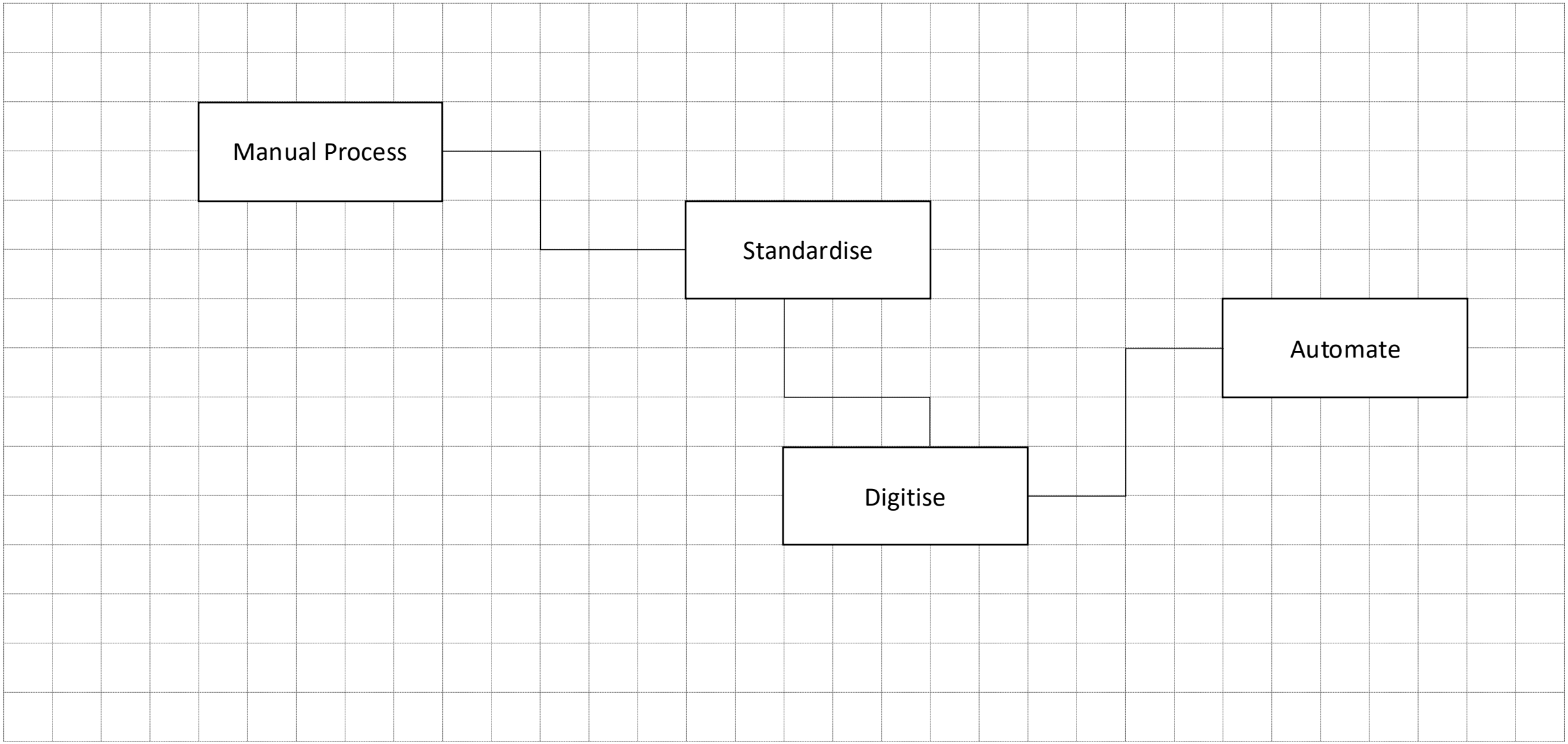
ICMS is used to classify the building elements and extract the quantities into a common work breakdown structure for both cost and carbon.


Manual Process
Standardise
Digitise
Automate

Pricing Database

The 5D is the database and analytics tool we use to capture, track, and share commercial and carbon intelligence throughout the building lifecycle.

All our cost and carbon data, collected from a range of sources (KOSMOS estimates/contractor returns/final accounts), is structured in a format that allows it to be rebased on projects globally for benchmarking and to inform our estimates.


Manual Process
Standardise
Digitise
Automate

Quality

Accuracy

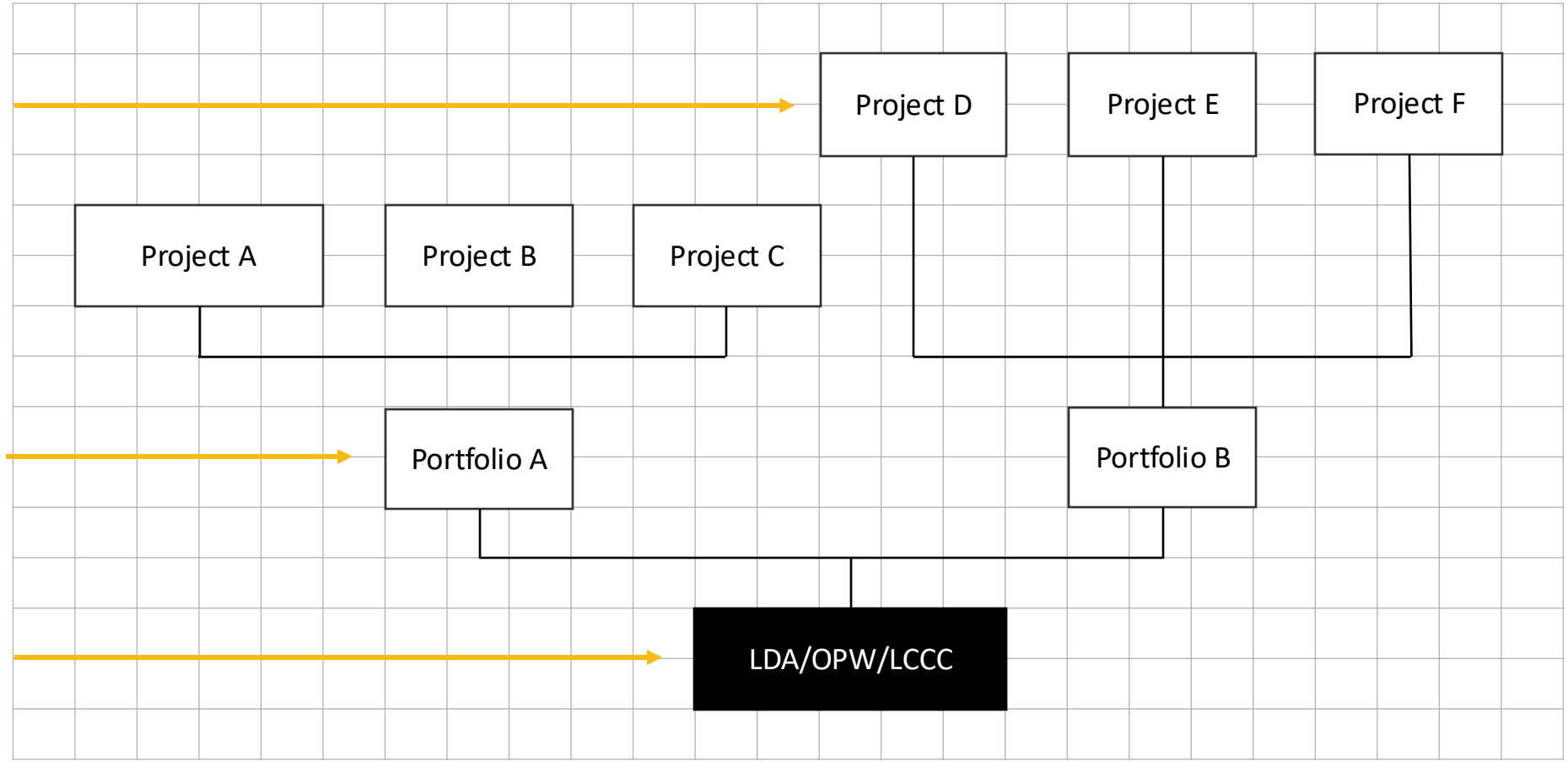
Clarity

Opportunity: Cost & Carbon data

1. Same cost break down structure on all projects (ICMS)

2. Cost information rolled up and collected for future use

3. Cost information collected in central data base for future development decision making (m2 prices, cost per Unit)



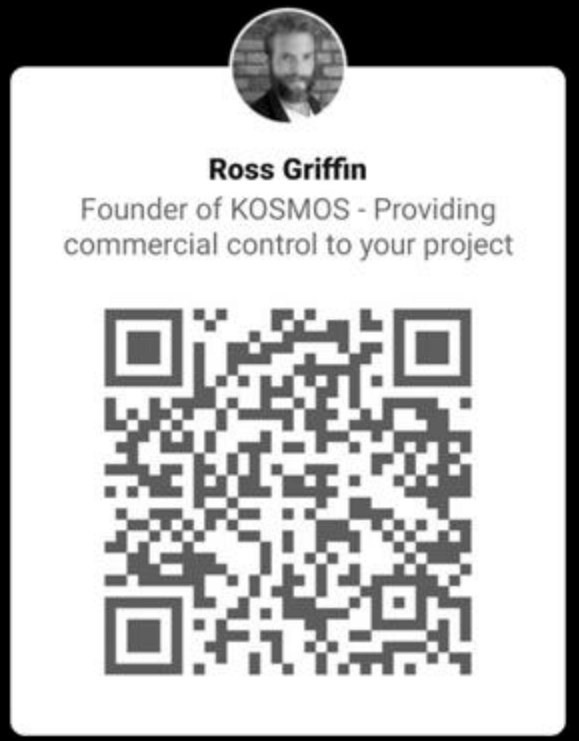
The Conclusion

Conclusion: 5 Takeaways

1. To Leverage data created by another stakeholder you need an integrated collaborative process
2. The Digital QS/Cost Manager needs to be involved from the very beginning
3. Regular communication is key, help each other to succeed in quality data sharing
4. Do not wait until the design is delivered, work parallel with the design to make sure you get what you need
5. The process, structure and value need to be understood from the beginning

Use your network for help and advice. Write to us here in KOSMOS, we are more than happy to help

Save our contact on your phone



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