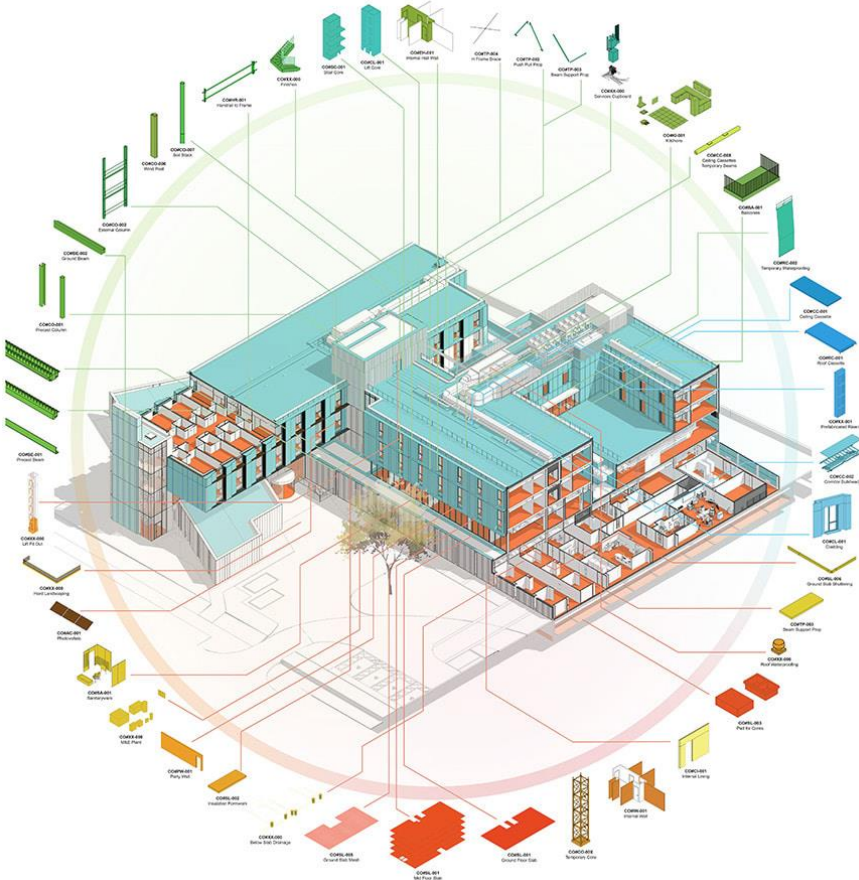


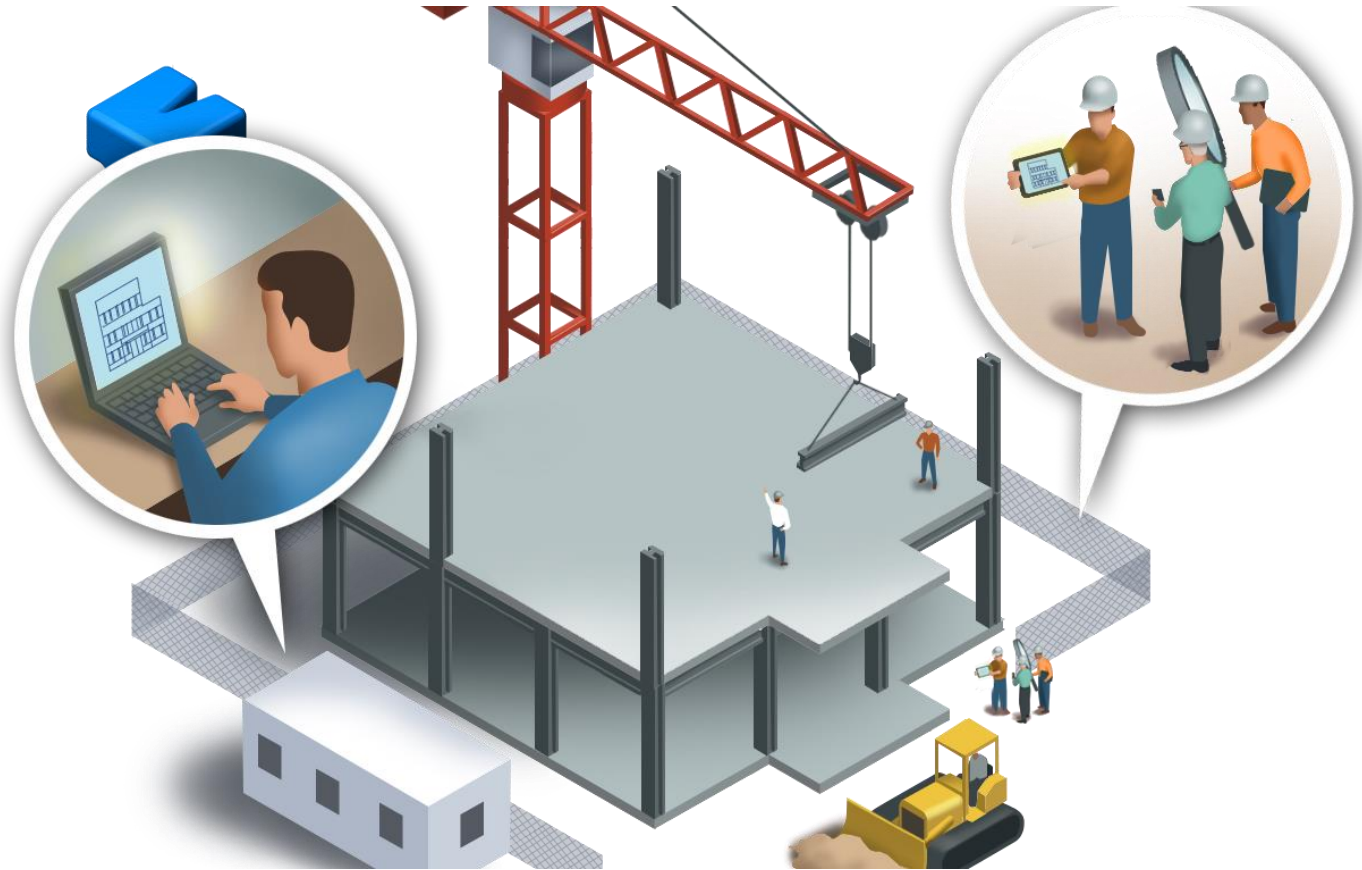
Digital Construction for DFMA



MTECH Engineering Co.,Ltd.

Nov.2019





- MTECH Introduction
- BIM for Building Construction
- Digital Construction for DFMA
- Challenges
- Conclusion

Agenda



Agenda

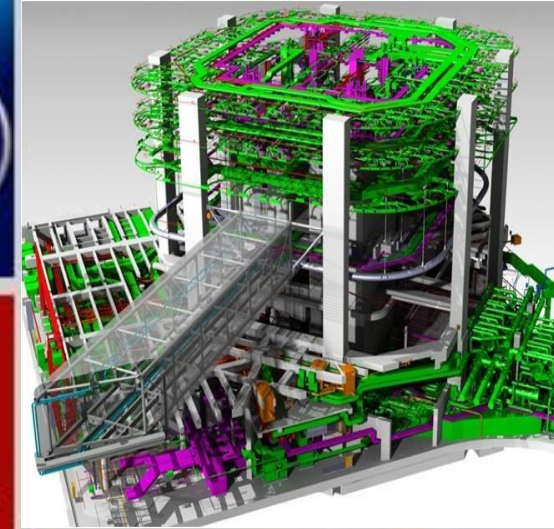
- **MTECH Introduction**
- BIM for Building Construction
- Digital Construction for DFMA
- Challenges
- Conclusion



Mission / Passion

We are applying new technology to change the ways of doing things for better life.
我們利用高新科技改變做事的方式，令我們生活得更好。





MTECH

INNOVATIVE
CONSTRUCTION
TECHNOLOGY

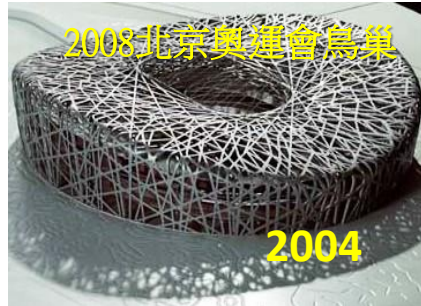
TRENDS IN 2017

23 yrs +



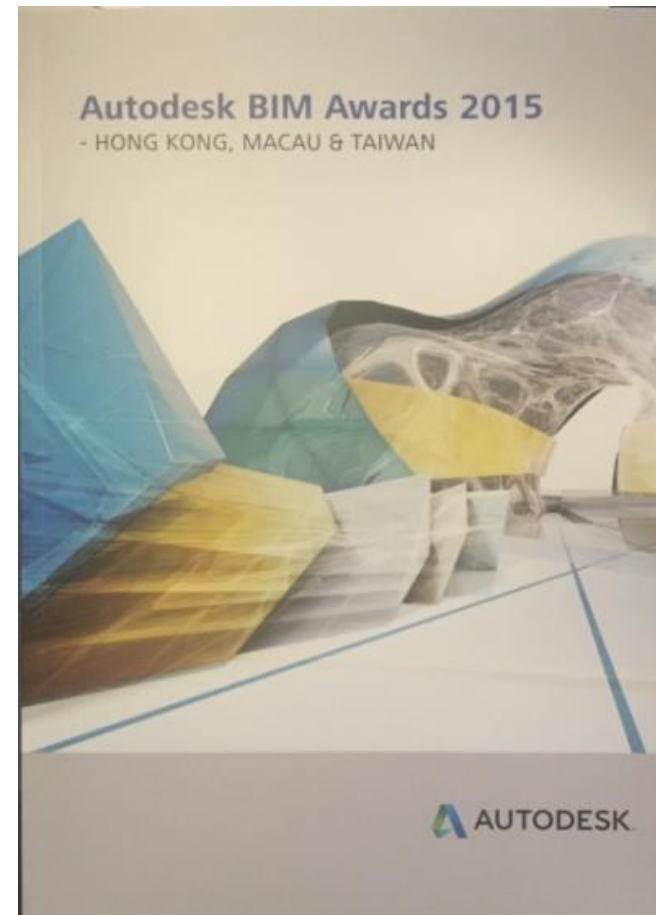


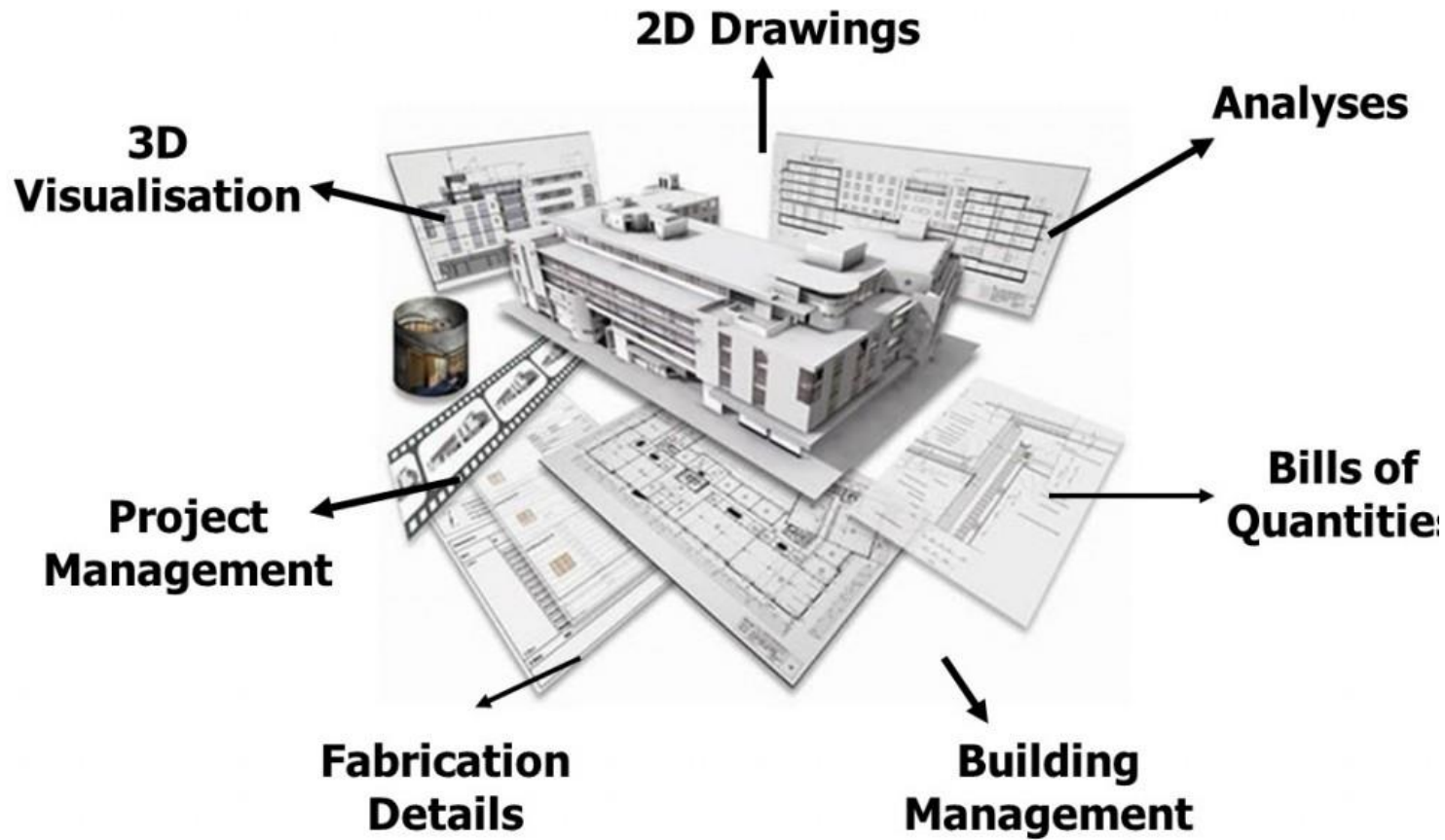
Project Reference





Company Award



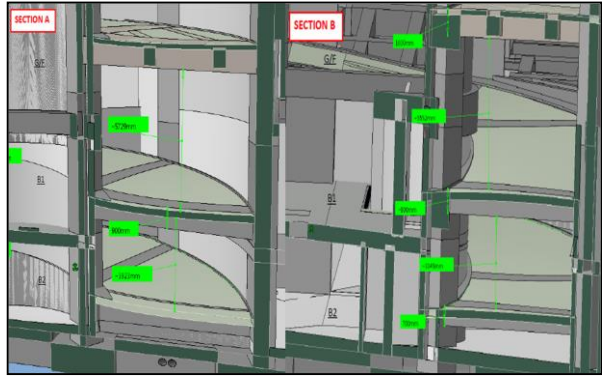
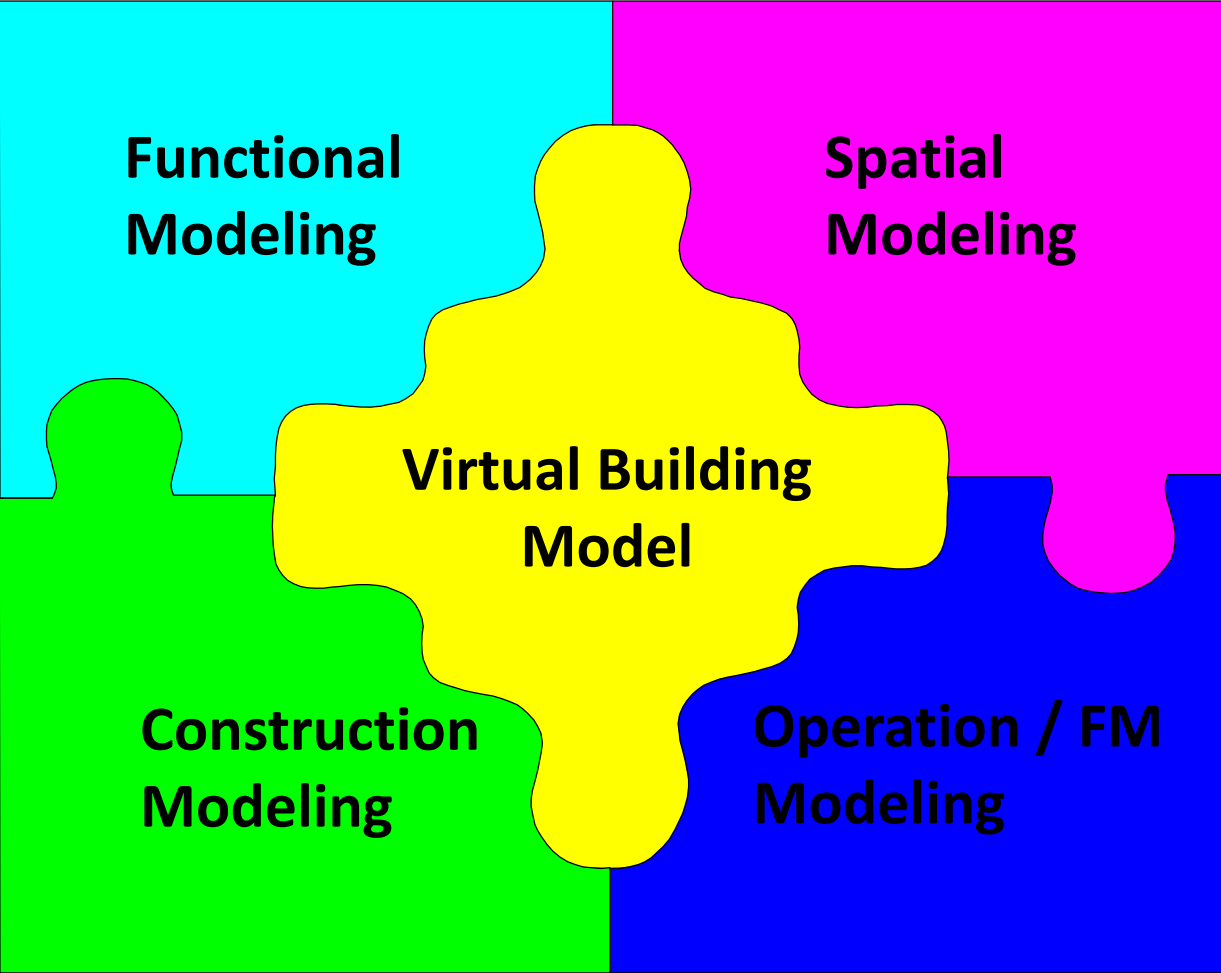
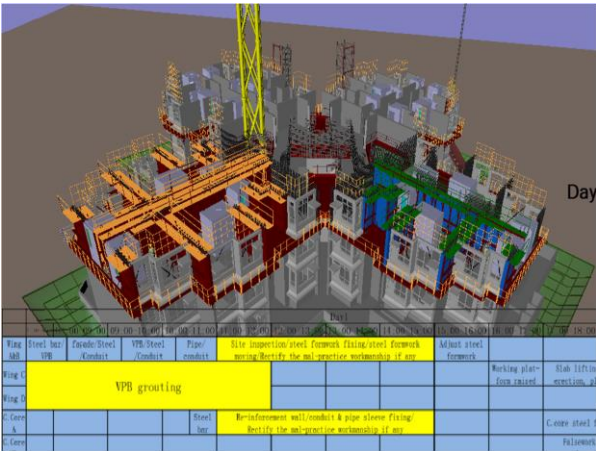
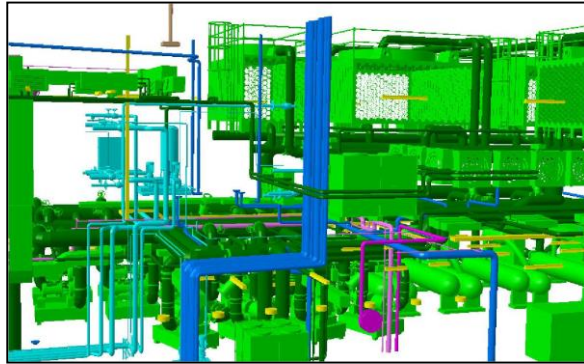


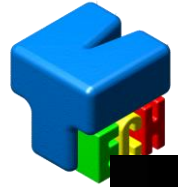
- MTECH Introduction
- **BIM for Building Construction**
- Digital Construction for DFMA
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- Conclusion

Agenda



Our Shared Vision - BIM





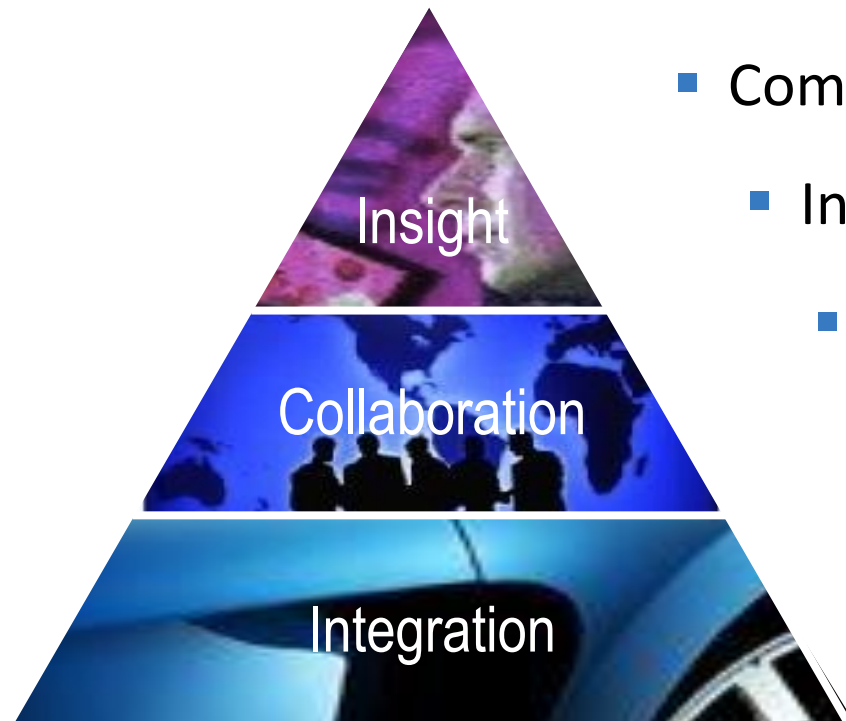
BIM Project



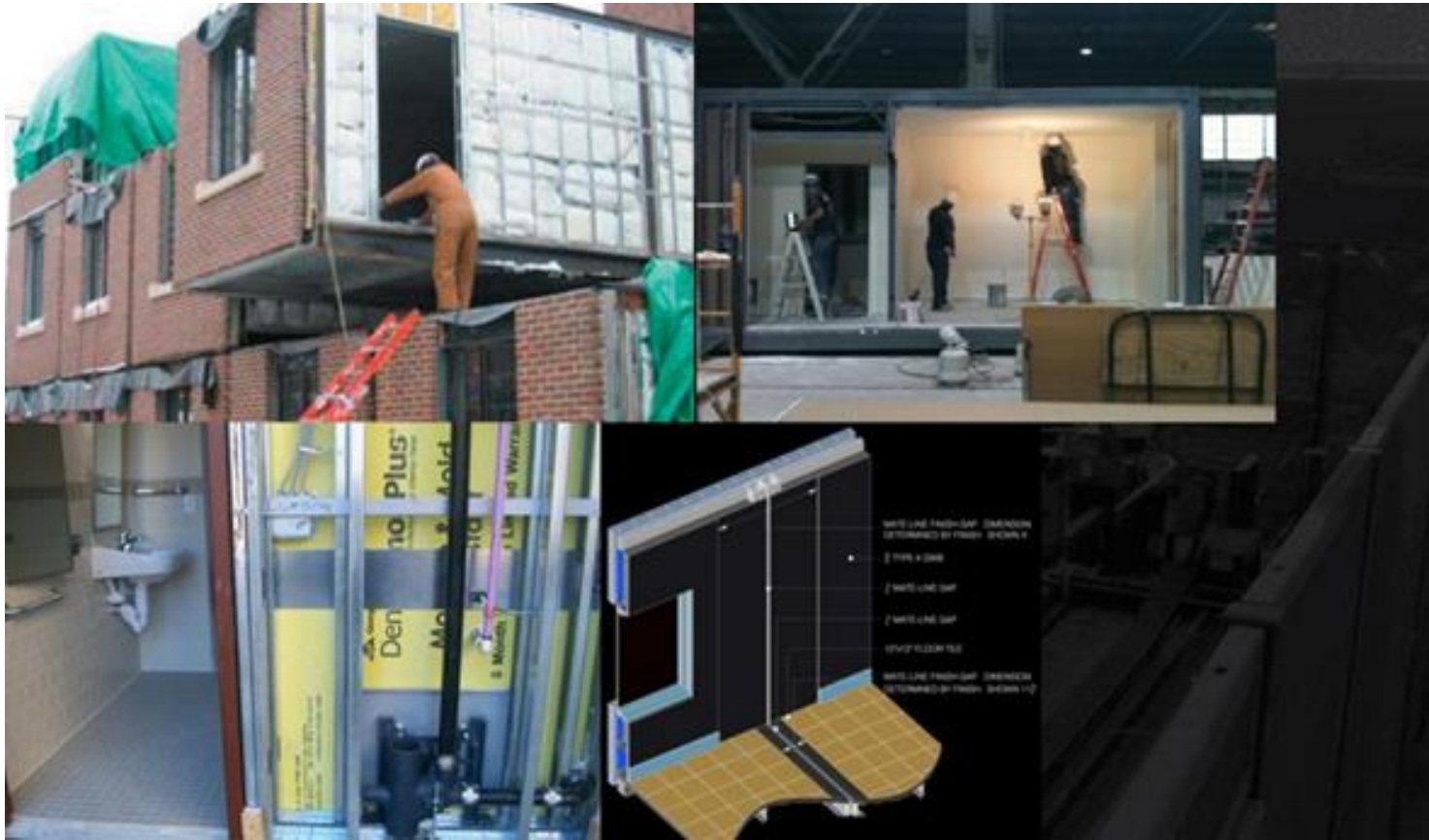


BIM

Bridging the gap between concept, design, construction & operation



- Common understanding
 - Informed decision making
 - Conflict/issues brought openly to table
 - Reduced risk/improved build quality
 - Confidence in achieving right first time

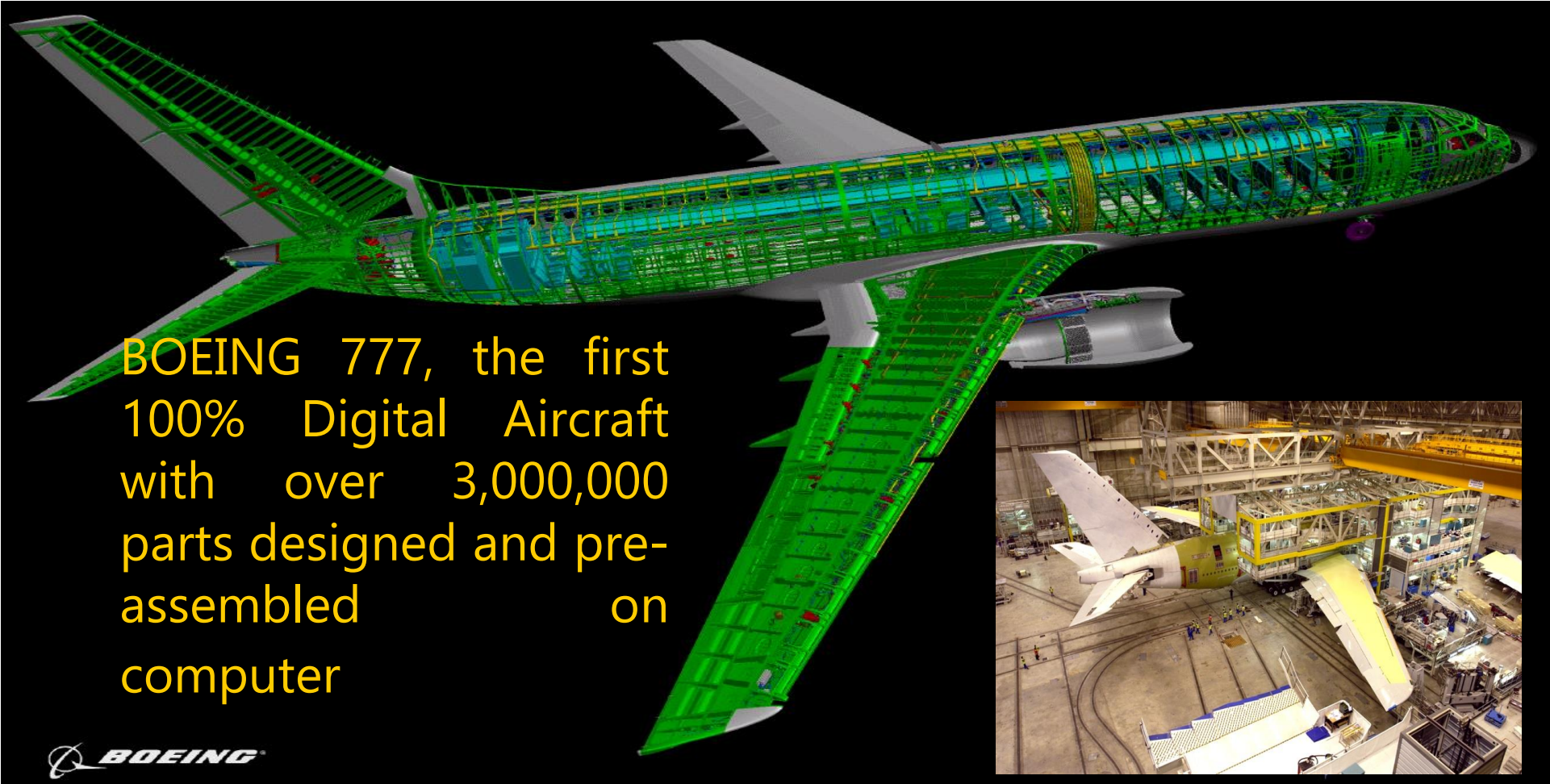


- MTECH Introduction
- BIM for Building Construction
- Digital Construction for DFMA
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- Conclusion

Agenda

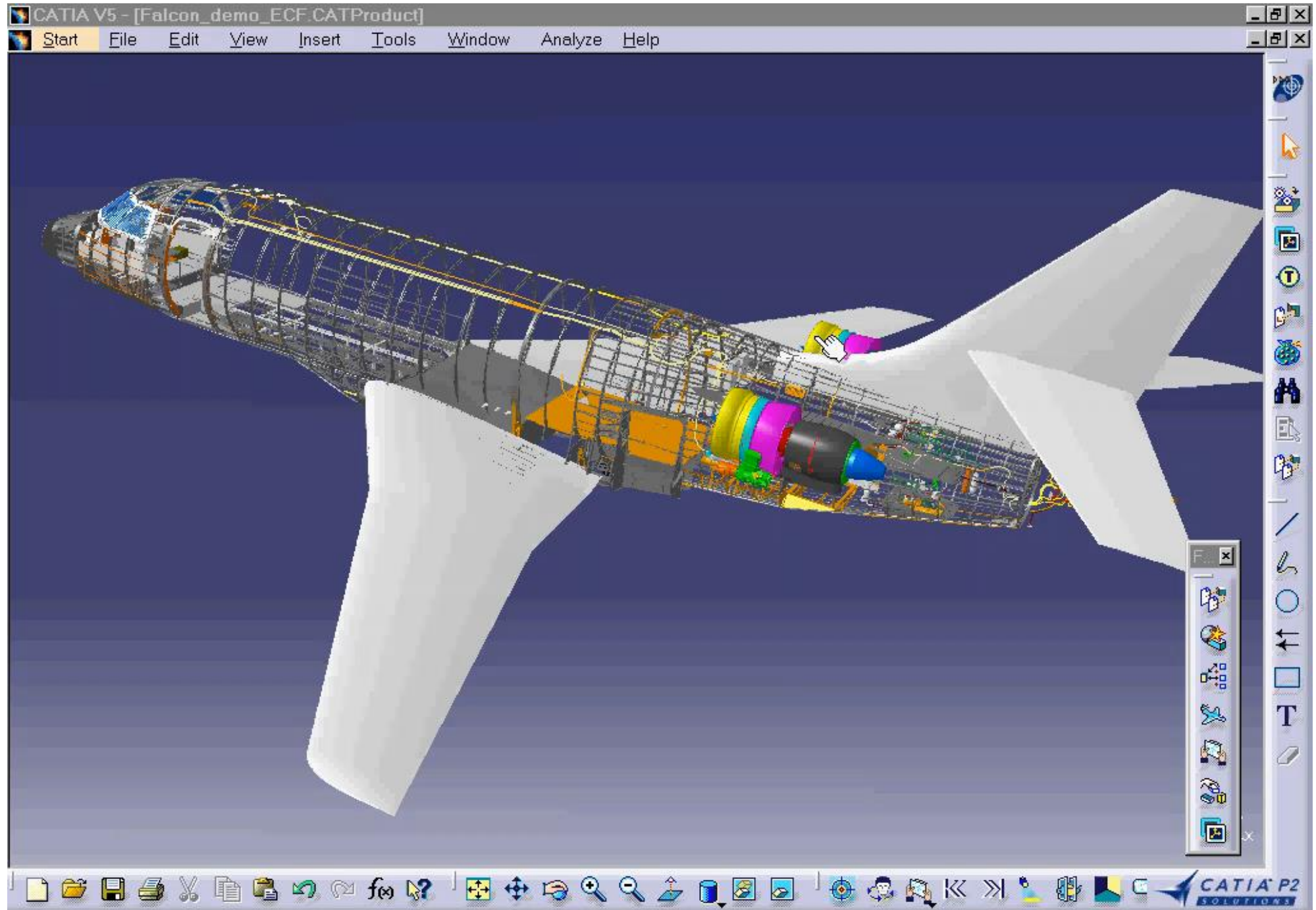


Boeing 777 the largest Digital Project of the last Century



BOEING 777, the first 100% Digital Aircraft with over 3,000,000 parts designed and pre-assembled on computer

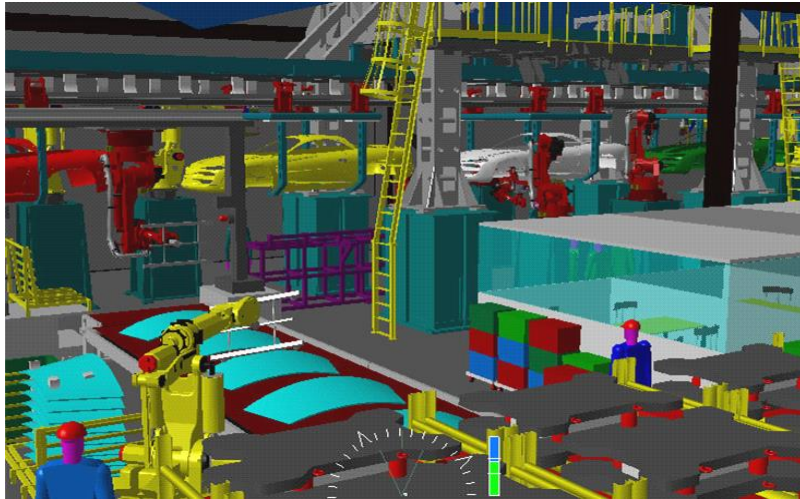






DIGITAL Automotive

Car – Process – Plant Integration

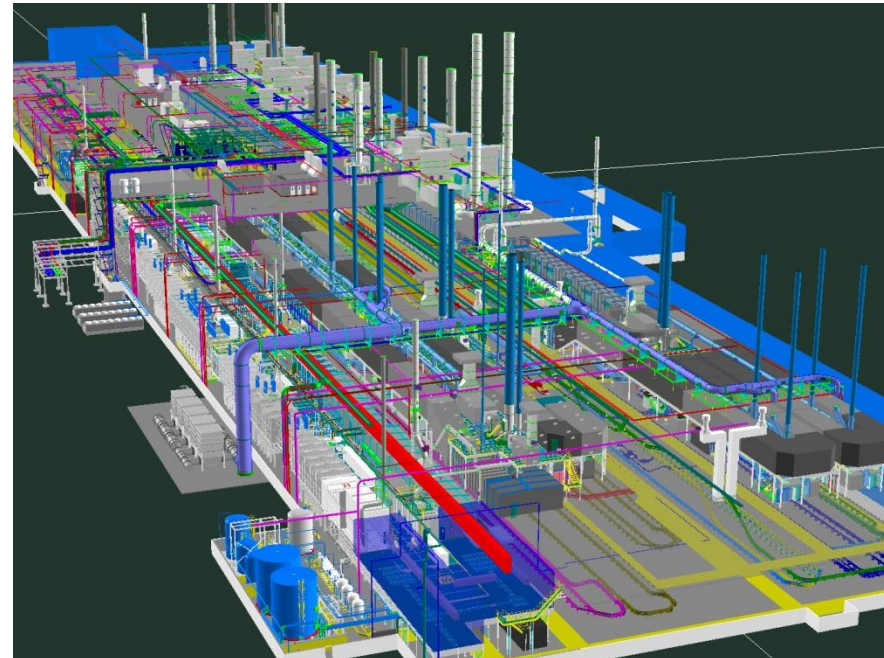


New Jeep Plant / Toledo Plant: *The first ever Integrated Car - Process - Plant Design*

- 8 AEC Organizations interacting
- 1,000,000 Sq Ft Plant; > \$1Billion Project

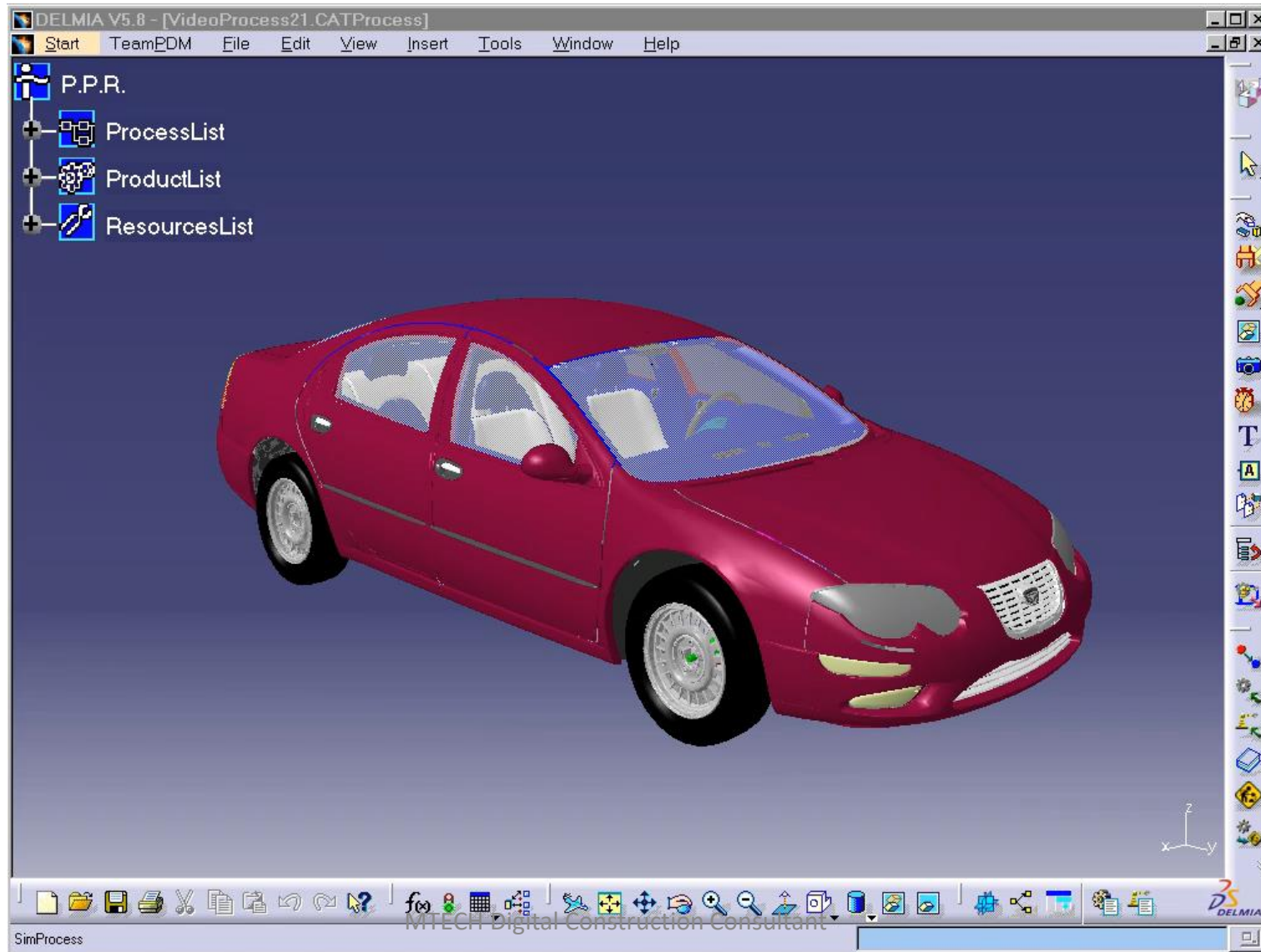
Business OBJECTIVES

- Dramatic Time to market reduction
39-month 1993; 28-month 2000; goal 24 /12 –month
- Error Free Manufacturing Process
- The Best Cars @ Competitive Price

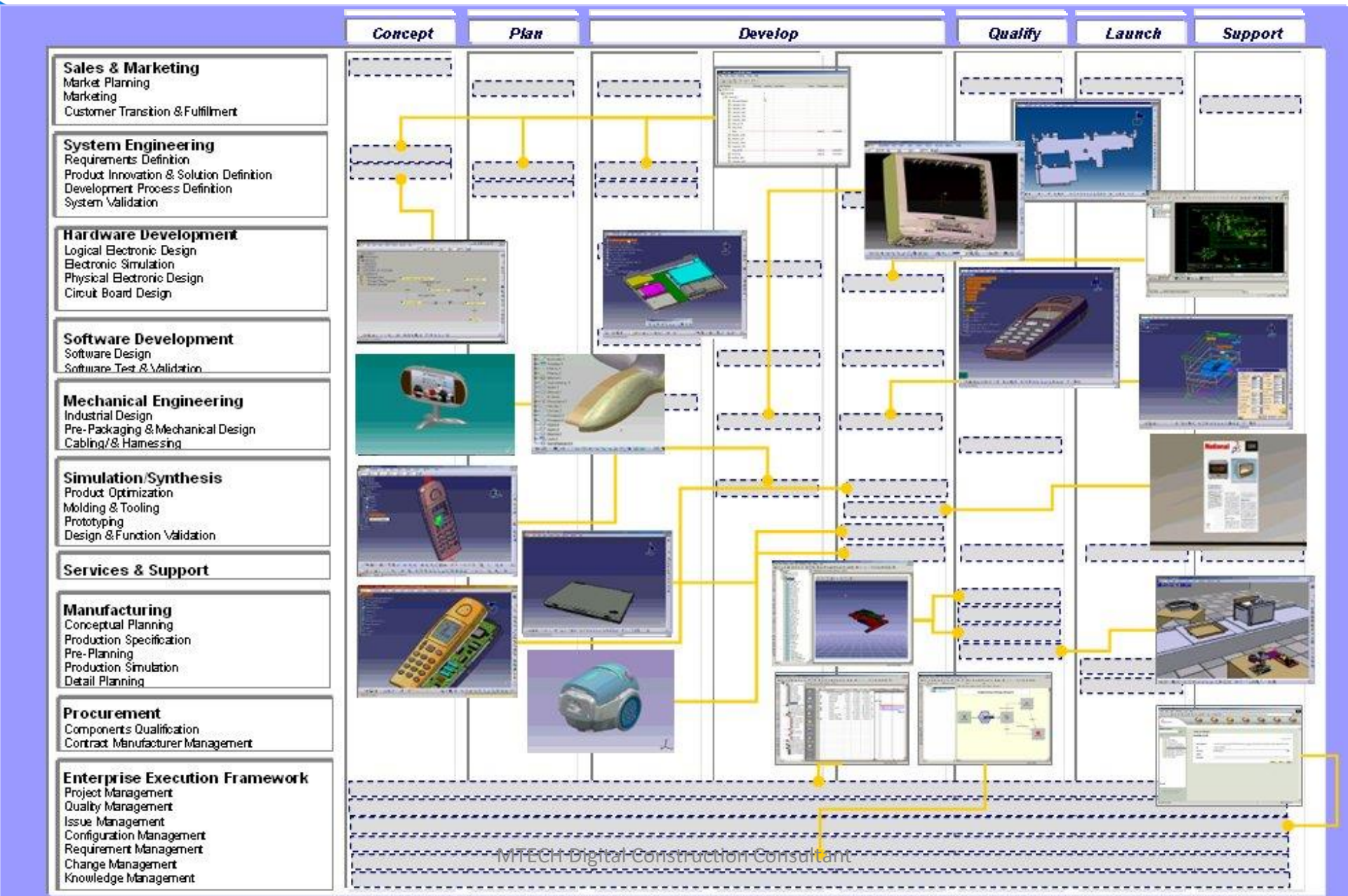
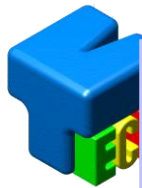




PPR – Produce /Process /Resources



Electronic Devices - Integrated Product Development

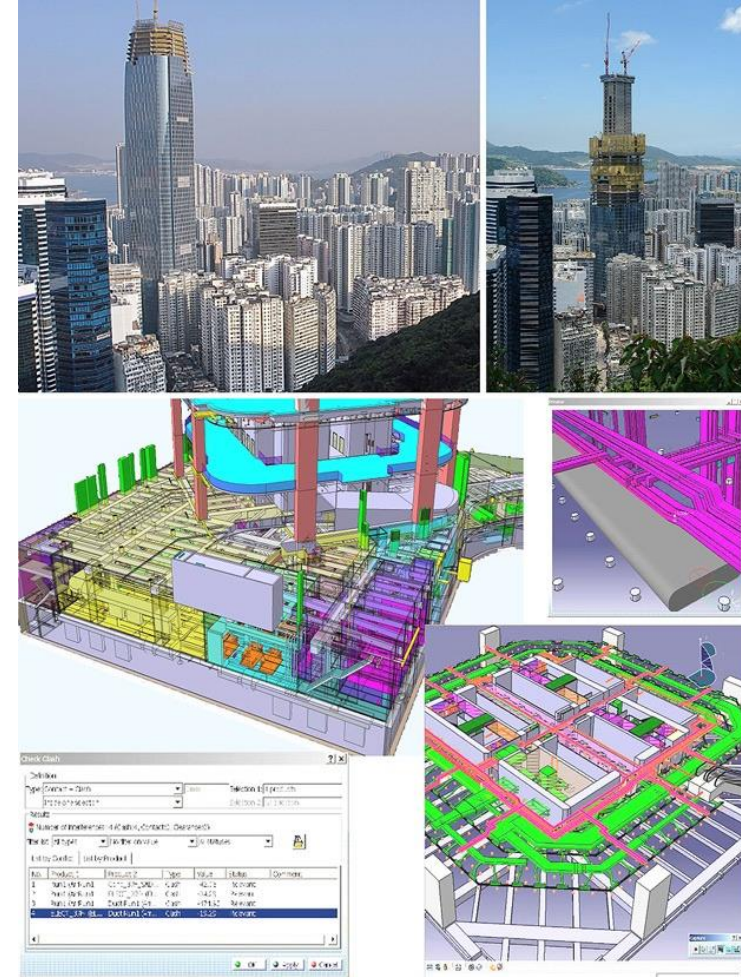


What If Building Construction?



Building Information Modeling

- Building Information Modeling (BIM) which has been defined as “a digital representation or **visualization** of physical and functional characteristics of a facility. In addition BIM serves as a **shared knowledge** resource for information about a facility forming a reliable basis for **decisions** during its life-cycle from inception onward”





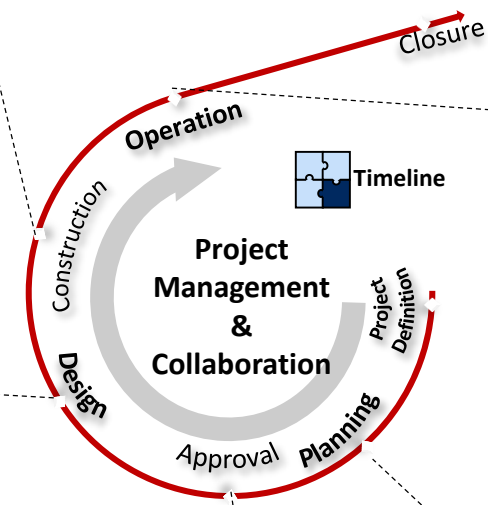
Digital Construction Portfolio

IV. Digital Construction

10. Fabrication & Detailing (Work instructions) 	11. Safety Planning 	12. Detailed Excavation Design 	13. Site Preparation & Schedule Control 	14. Bid Preparation & cost control 	19. Inspection & Renovation Management
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III. Detailed Design

4. Detailed Design & Engineering a. Structure Steel b. Structure Concrete c. MEP 	5. Civil Engineering Design 	6. Simulation & Analysis 	7. Civil Engineering Advanced Structural Analysis
8. Component Design & Simulation 	9. Systems Integration 		



V. Operation & Facility Management

15. Component Monitoring & Upgrade 	18. Operation & Maintenance Management
16. Integrated Building Monitoring 	17. Space & Equipment Management

I. Conceptual Design

1. Integrated Planning
2. Conceptual Cost & Schedule

II. General Arrangement

3. General Arrangement & Documentation

Value Proposition of DFMA



PRODUCTIVITY
IMPROVEMENT



BETTER QUALITY
CONTROL



BETTER
CONSTRUCTION
ENVIRONMENT



SAFETY
IMPROVEMENT



REDUCTION OF ON-
SITE MANPOWER

DFMA Consideration



Types of Buildings for DFMA



Early involvement of Contractors & Manufacturers



Configuration of Modulus



Transportation

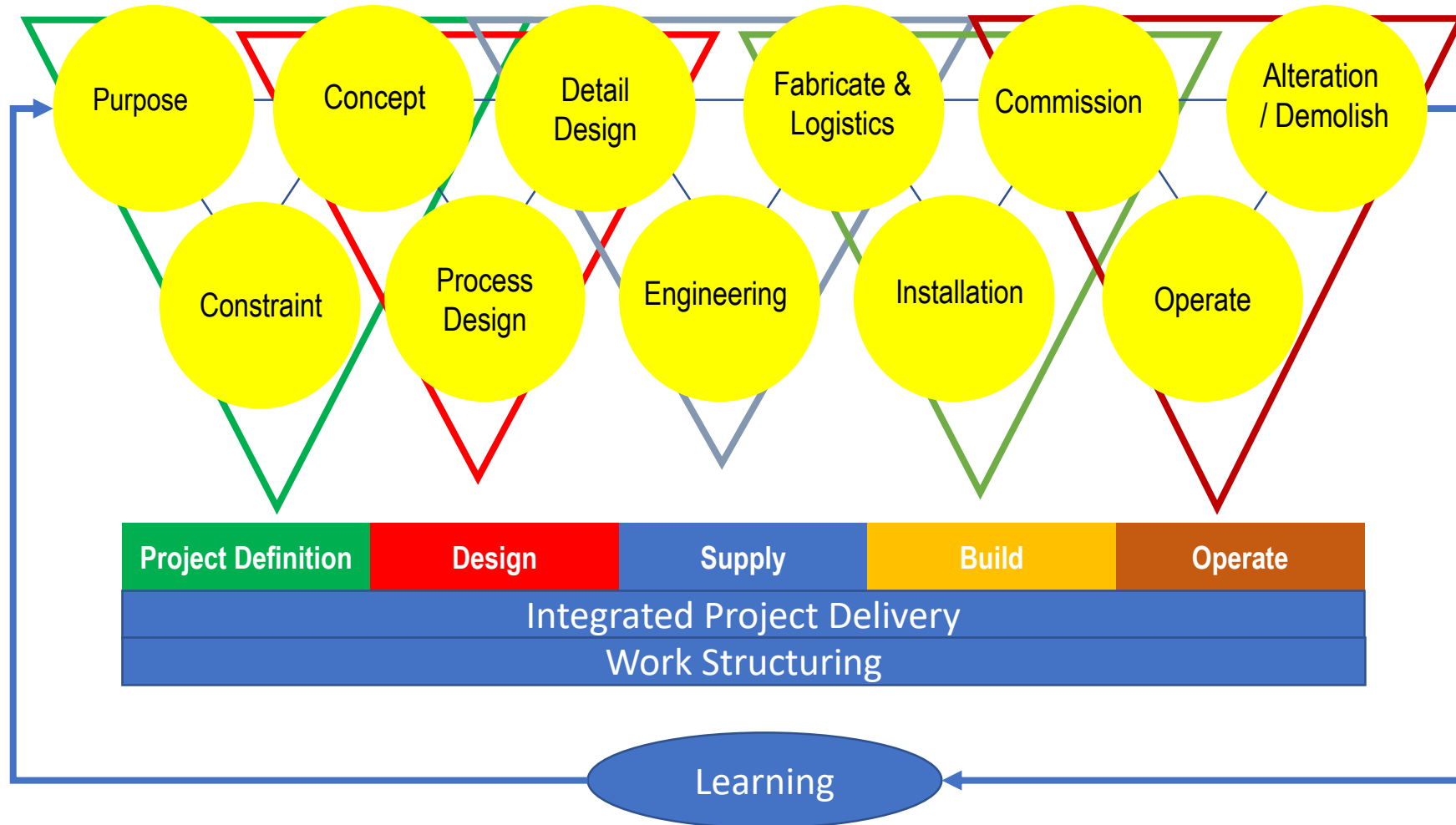


Type of Hoisting Machinery



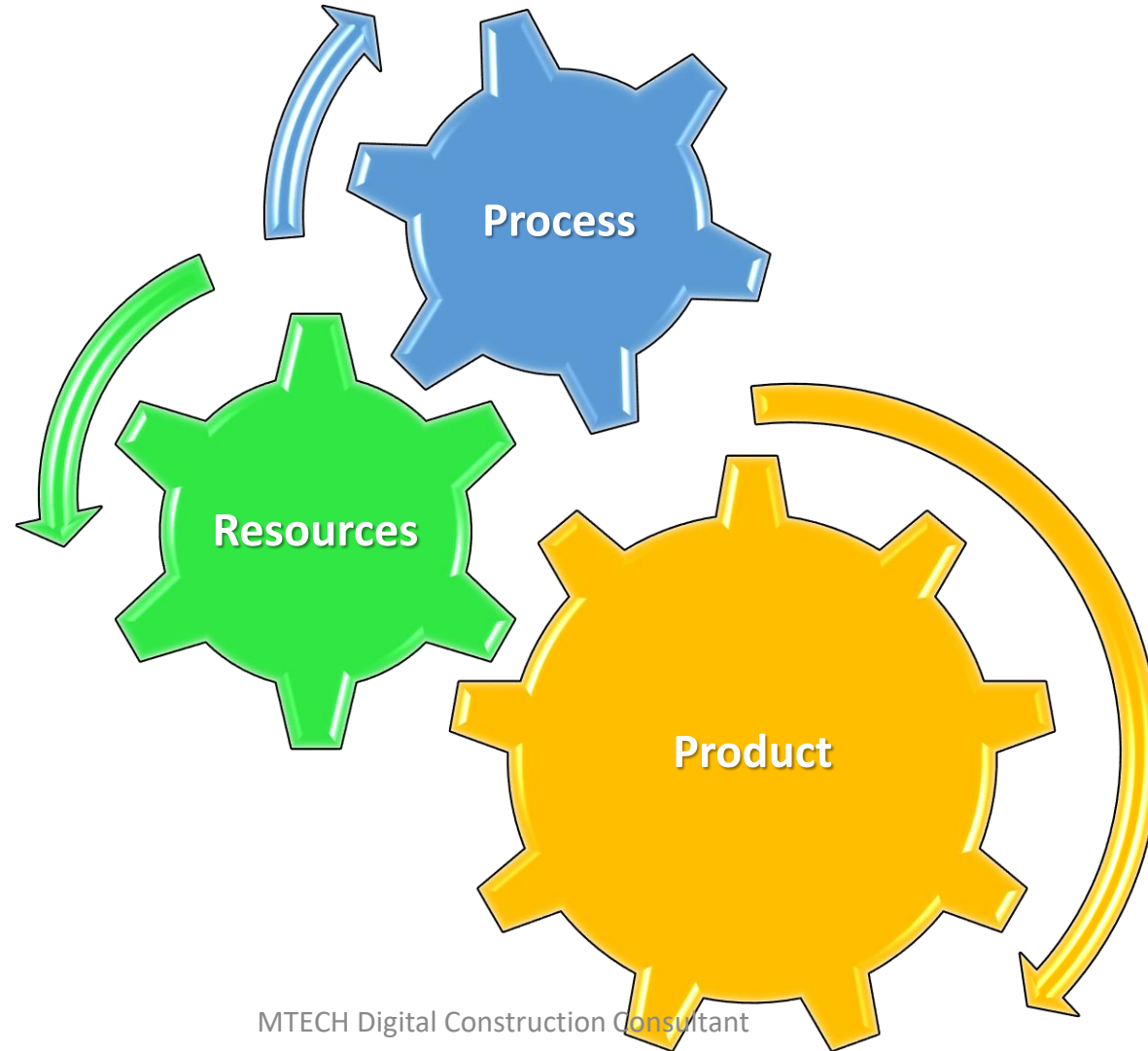
Integrated Project Delivery

Lean Project Delivery System (Ballard, 2000 and 2006)



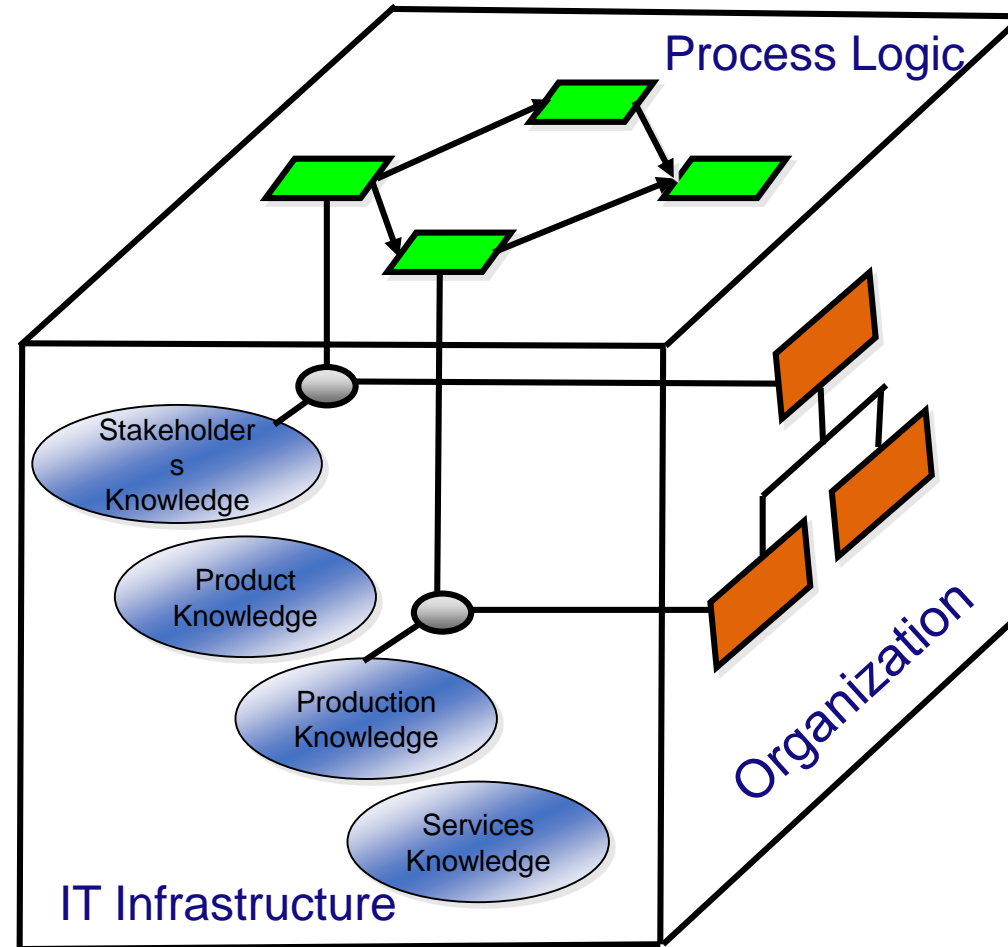


IPD is understanding of the whole.

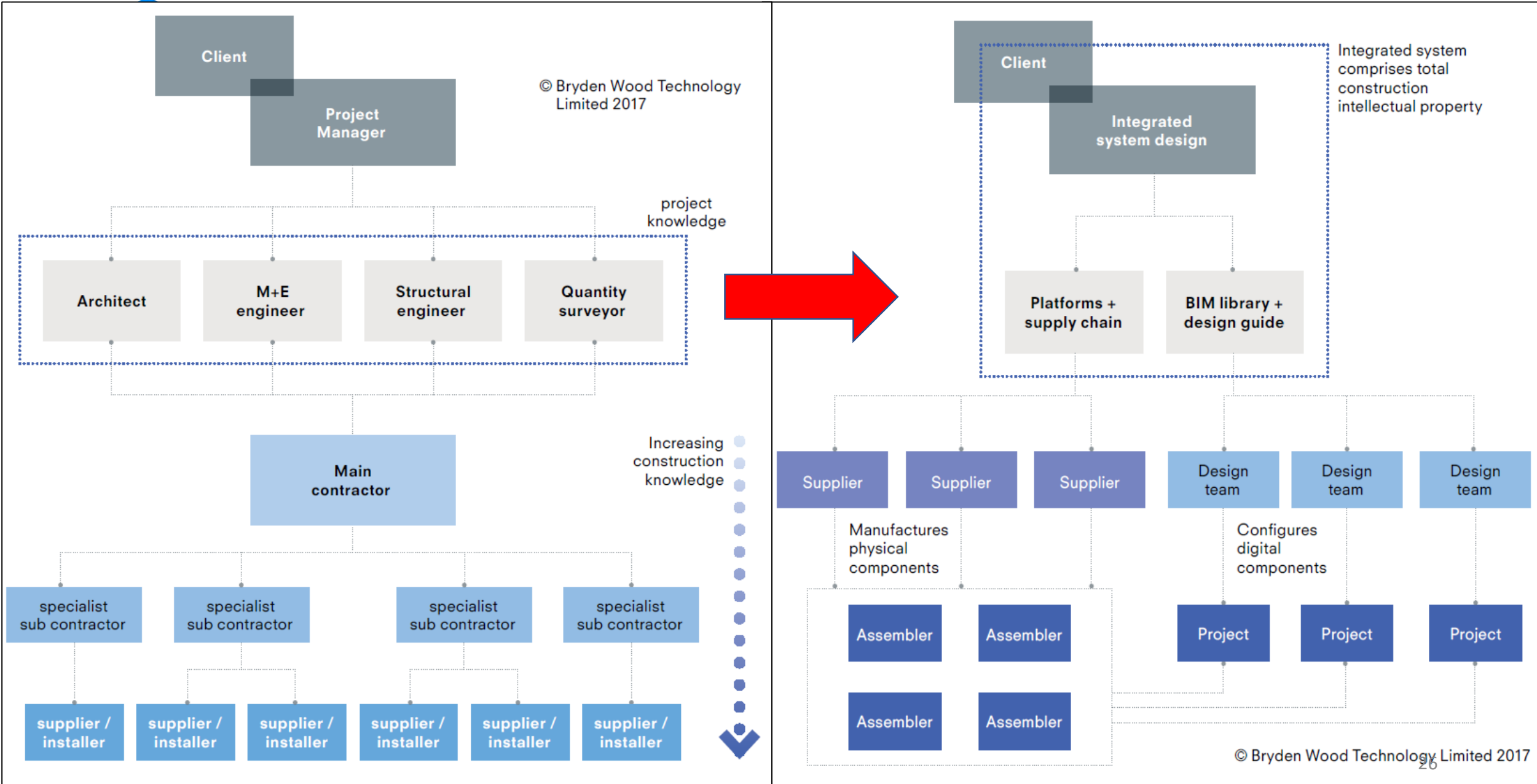




Three Dimensions of Workflow



Organization Changes



Design Considerations



Modularization



Early coordination



Design compliance & accuracy



Construction Tolerance



Connections in-between modulus



Periodic structural inspection



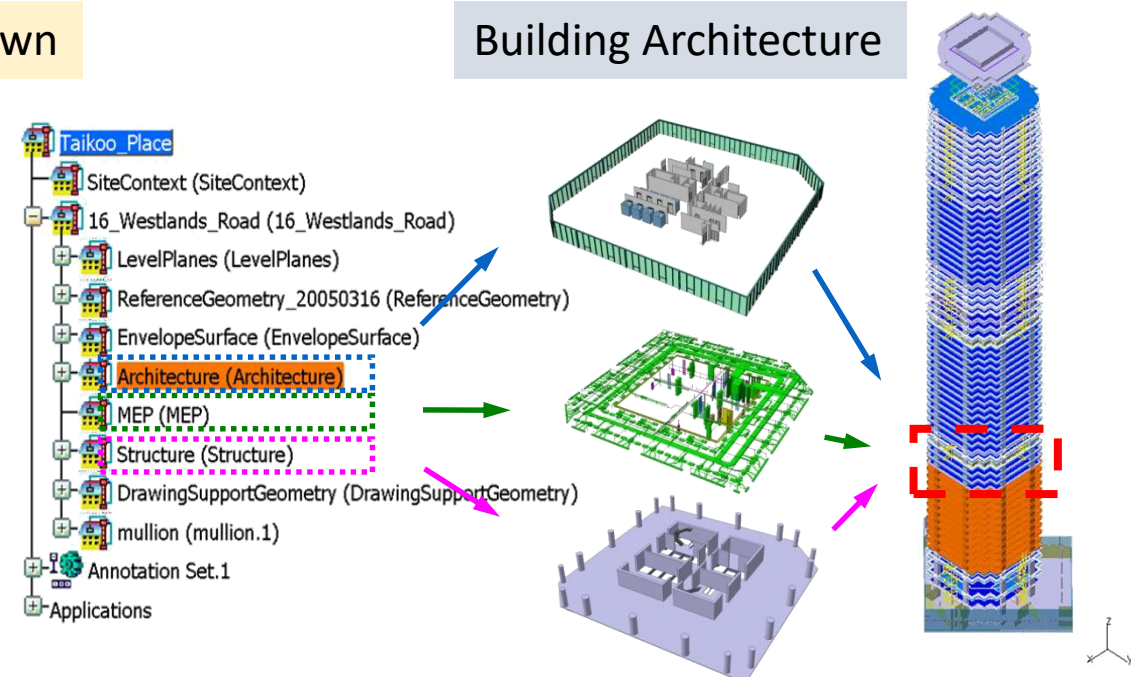
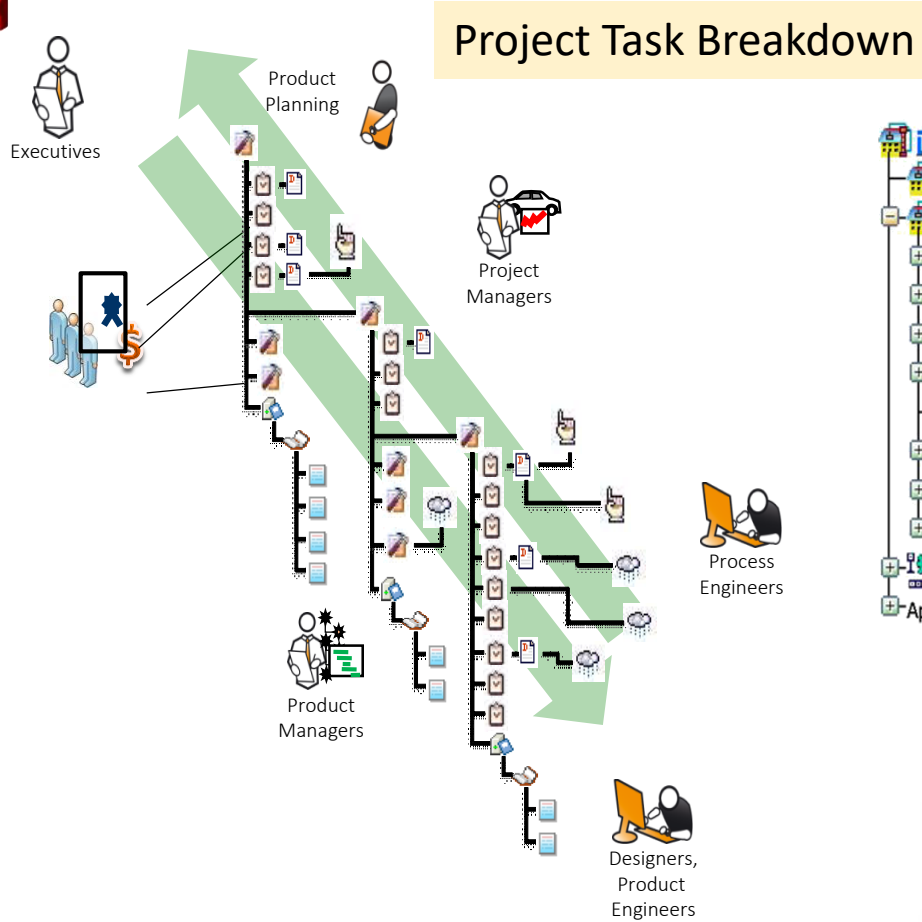
Integrity and coordination of MEP



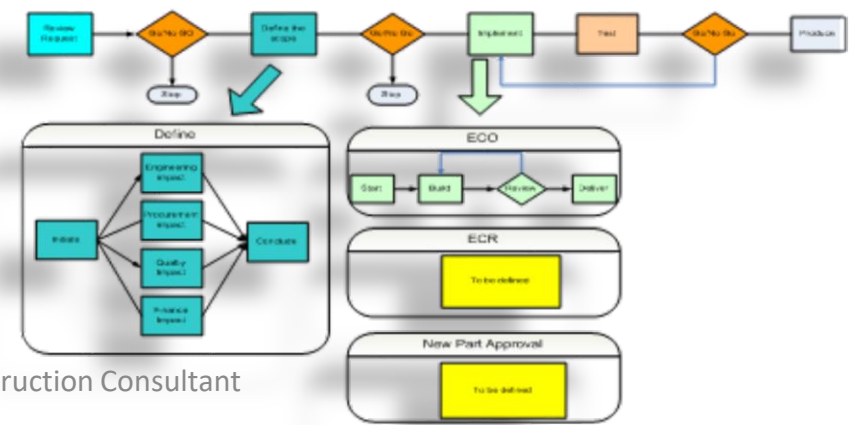
Manufacturing constraint & management

BIM Level 3

Product / Process / Resource Interaction



Process Breakdown



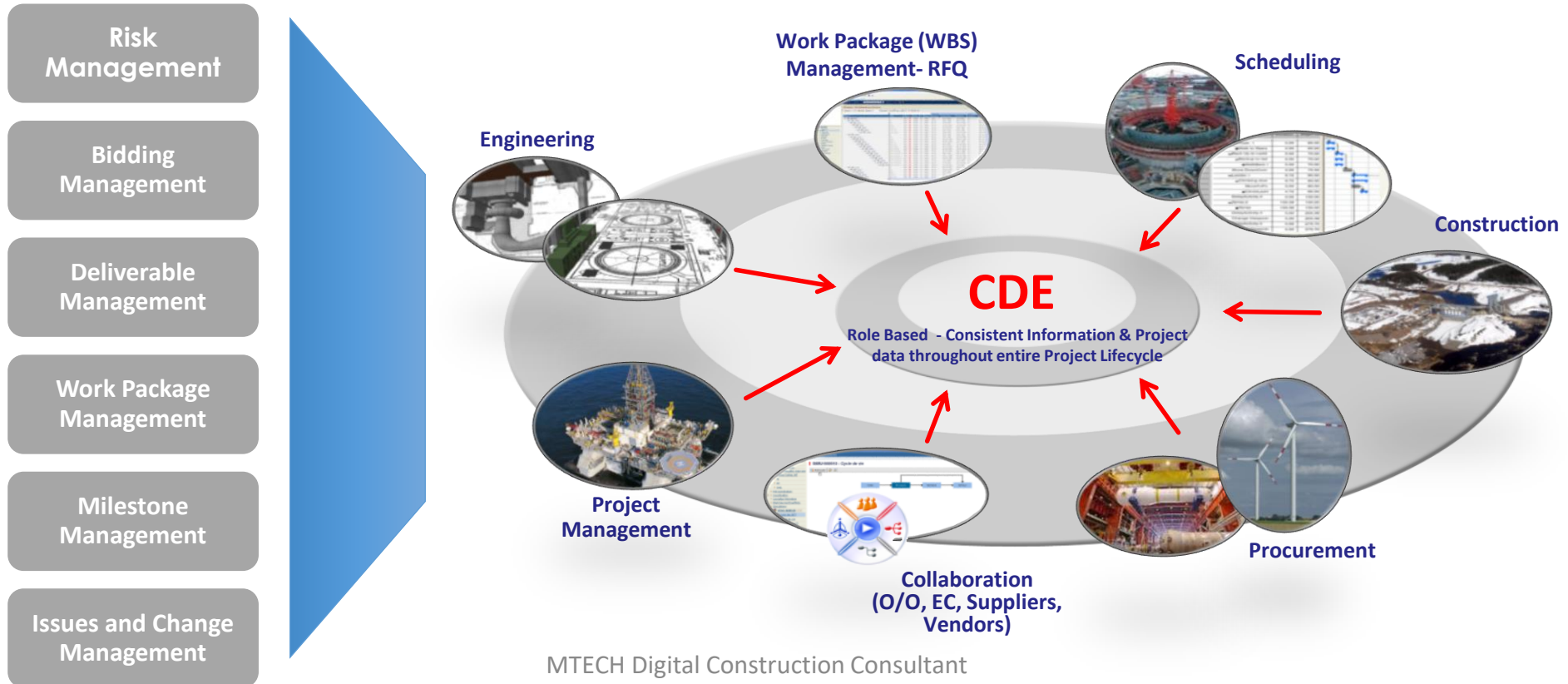


Capital Project Management

Common Data Environment CDE

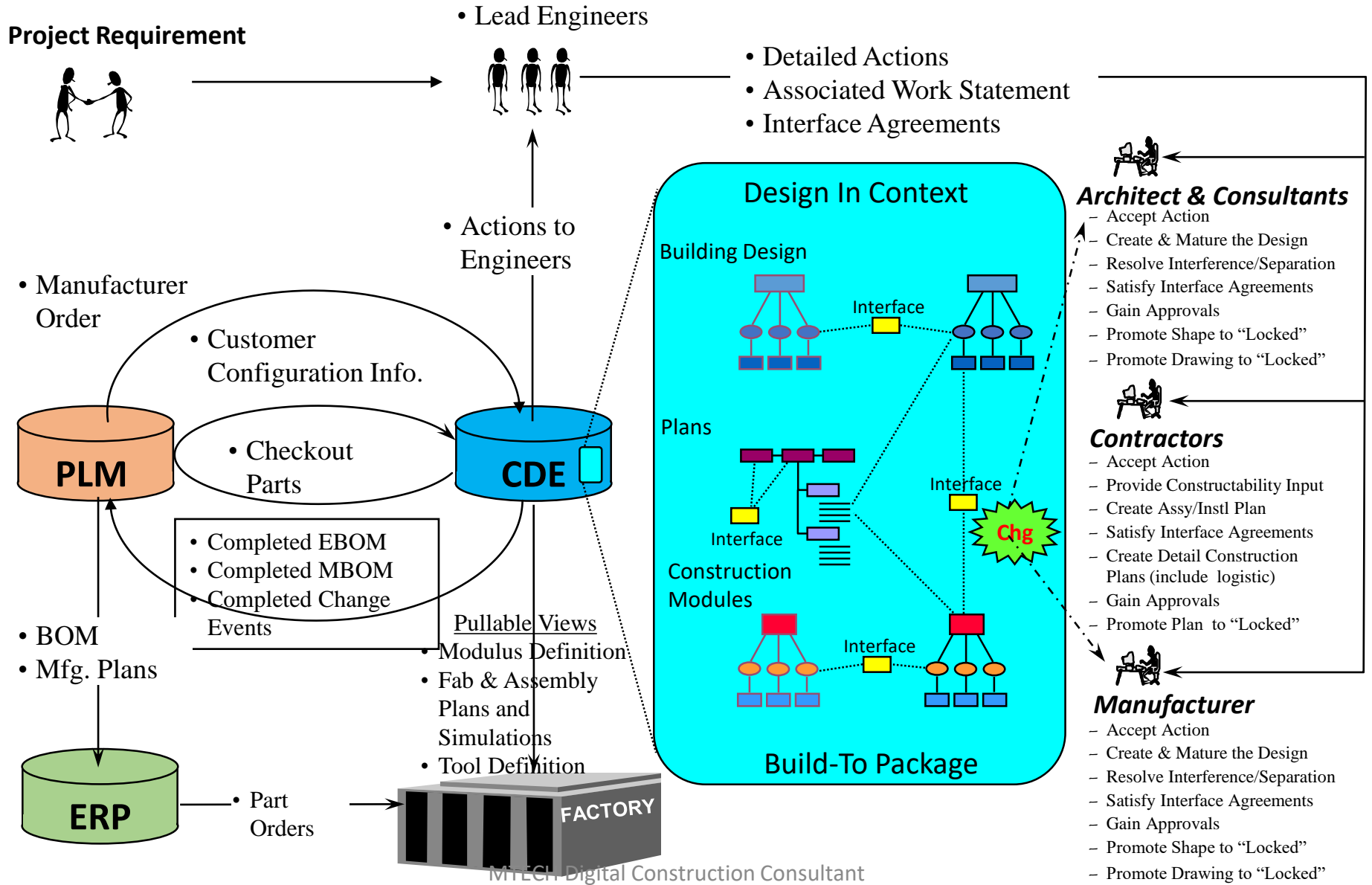
Manage all aspects of project or program execution: deliverables, schedules, resources, work requests/orders/permits, risks, issues in one integrated system .

Bringing it all together



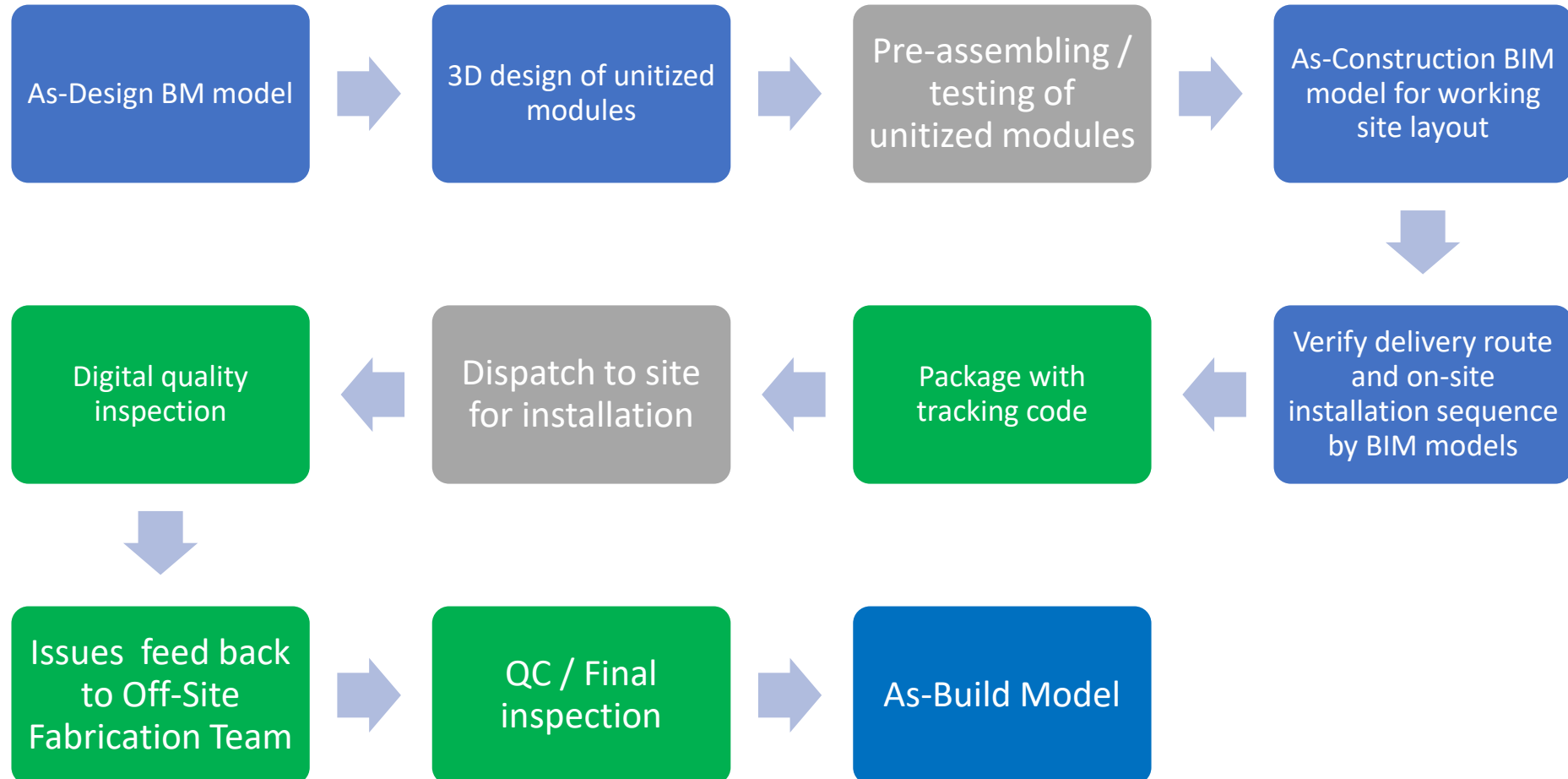


DFMA Information Flow



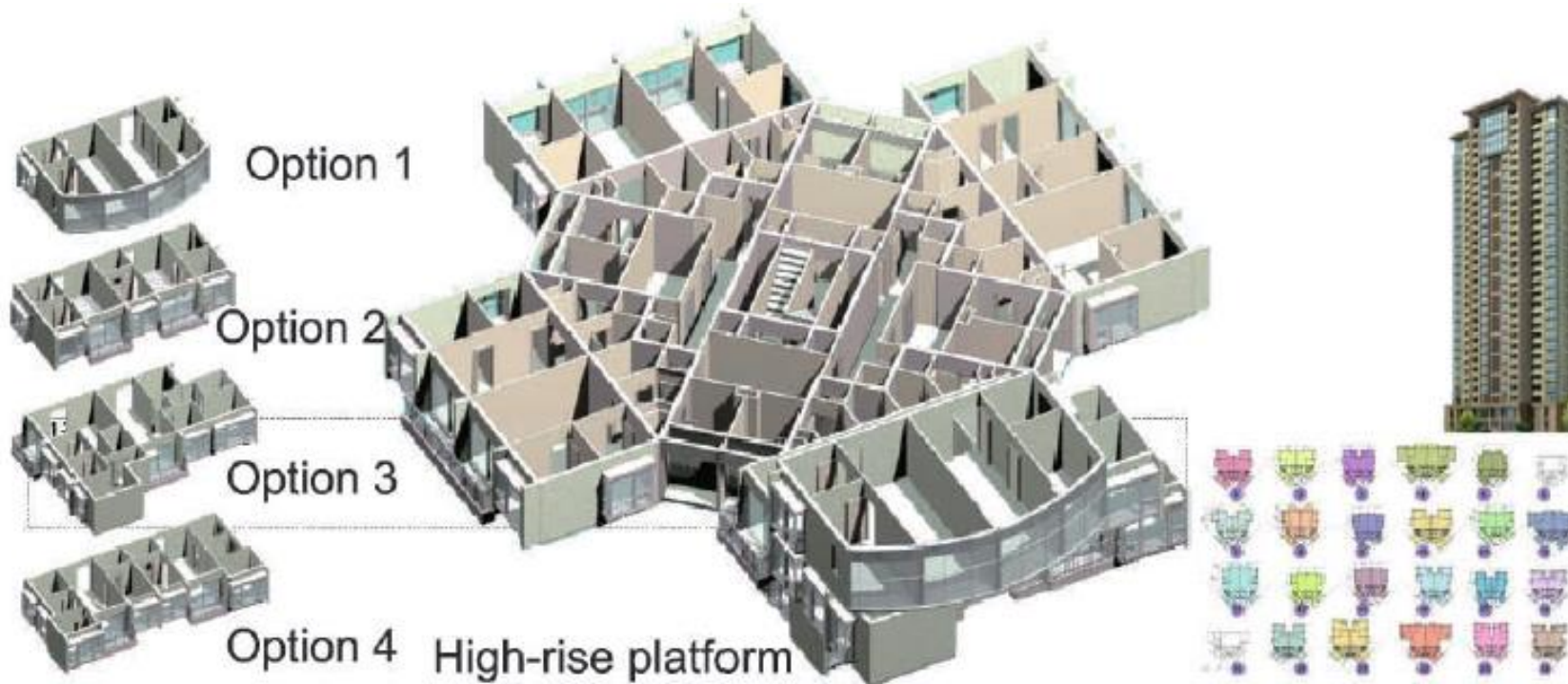


The Digital Process





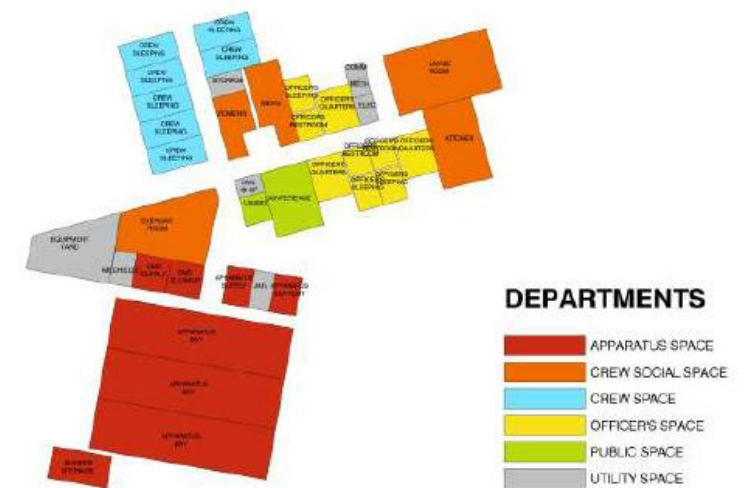
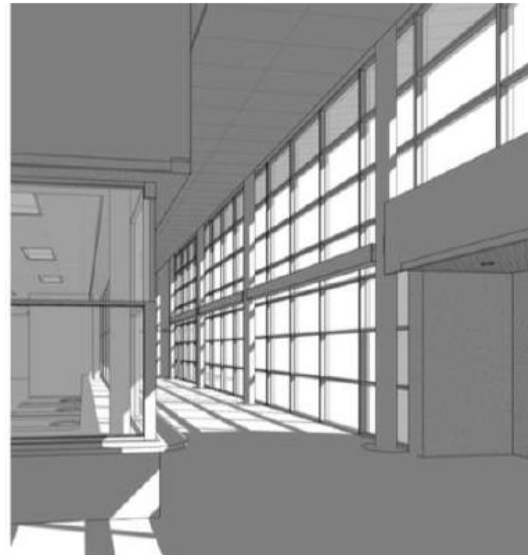
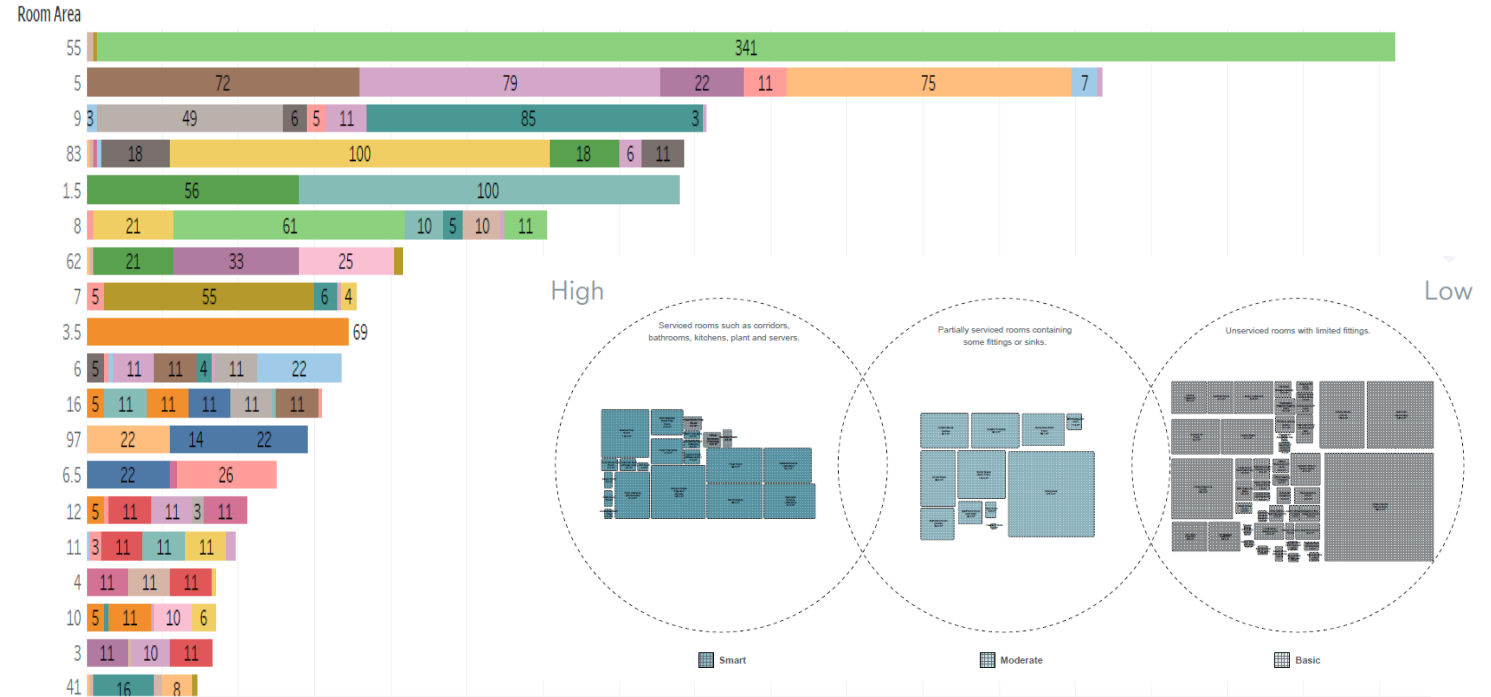
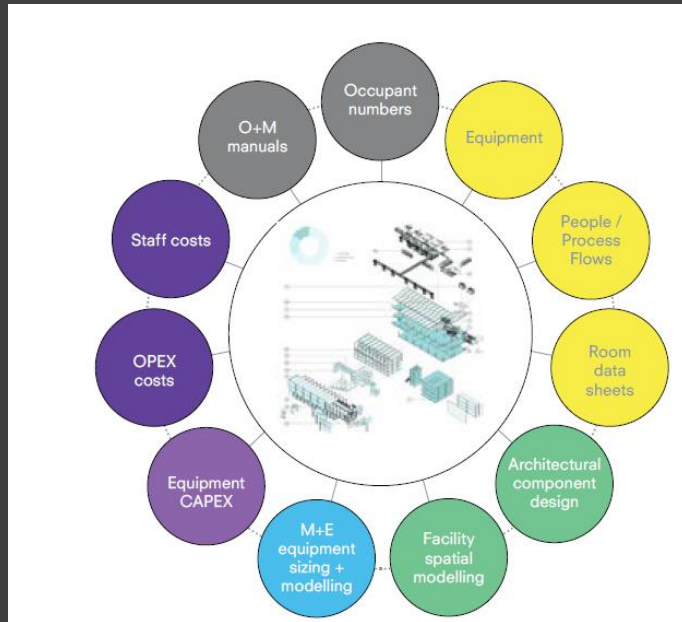
Modularization - Adaptable Building



.....Customized Apartment Building

Ref: Andrew KC Chan, 'Tackling_Global_Grand_Challenges_in_Our_Cities', ELSEVIER, 2016

Visualization & Analysis of Quality of Space





Standardization

The screenshot shows a web browser window displaying the BIMObject website. The address bar shows the URL `bimobject.com/en-us/product?freetext=LIGHTING`. The page features a navigation bar with the BIMObject logo and links for 'Browse BIM objects', 'Solutions', 'News', and 'About us'. A search bar on the left indicates 6,888 product families and 4,414,621 brands. The main content area is a grid of 48 product thumbnails, each with a small image, a title, and a manufacturer name. The products include various lighting fixtures such as 'Lighting Indoor LED Cylinder 115W', 'Fail Safe™ ORM LED', 'Metalux™ SkyBar LED', 'Lighting fixtures OWA - Odnwald Reception', 'CAST LED Perimeter Light (*CPL1)', 'CAST LED Perimeter Wall Pack Light', 'Streetworks™ UTLD LED', 'Metro LED Signband Platform Lighting', 'iLumin - Lighting Control Network Jack, LCN, Access', 'Namsos Norlys', 'DNV Entri Round Reveals LED', 'DNT Entri Triangle Reveals LED', 'ENC Entri Round Clean LED', 'Metalux™ Accord Series 2AC', 'Halu™ HU20 LED Undercabinet', 'Metalux™ HBLEED', 'Metalux™ Accord LED Series 14AC Recessed', 'Fail Safe™ UCL', 'Cruze Recessed LED Luminaire', 'Metalux™ Accord LED Series 22AC 24AC Recessed', 'Metalux™ Accord LED Series 22ACS 24ACS Surface', 'Fail Safe™ MAE LED', 'Commons Luminaire', 'Metalux™ All Pro™ APLBC/APLBA Series', 'LMIO-301 Digital Photocell Input Module', 'LMCP Series Relay Panel Interiors (LMCP8, LMCP24, WaterStopper)', 'Sure-Lites™ ADL 2 Series', 'Streetworks™ GAN Galleon LED Wall Mount', 'McGraw-Edison™ GLEON Galleon LED Wall', 'Metalux™ Steeler LED', 'IST Impact Die Trapezoid HD', 'Invue™ EMLS Epic Modern Medium Spider Mount', 'VST Venus LED', 'TMU Talon LED', 'VST Venus LED', 'TLM Talon Medium', 'Ludic Touch Free-standing luminaire PL separate', 'Ludic Touch Free-standing luminaire DS separate', 'Ludic Touch Free-standing luminaire DD separate', 'Ludic Touch Desk-mounted luminaire PLP separate', 'Ludic Touch Desk-mounted luminaire DSP separate', 'Ludic Touch Desk-mounted luminaire DDP separate', 'Arena Pro', and 'Stage Round Spot'. The Windows taskbar at the bottom shows the search bar and several application icons.

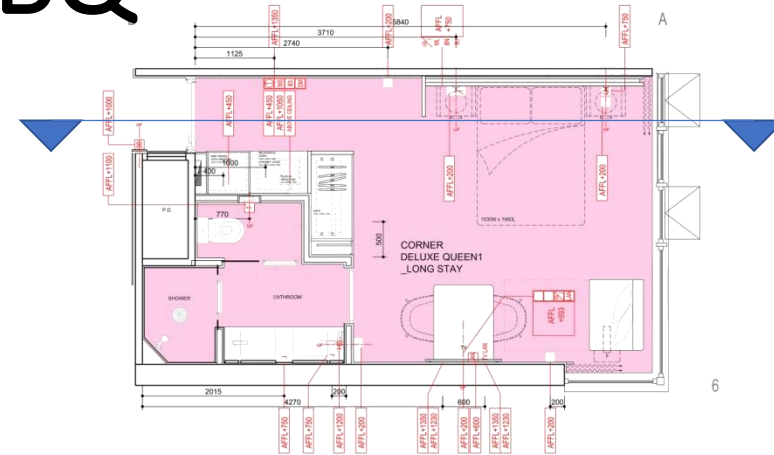
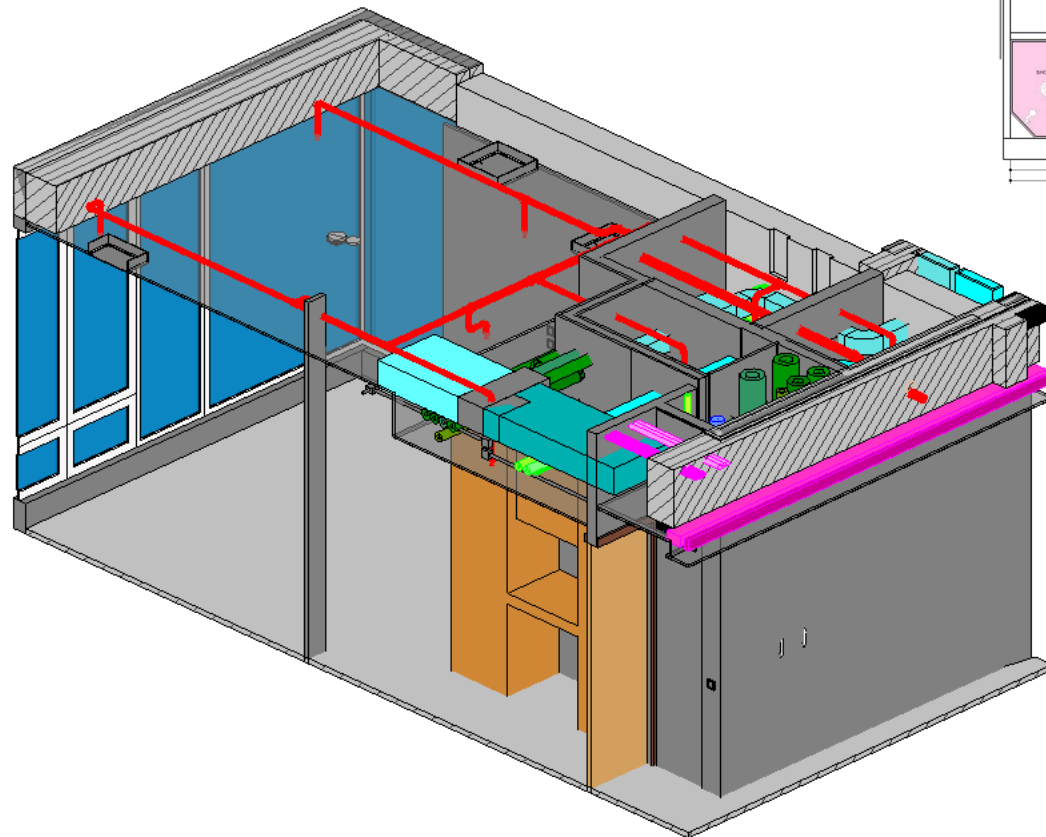


Modular Flat Layout





Modular Design with BQ

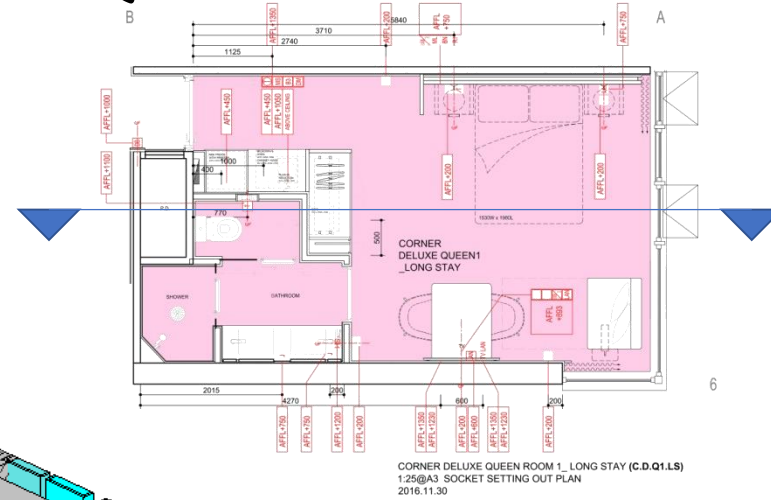
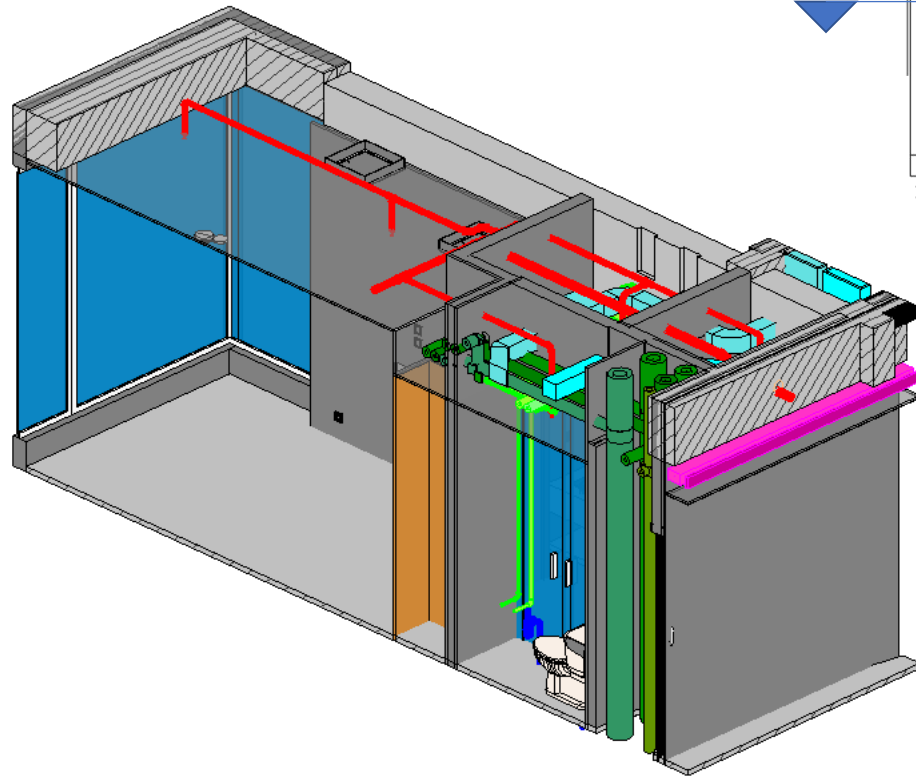


CORNER DELUXE QUEEN ROOM 1, LONG STAY (C.D.Q1.LS)
1:25@A3 SOCKET SETTING OUT PLAN
2016.11.30

Room Schedule						
Number	Area	Volume	Occupancy	Floor Finish	Wall Finish	Ceiling Finish
5	115.37 SF	3573 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
27	1988.39 SF	38833 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Circulation: 2 2103.76 SF						
10	436.32 SF	6327 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
13	313.14 SF	4541 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
14	388.36 SF	5196 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
15	352.62 SF	5055 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
17	225.44 SF	3414 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
18	235.44 SF	3414 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
21	265.59 SF	3851 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
22	235.44 SF	3414 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
25	268.48 SF	3993 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
26	262.69 SF	3909 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
Office: 10 2961.54 SF						
28	193.44 SF	2805 CF	Office	Ceramic Tile	N/A	Acoustic Tile 2'x2'
Open Work Area: 1 193.44 SF						
35	293.53 SF	4296 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
39	163.62 SF	2372 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
20	142.97 SF	2073 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
23	165.37 SF	2386 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
24	161.96 SF	2347 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
Reception: 5 927.35 SF						
6	98.30 SF	845 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
7	311.76 SF	4521 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
8	312.28 SF	4528 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
9	53.79 SF	780 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Services: 4 736.13 SF						
2	108.14 SF	1568 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
1	79.04 SF	1146 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
Storage: 2 187.18 SF						



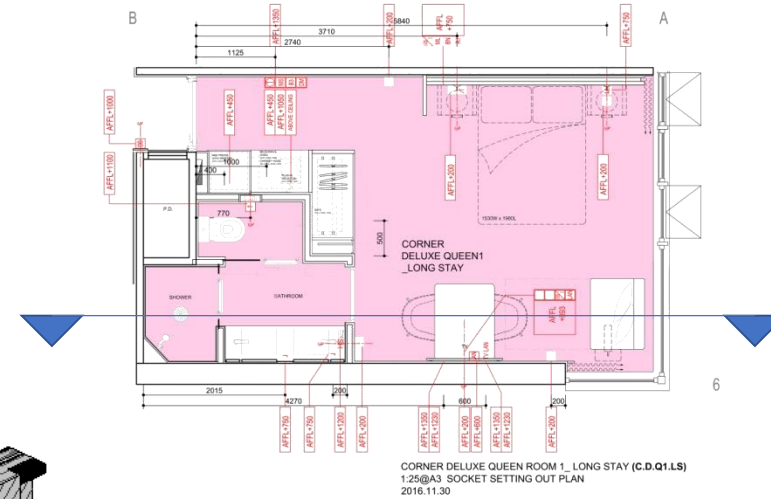
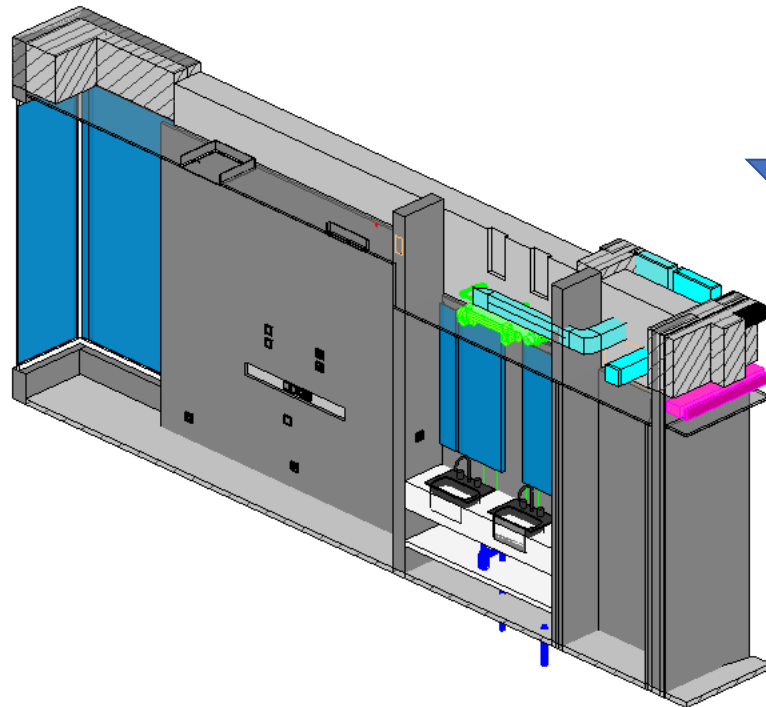
Modular Design with BQ



Room Schedule						
Number	Area	Volume	Occupancy	Floor Finish	Wall Finish	Ceiling Finish
5	115.37 SF	3573 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
27	1988.39 SF	38833 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Circulation: 2						
2103	2103.76 SF					
10	436.32 SF	6327 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
11	313.14 SF	4541 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
14	388.36 SF	5196 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
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18	235.44 SF	3414 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
21	265.59 SF	3851 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
22	235.44 SF	3414 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
25	268.48 SF	3993 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
26	262.69 SF	3909 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
Office: 10						
296	296.154 SF					
29	193.44 SF	2805 CF	Office	Ceramic Tile	N/A	Acoustic Tile 2'x2'
Open Work Area: 1						
193	193.44 SF					
35	293.53 SF	4296 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
19	163.62 SF	2372 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
20	142.97 SF	2073 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
23	165.37 SF	2386 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
24	161.96 SF	2347 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
Reception: 5						
927	927.35 SF					
6	98.30 SF	845 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
7	311.76 SF	4521 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
8	312.28 SF	4528 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
9	53.79 SF	780 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Services: 4						
736	736.13 SF					
2	108.14 SF	1568 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
1	79.04 SF	1146 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
Storage: 2						
187	187.18 SF					



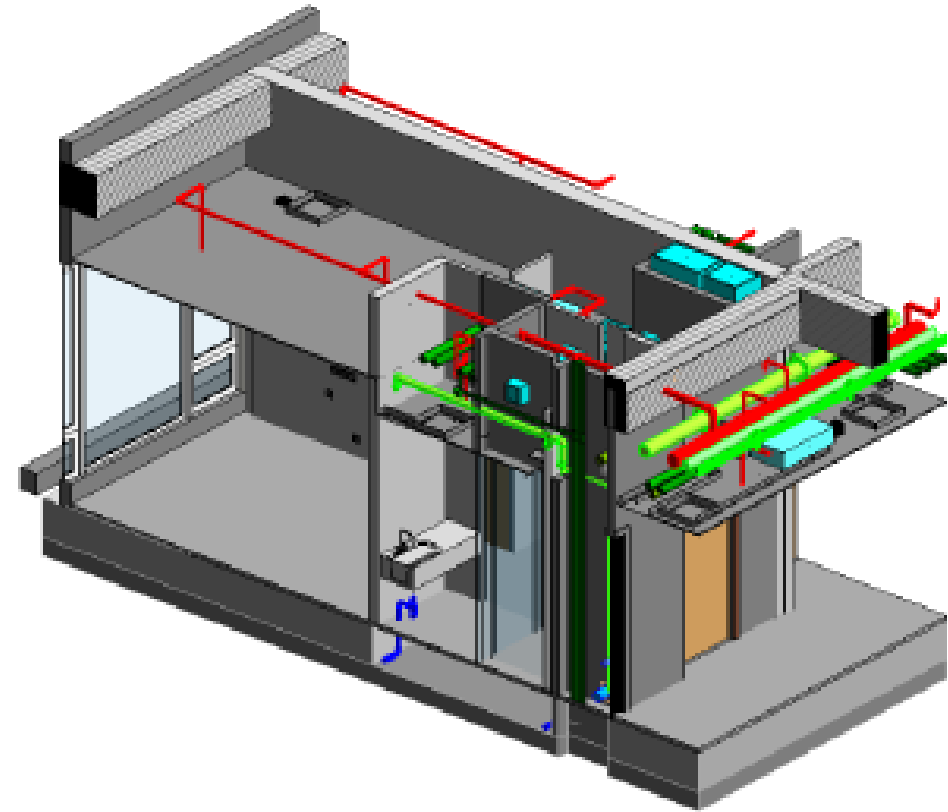
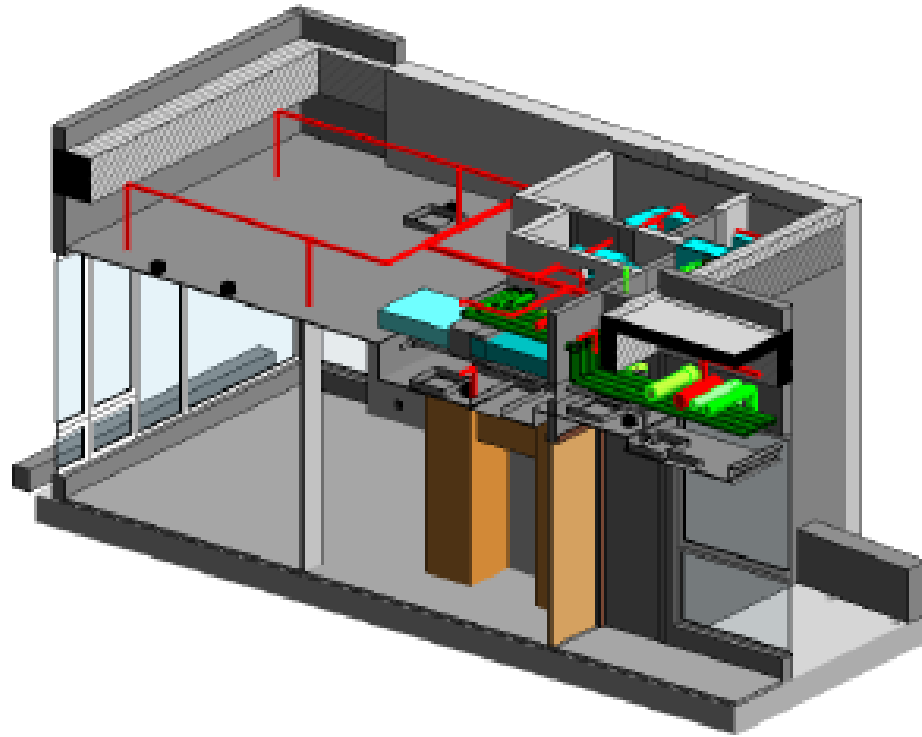
Modular Design with BQ

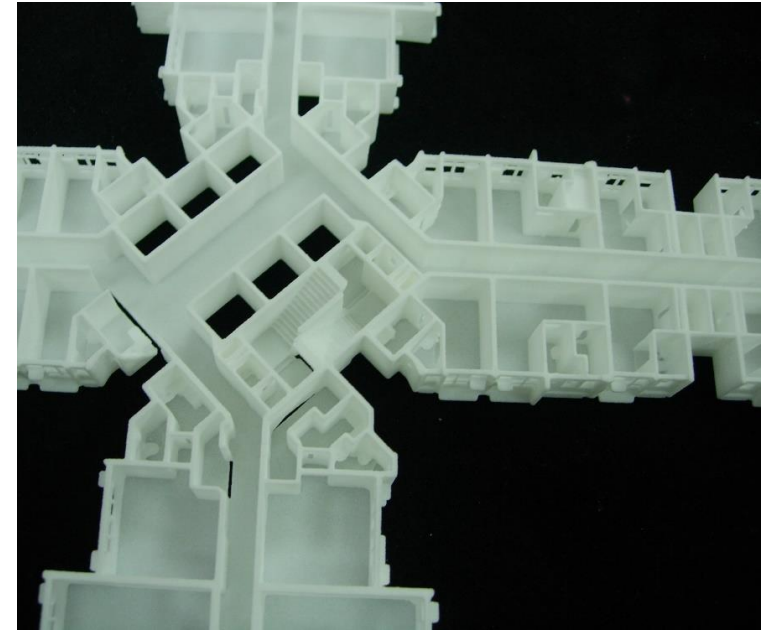
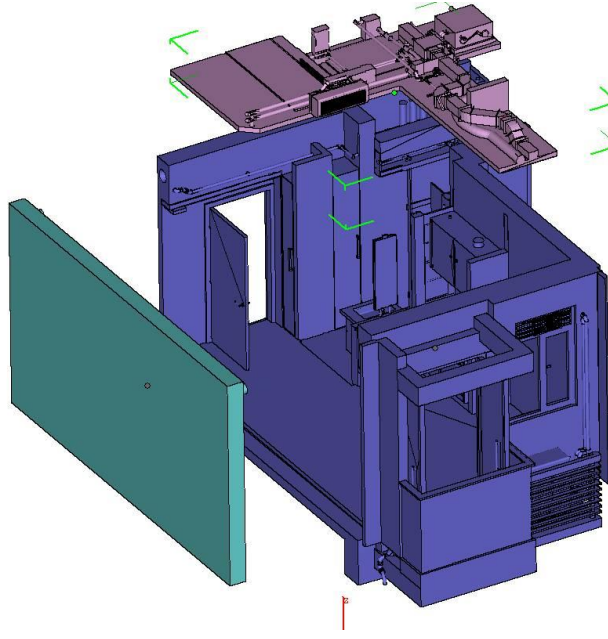


Room Schedule						
Number	Area	Volume	Occupancy	Finishes		
				Floor Finish	Wall Finish	Ceiling Finish
5	115.37 SF	1673 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
6	1988.39 SF	28933 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Circulation: 2						
	2103.76 SF					
10	436.32 SF	6327 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
11	313.14 SF	4541 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
14	388.36 SF	5196 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
15	390.66 SF	5985 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
17	235.44 SF	3414 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
18	235.44 SF	3414 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'
21	255.59 SF	3951 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
22	235.44 SF	3414 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
25	268.48 SF	3993 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
26	262.69 SF	3909 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'
Office: 10						
	2961.54 SF					
28	193.44 SF	2805 CF	Office	Ceramic Tile	N/A	Acoustic Tile 2'x2'
Open Work Area: 1						
	193.44 SF					
25	293.53 SF	4256 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
19	163.62 SF	2372 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
20	142.97 SF	2073 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
13	165.27 SF	2388 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
24	161.86 SF	2347 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'
Reception: 5						
	927.36 SF					
6	98.20 SF	945 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
7	311.76 SF	4521 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
8	312.28 SF	4528 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
9	53.79 SF	780 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'
Services: 4						
	736.13 SF					
0	108.14 SF	1568 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
3	79.04 SF	1146 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'
Storage: 2						
	187.18 SF					



Mock-Up Room



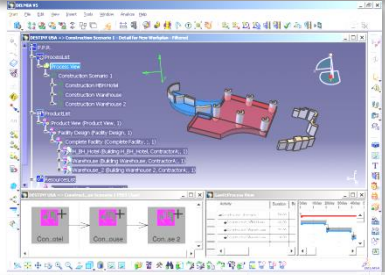


3D Printing for Typical Flat

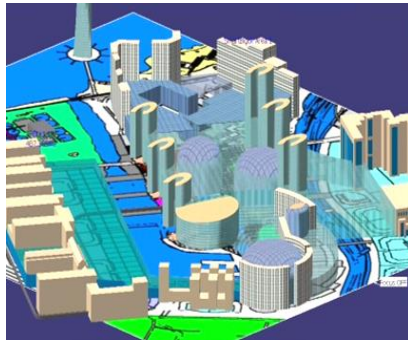
DFMA Construction and Validation



Project Planning

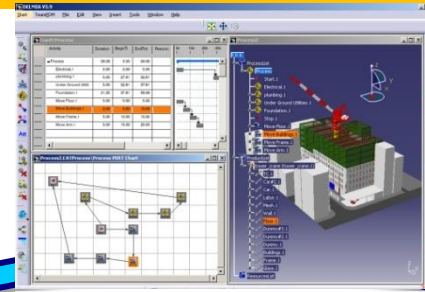


Construction Planning



BIM Models

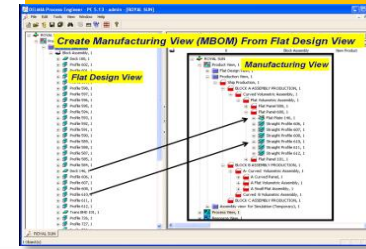
Validation & Cost Estimation



4D Process Validation

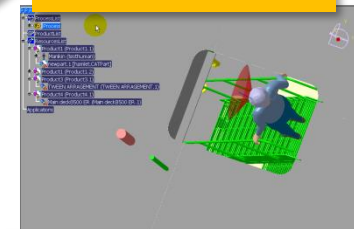


Construction BOM



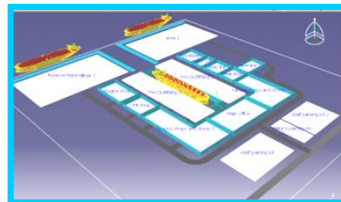
WBS synchronized with design & geometry

Human Factors



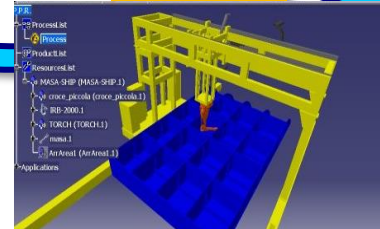
Ergonomics & Safety

Lean Build Strategy



Work package creation

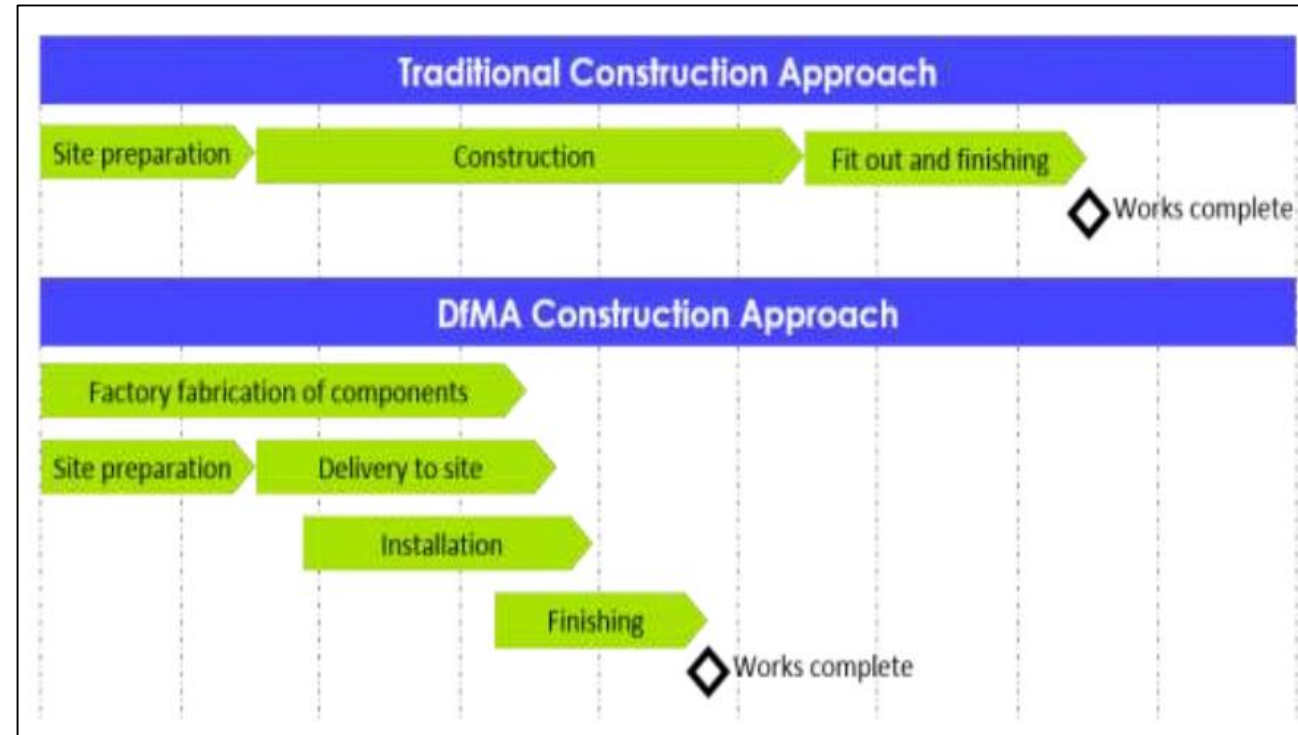
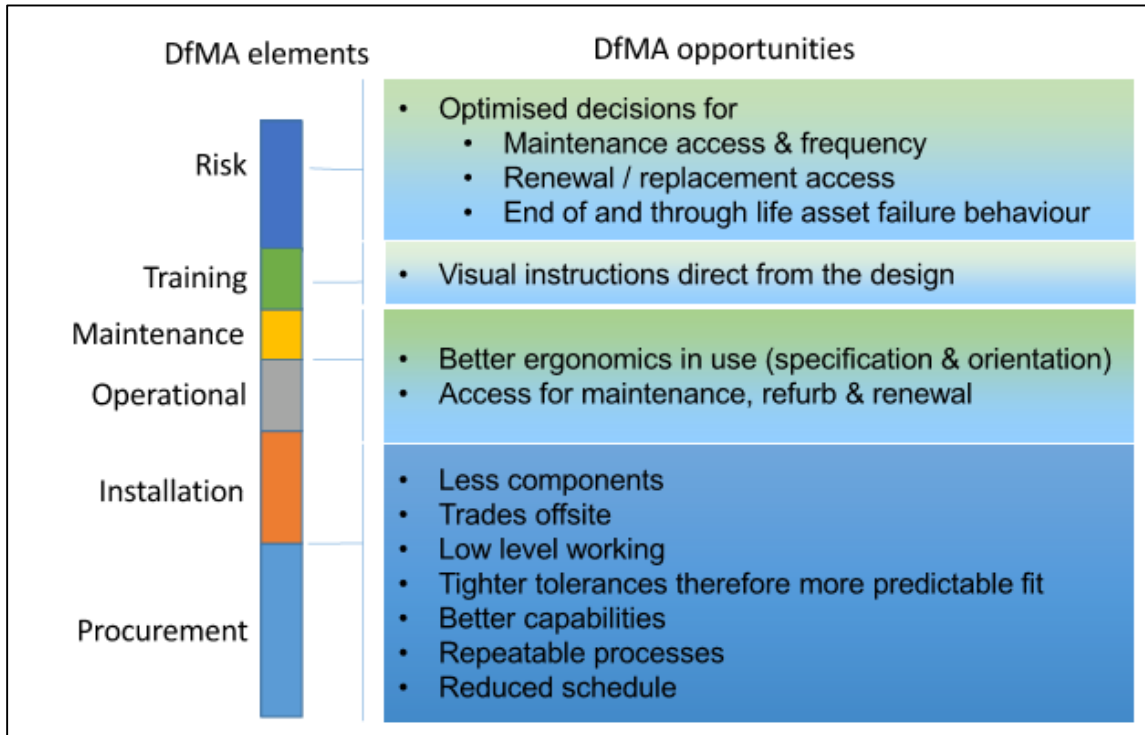
Robotics



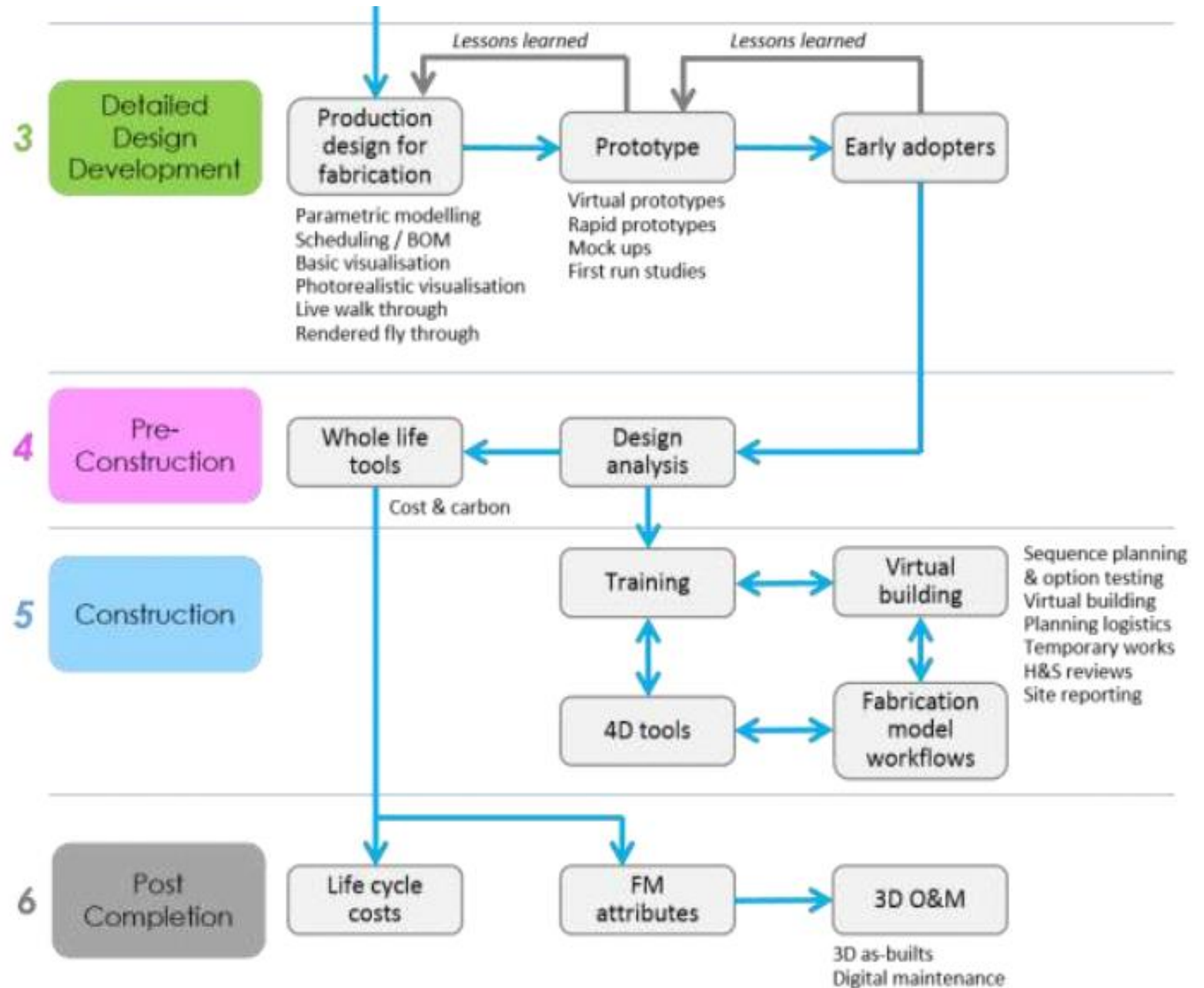
Device Building & Robotics arm in construction



DfMA Construction Approach

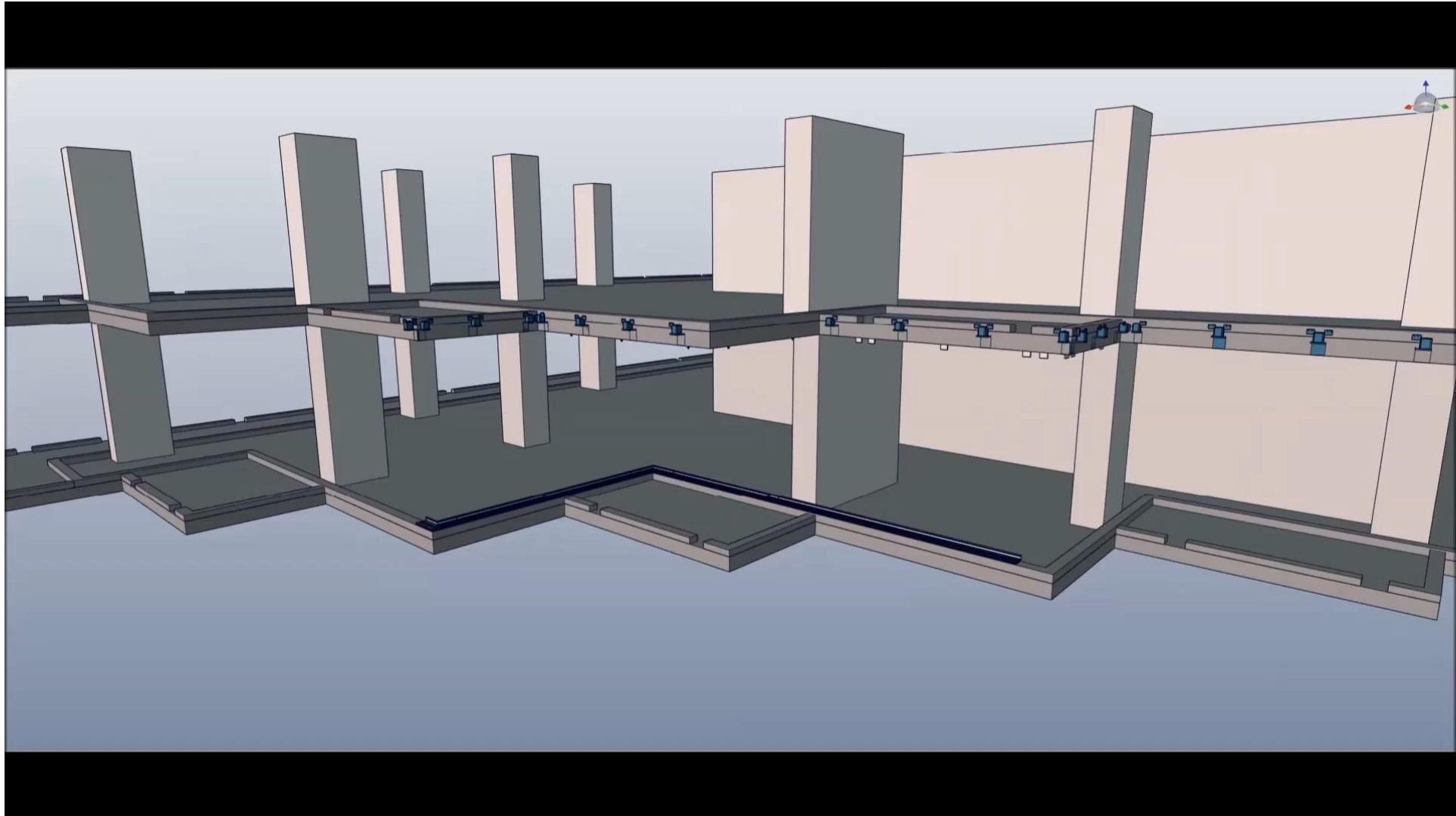


MIC process from manufacturing to construction



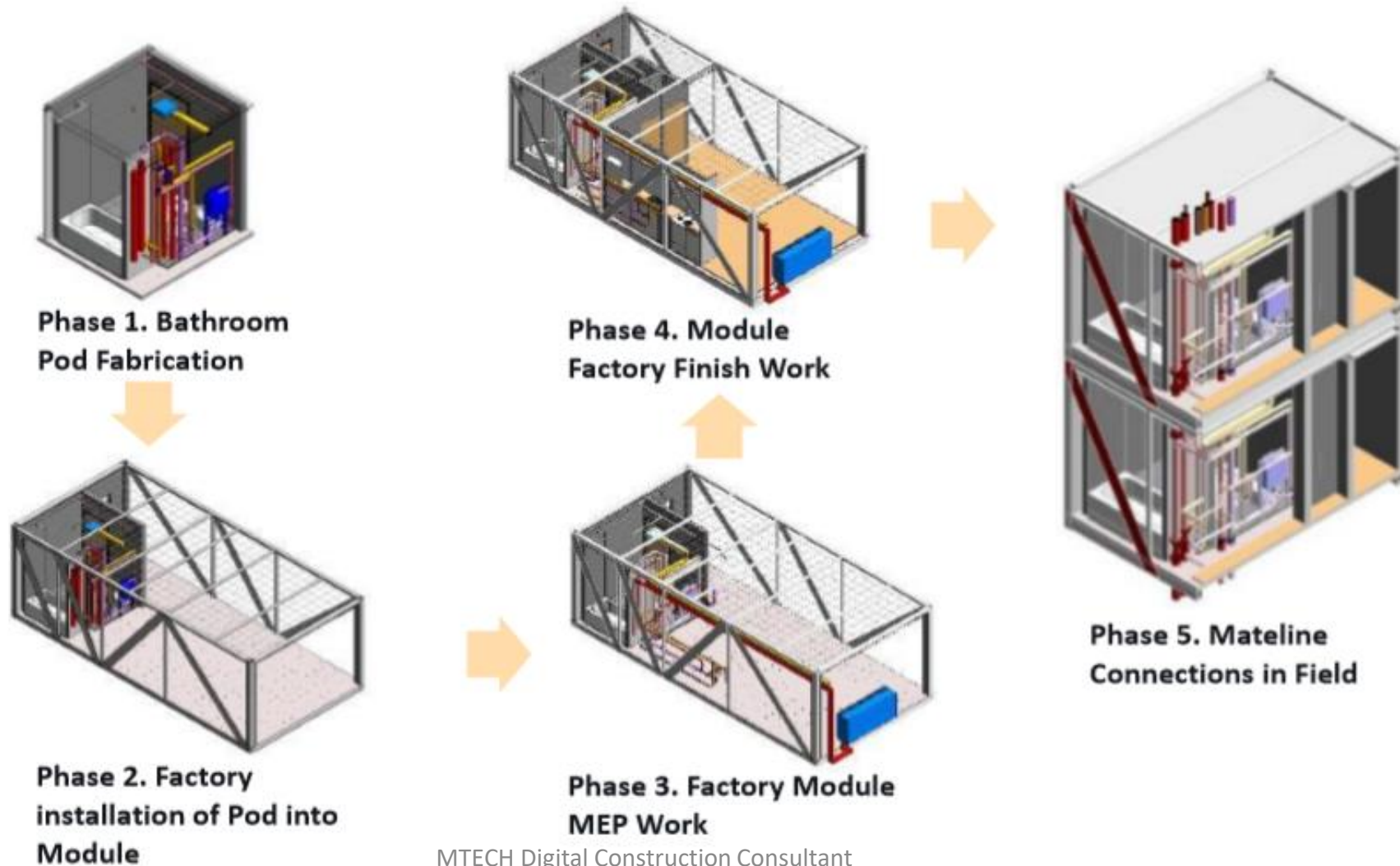


3D Method Statement



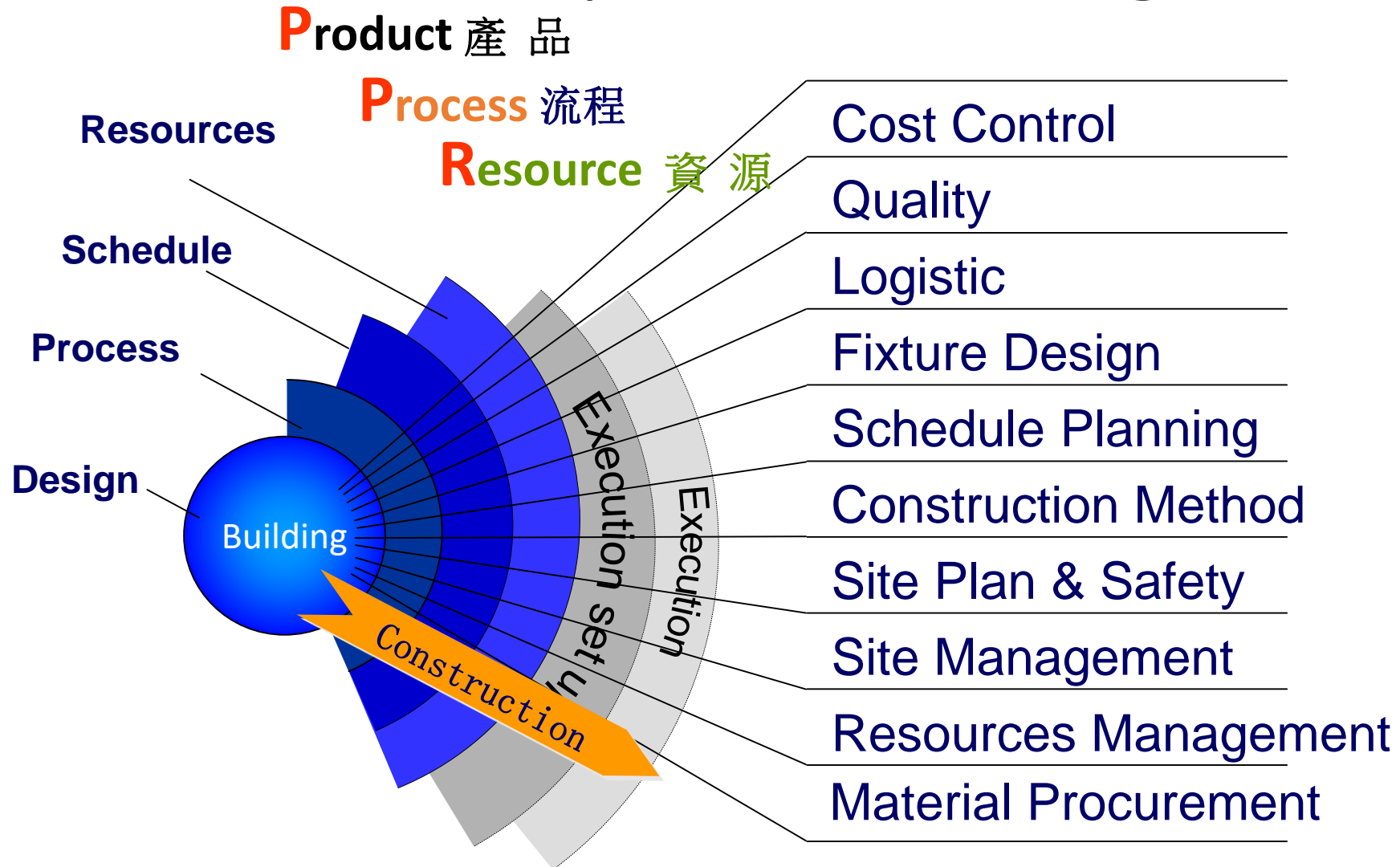


From Manufacturing to Construction



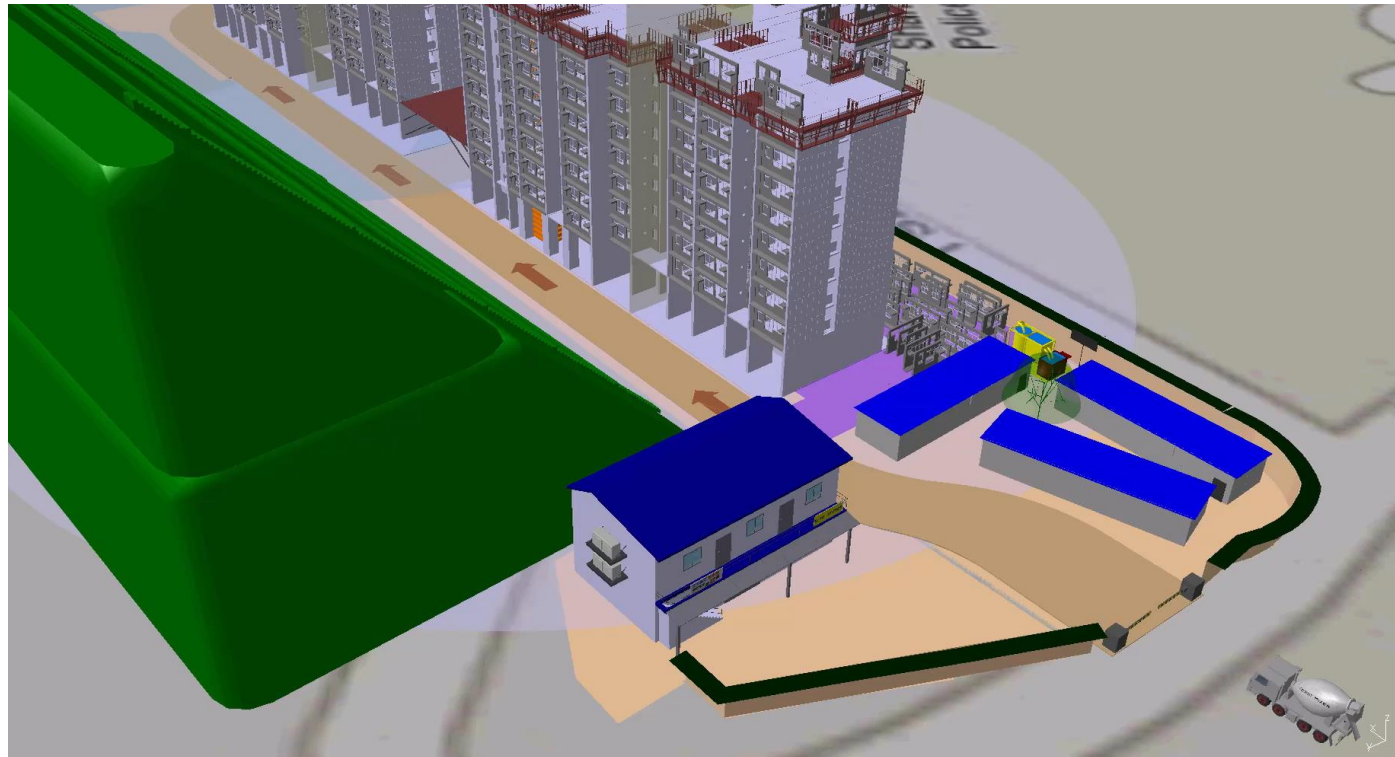


Construction Sequence Planning





Logistic Simulation for Construction Site Layout Planning





Simulation of the 6-day Cycle





3D Training

Pre-cast water tank

files:///C:/Users/user/Desktop/1 Bk/Cortona/Water tank/201 10/21 precast water tank Cortona II file Vb/precast water tank Cortona II file Vb/Pre-cast water tank

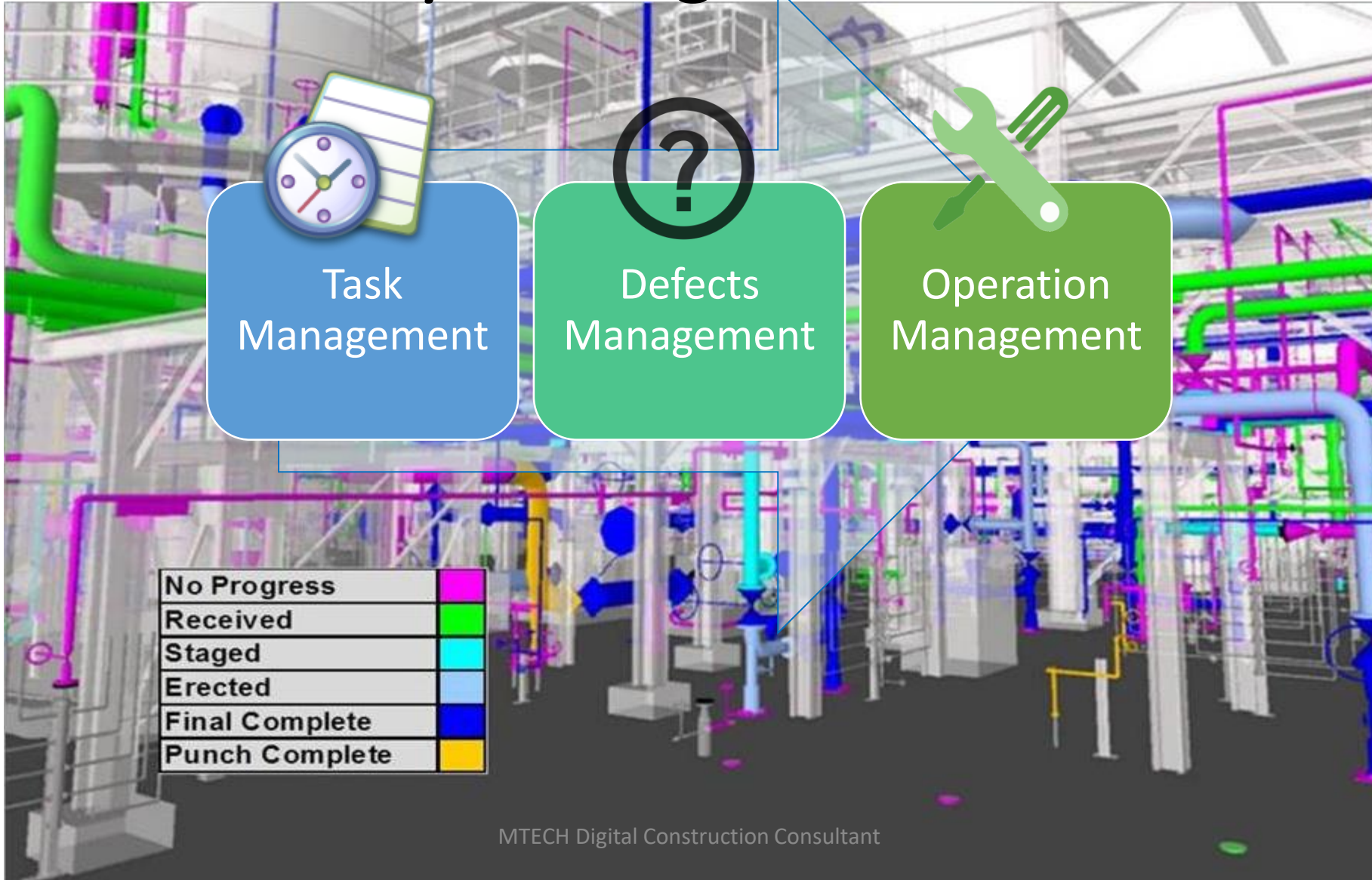
Pre-cast water tank

- 1 Precast water tank location plan
 - 1.1 Precast yard
 - 1.2 Lifting area and safety zone
 - 1.3 RR location
 - 1.4 Compressed soil
 - 1.5 Finish-off area
 - 1.6 Water tank positioning
 - 1.7 Precast water tank location plan
 - 1.8 Type of the precast water tank
 - 1.9 Weight of the water tank
- 2 Pre cast water tank preview
 - 2.1 3D water tank
 - 2.2 3D water tank
- 3 Water tank floor slab and wall construction
 - 3.1 Formwork
 - 3.1.1 Outer plywood based erection
 - 3.1.2 Plywood board support
 - 3.1.3 First layer of formwork erection at outer side
 - 3.1.4 Centre to centre: 300mm max.
 - 3.1.5 Second layer of formwork erection at outer side
 - 3.1.6 From bottom to the first wooden block is 300mm max, and then 70mm centre to centre
 - 3.1.7 Puddle flange preview
 - 3.1.8 Puddle flange fixing
 - 3.1.9 Re-bar fixing to the water tank base

Play Pause Stop Autostop Messages Freeze Viewpoint Speed: x1/2 x1 x2



Total Quality Management





TQM – Construction vs Manufacturing

Construction

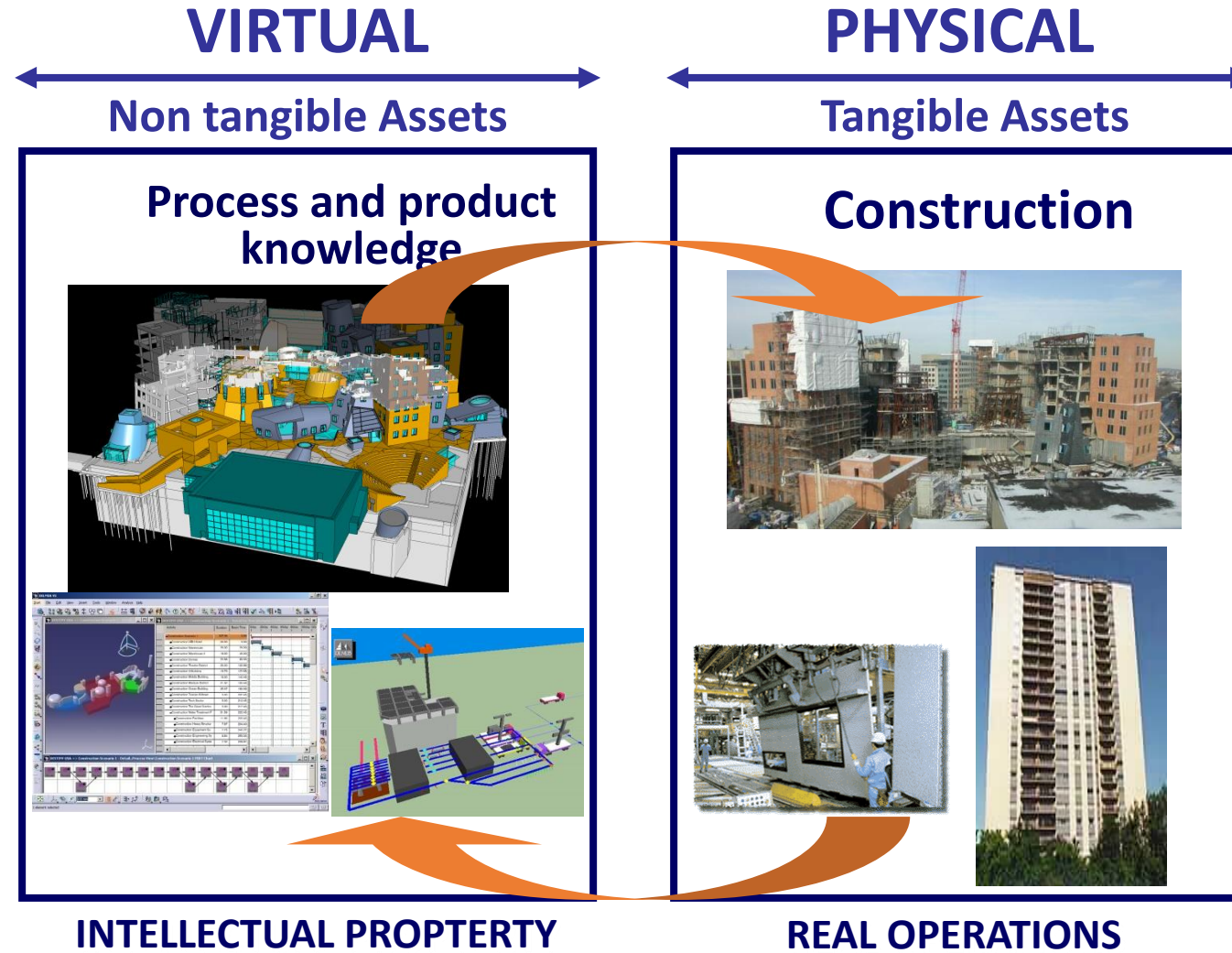
- Passive - On request
- Partial
- Repair
- On site
- Cost oriented
- Customer acceptance

Manufacturing

- Active & Preventive - Self driven
- Total
- Return & replace
- Inhouse
- Competitive advantages
- Customer satisfaction

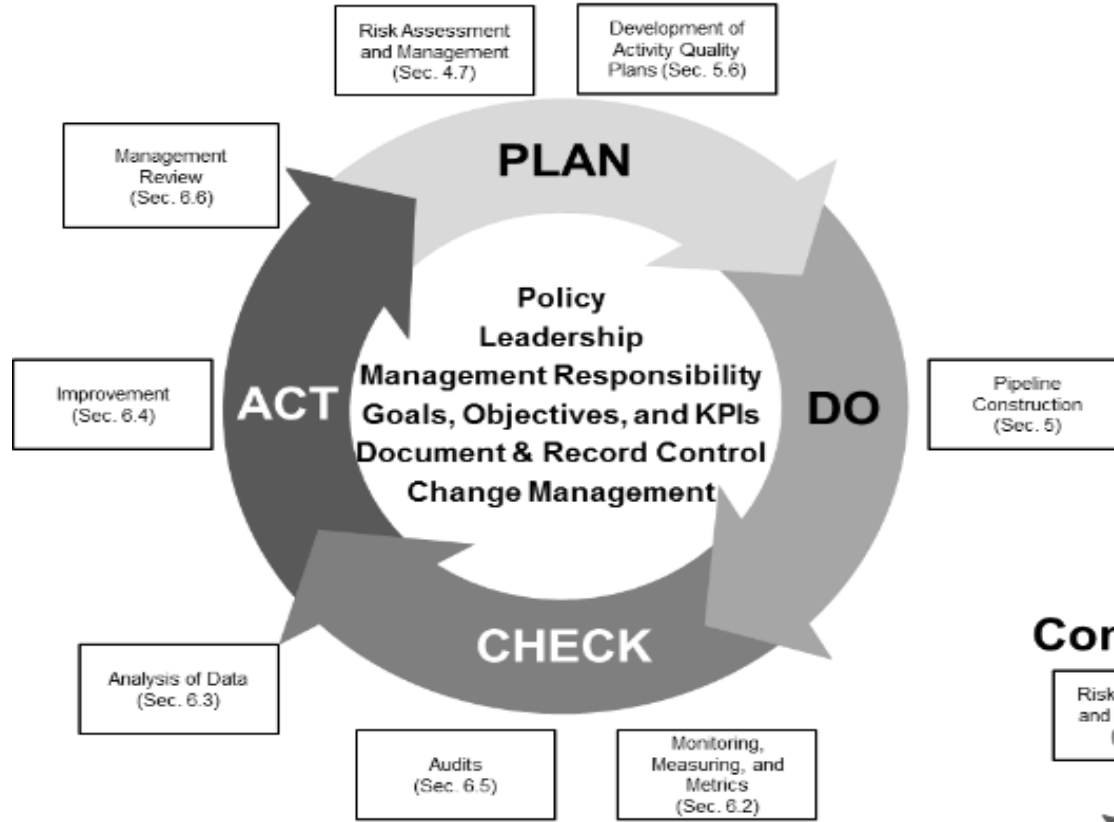


“Define, Plan, Validate, Monitor & Control the Physical world in a Virtual Digital Environment”

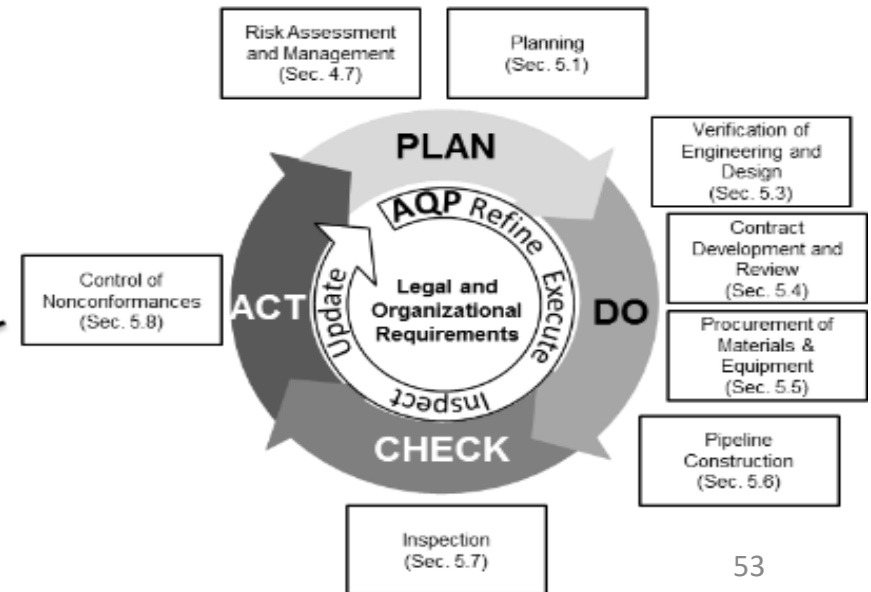


Close Loop Quality Management

Quality Management System

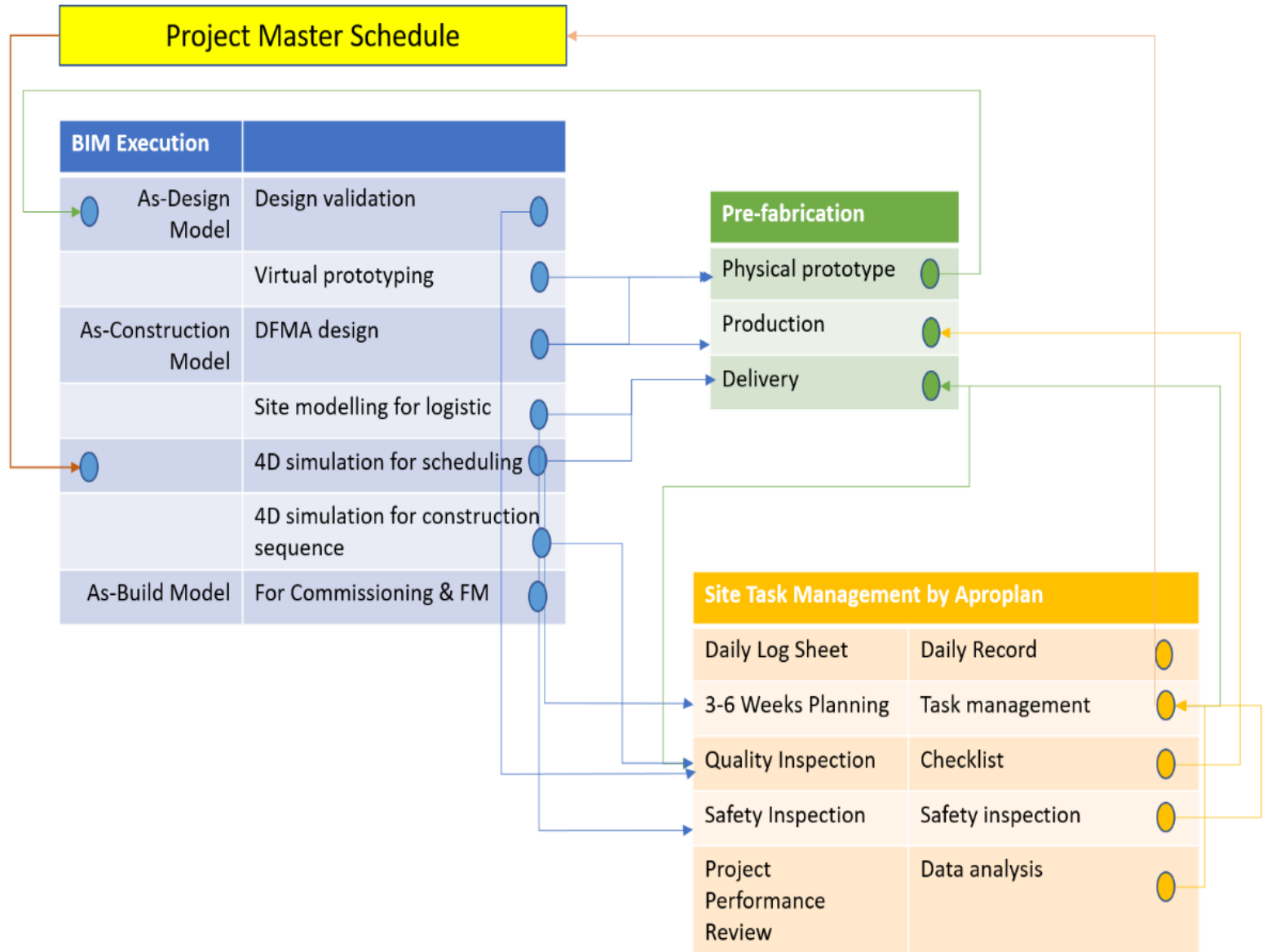


Construction Project



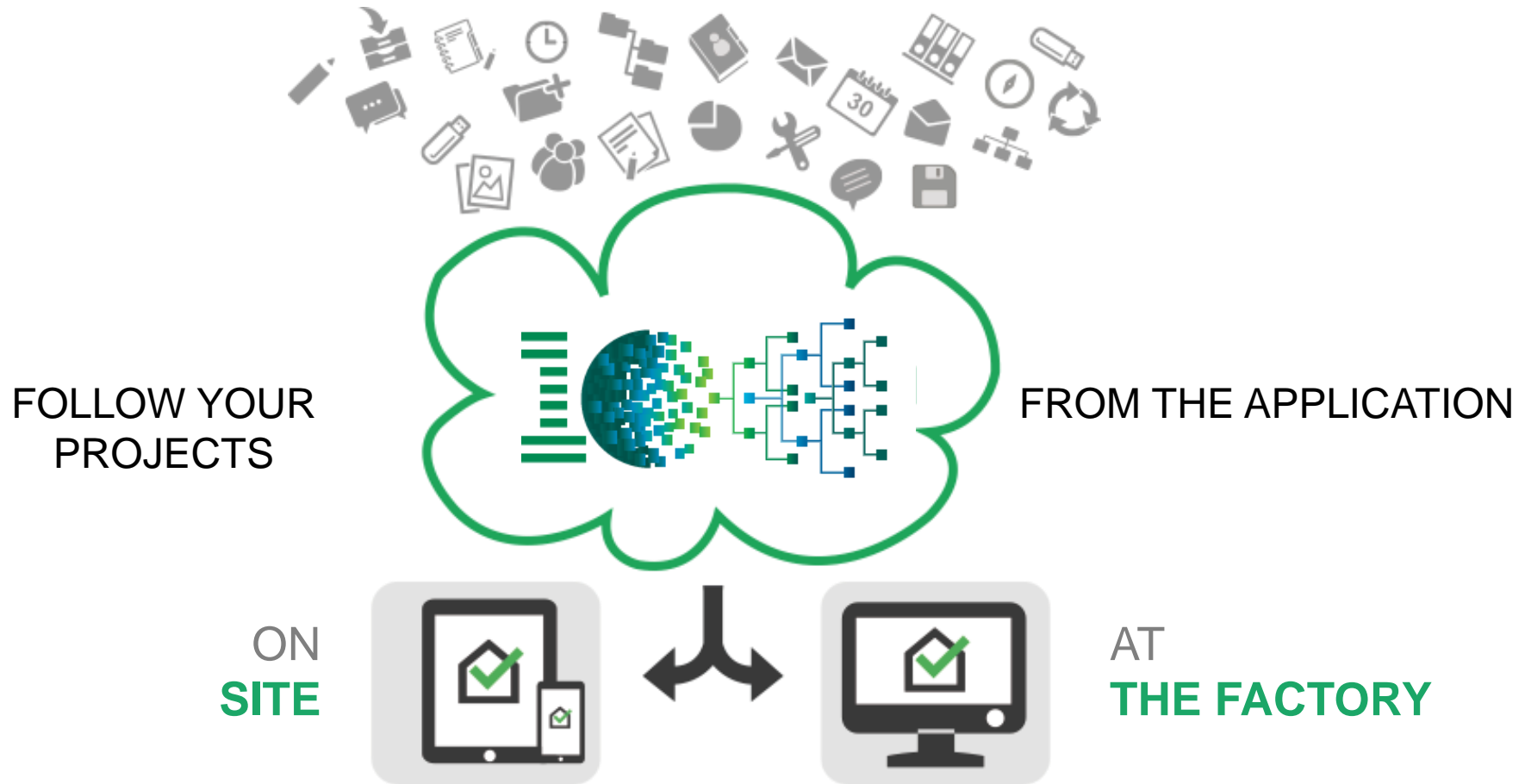


Integrated System





Digital Quality Management System

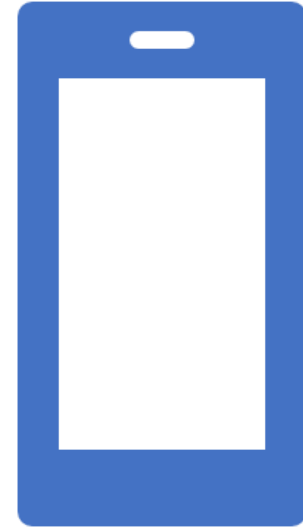




Between Site & Factory – Virtual vs Physical

- DALUX BIM VIEWER
- Platform for Everyone to access Model on Mobile Device

- DEMONSTRATION



DALUX BIM VIEWER

Platform for Everyone to access Model on Mobile Device






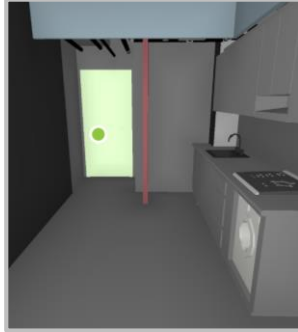
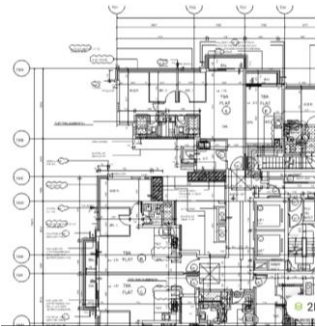
DALUX

DIGITAL TWINS

Create workflows
and tasks with
BIM and AR



Mobile App: DALUX FIELD (Platform for Quality Control & Defect Management)



Crack

Reference Materials

Standard Procedure

Category: Architecture
Defect: Crack
Object: Door
Location: Room A, 1/F
Due Date: Nov 01, 2019
Urgency: Middle

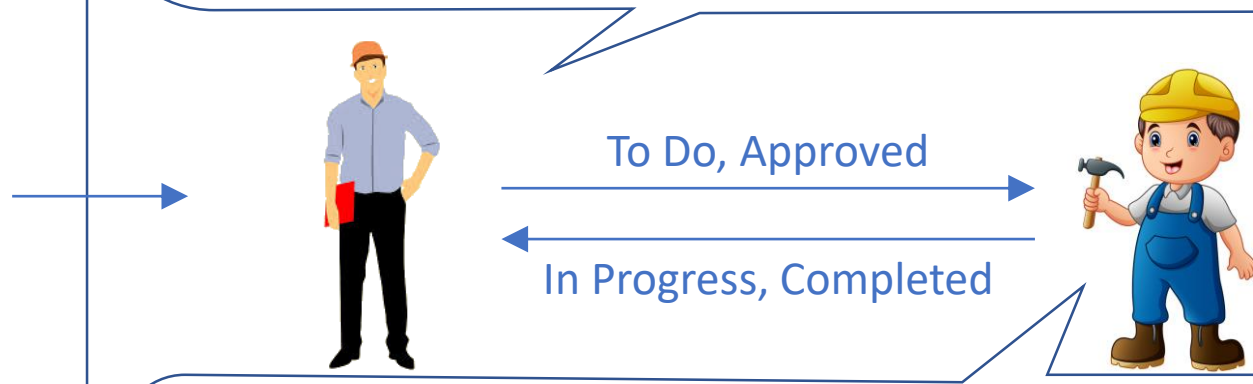



Photo (In Progress)



Crack

Photo (Completed)



Crack

Request for Information
How to install?
How to correct?
What Procedure?

All You need to know about the DALUX FIELD (Platform for Quality Control & Defect Management)

DALUX FIELD

Platform for Quality Control & Defect Management





Project Execution & Control

DALUX FIELD

Platform for Quality Control & Defect Management

REPORTS, DASHBOARD AND ANALYSIS

DF27 Door - Fire Insulation Materials

 Reopen |
  Print |
  More ▾

Jul 19 2019, 11:27 AM
 Assigned to MTECH Engineering Co.,Ltd.

Created by:	Thomas Leung, MTECH Engineering Co.,Ltd.
Substitute for:	MTECH Service, MTECH Engineering Co.,Ltd.
Assignee:	Thomas Leung, MTECH Engineering Co.,Ltd.
Title:	Door - Fire Insulation Materials



1.1, 2019-07-19, 11.24

Jul 19 2019, 11:35 AM
 Assigned to MTECH Engineering Co.,Ltd.

Updated by:	Thomas Leung, MTECH Engineering Co.,Ltd.
New assignee:	MTECH Service, MTECH Engineering Co.,Ltd.
Work package:	MTECH Construction Site - MEP Installation/Commissioning (HVAC) → Quality Control
Workflow:	Team B → Total Quality Management

Jul 19 2019, 11:37 AM

Updated by:	MTECH Service, MTECH Engineering Co.,Ltd.
Description:	是否欠缺防火條，請指示安裝位置

Jul 19 2019, 11:38 AM

Updated by:	Thomas Leung, MTECH Engineering Co.,Ltd.
-------------	--

DF27 Door - Fire Insulation Materials

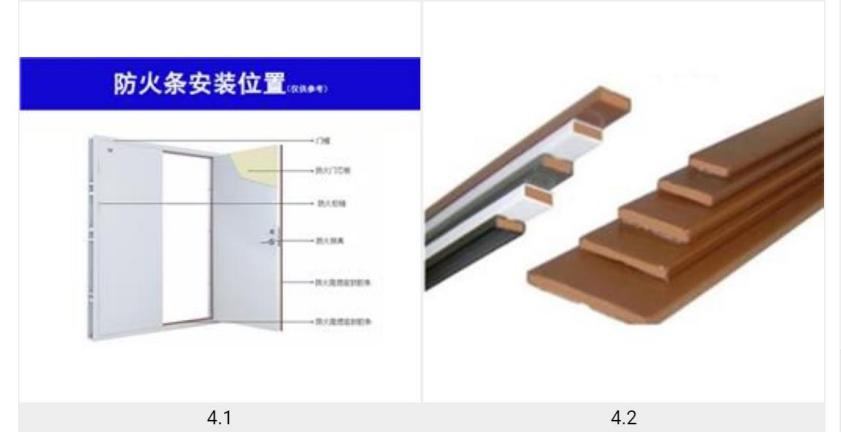
 Reopen |
  Print |
  More ▾

Jul 19 2019, 11:37 AM

Updated by:	MTECH Service, MTECH Engineering Co.,Ltd.
Description:	是否欠缺防火條，請指示安裝位置

Jul 19 2019, 11:38 AM

Updated by:	Thomas Leung, MTECH Engineering Co.,Ltd.
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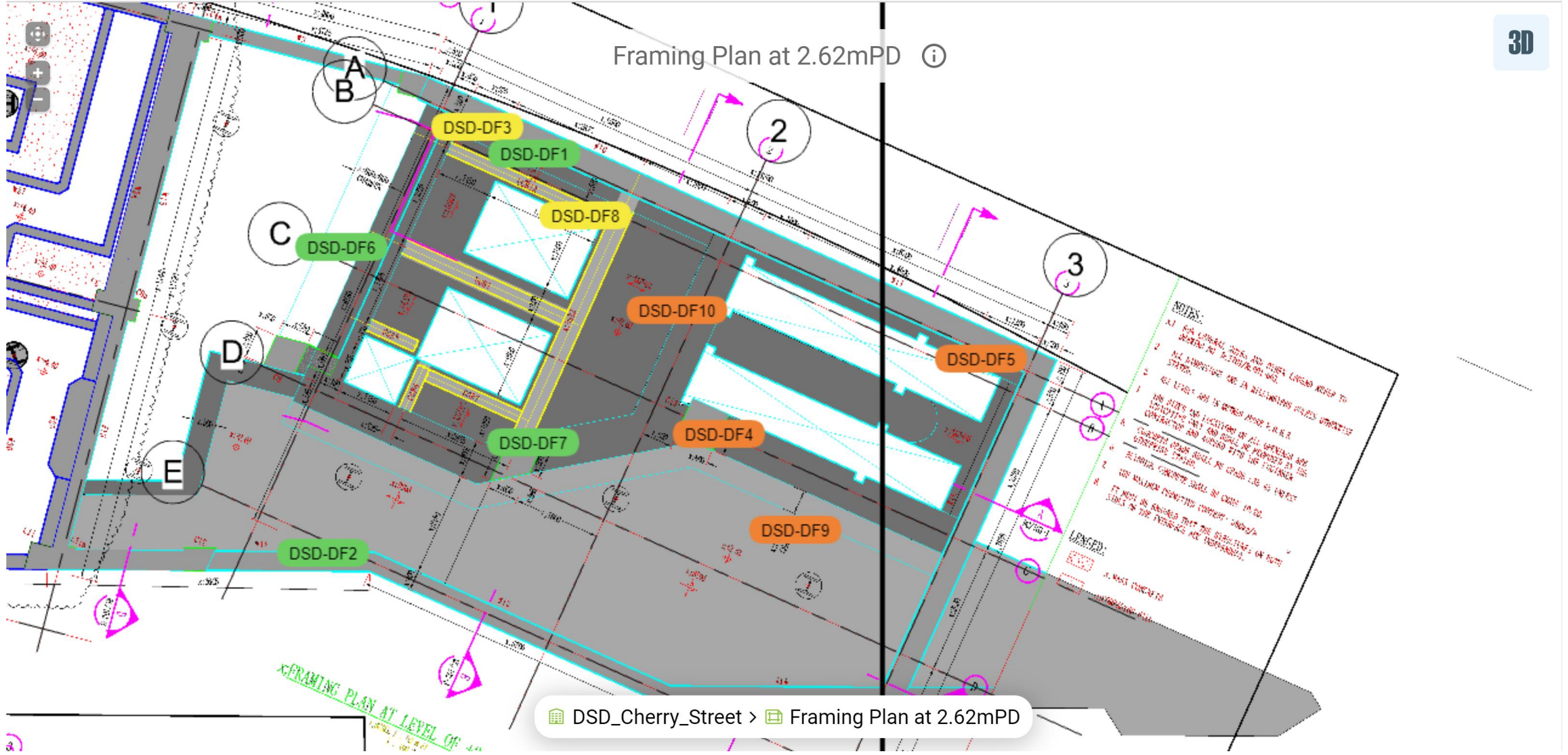
Jul 19 2019, 11:40 AM

Updated by:	Thomas Leung, MTECH Engineering Co.,Ltd.
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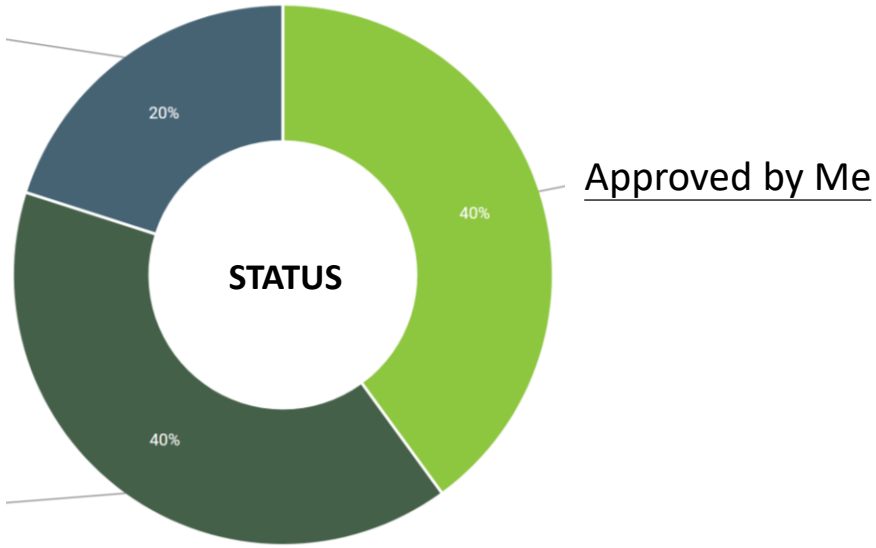


Jul 19 2019, 11:41 AM

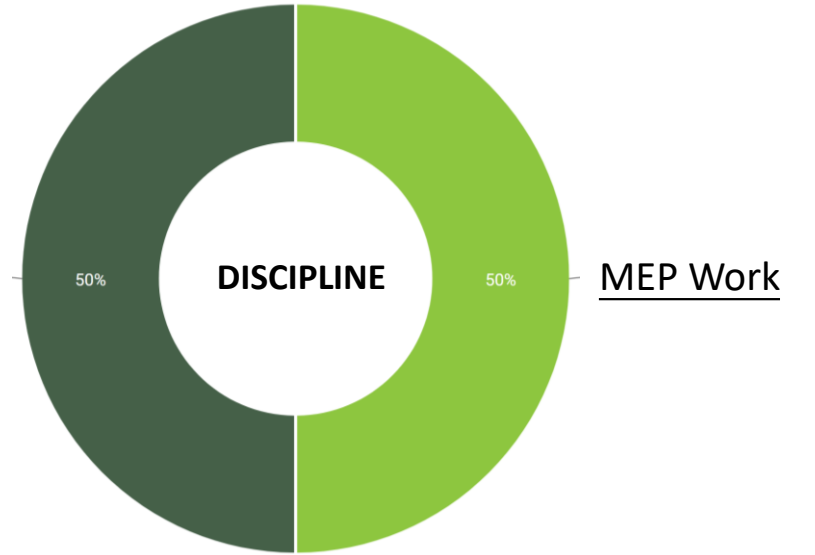
Updated by:	MTECH Service, MTECH Engineering Co.,Ltd.
Description:	我們能提供防火條，名為「火盾防火FS系列」



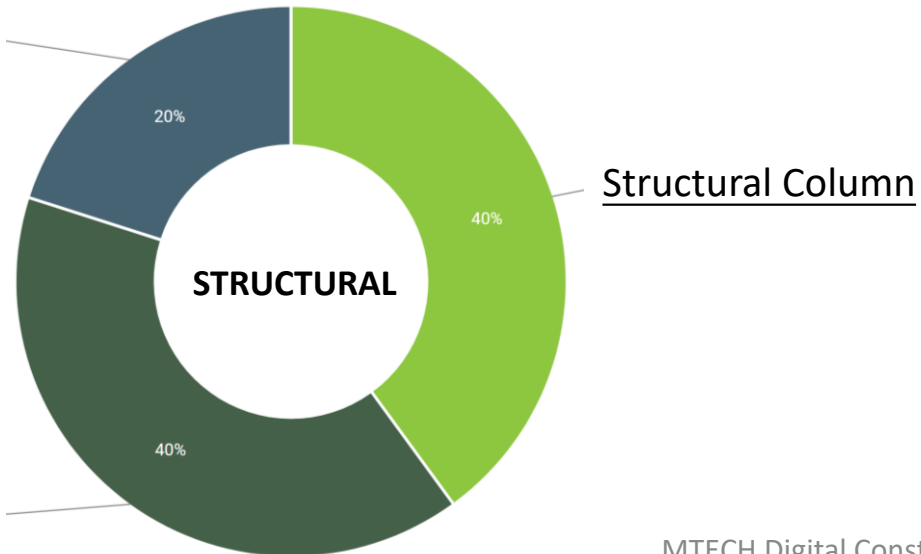
Waiting for My Approval



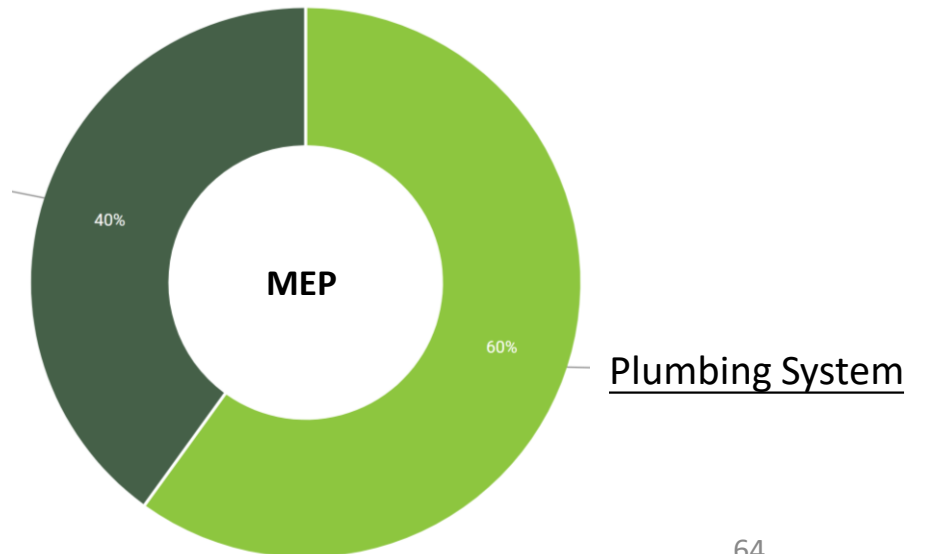
Structural Work



Structure Slab



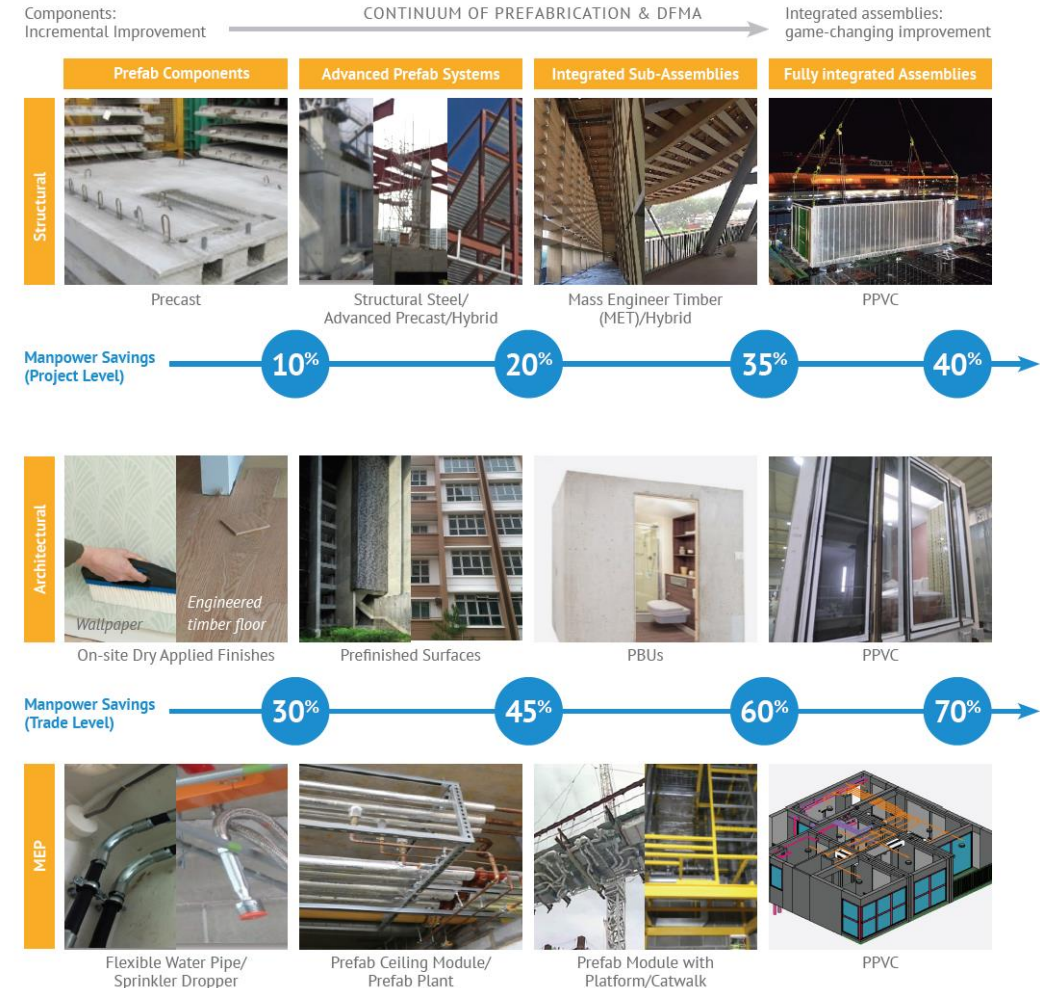
AC System





Digital Construction Deliverables

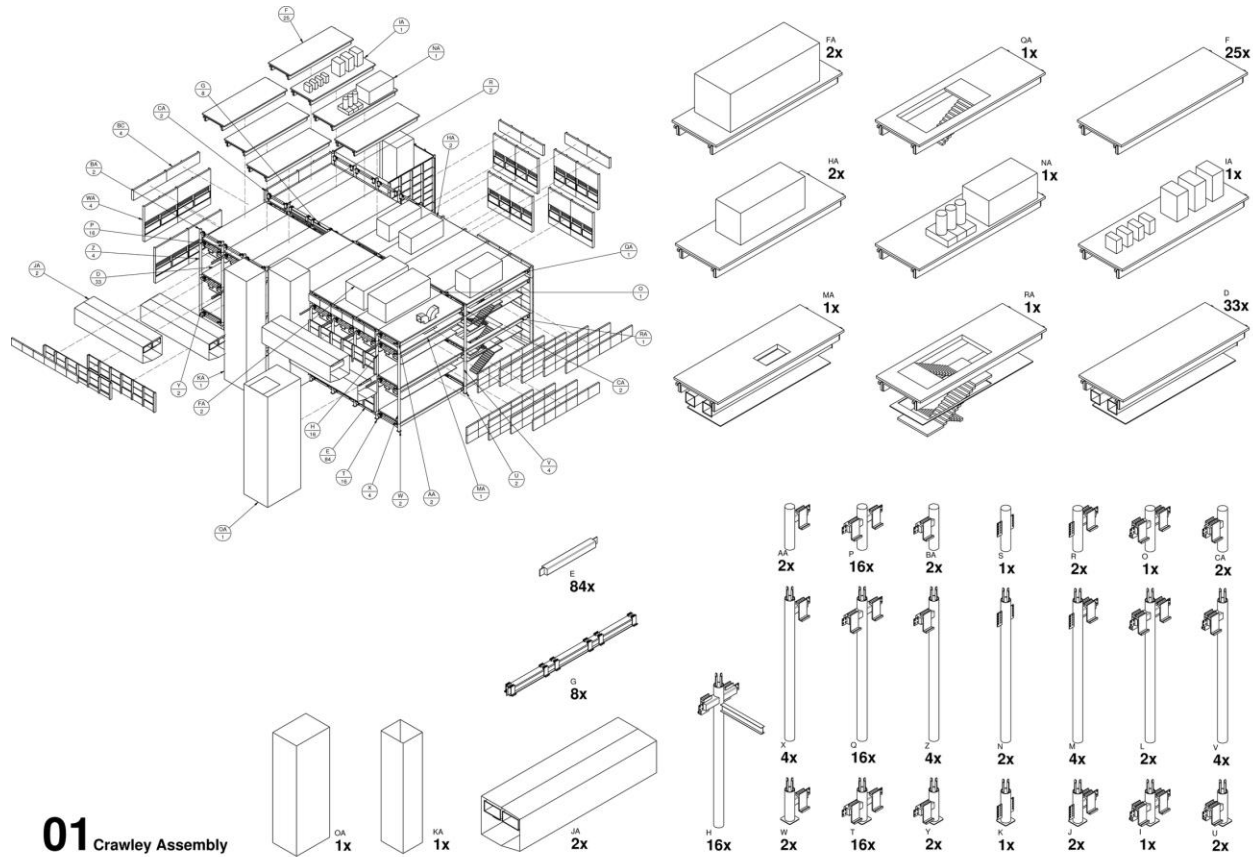
- BIM Project Execution Plan
- As-Design BIM modelling
- Modulus modelling for DFMA
- As-Construction BIM modelling
- 4D Site construction sequence simulation
- Site Walk through simulation
- Project coordination



BIM Deliverables

- Modulus installation - 3D method statement
- Packaging modelling
- Unpacking simulation
- Logistic simulation & analysis
- Quality inspection defect management
- As-Build BIM Model
- Technical BIM training to Project team
 - Digital Construction for MIC (for all project stakeholders)
 - BIM Project Execution Plan (for all project stakeholders)





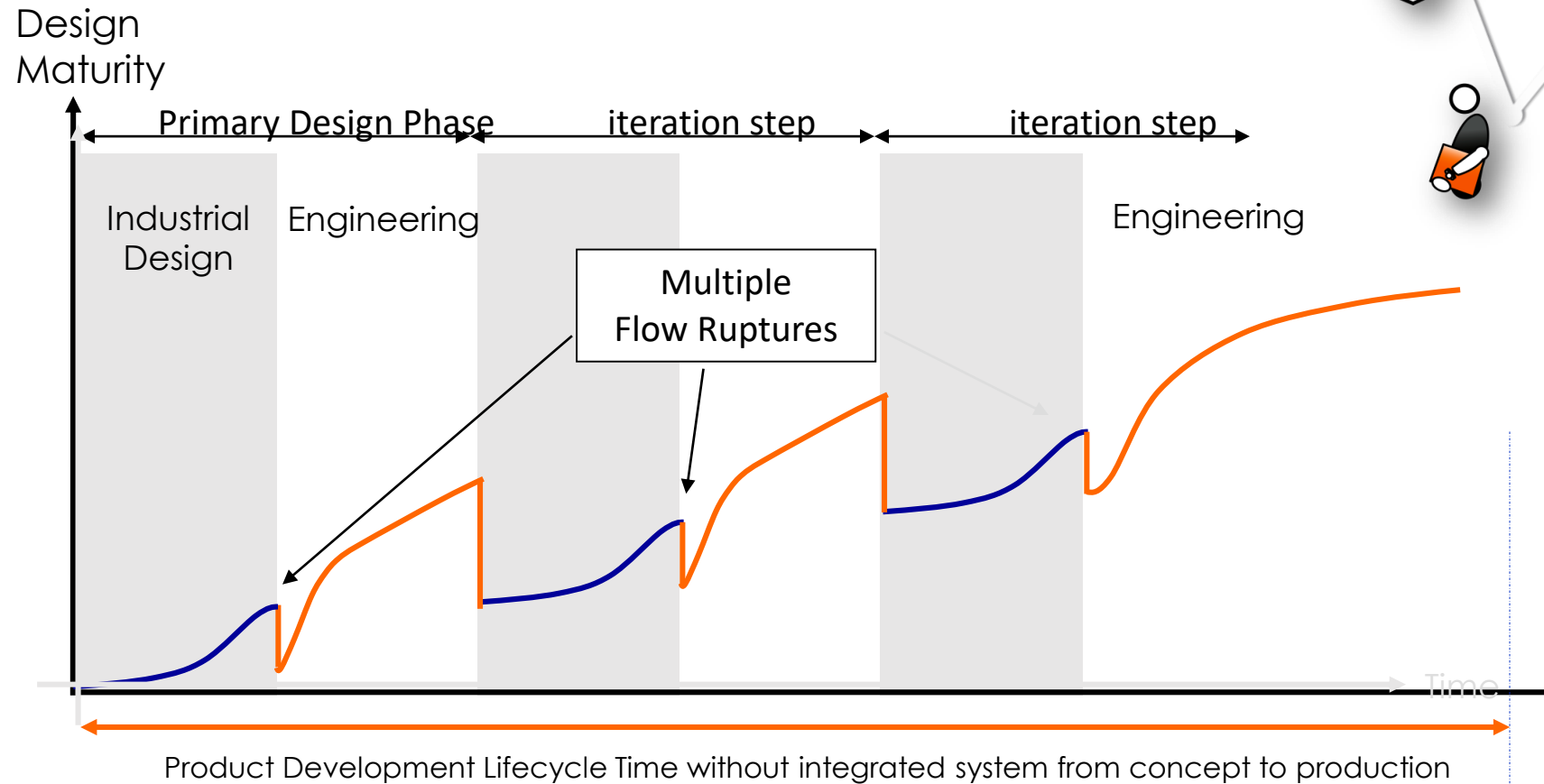
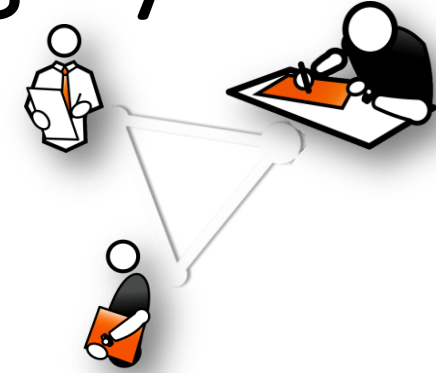
01 Crawley Assembly

Agenda

- MTECH Introduction
- BIM for Building Construction
- Digital Construction for MIC
- **Challenges**
- Conclusion

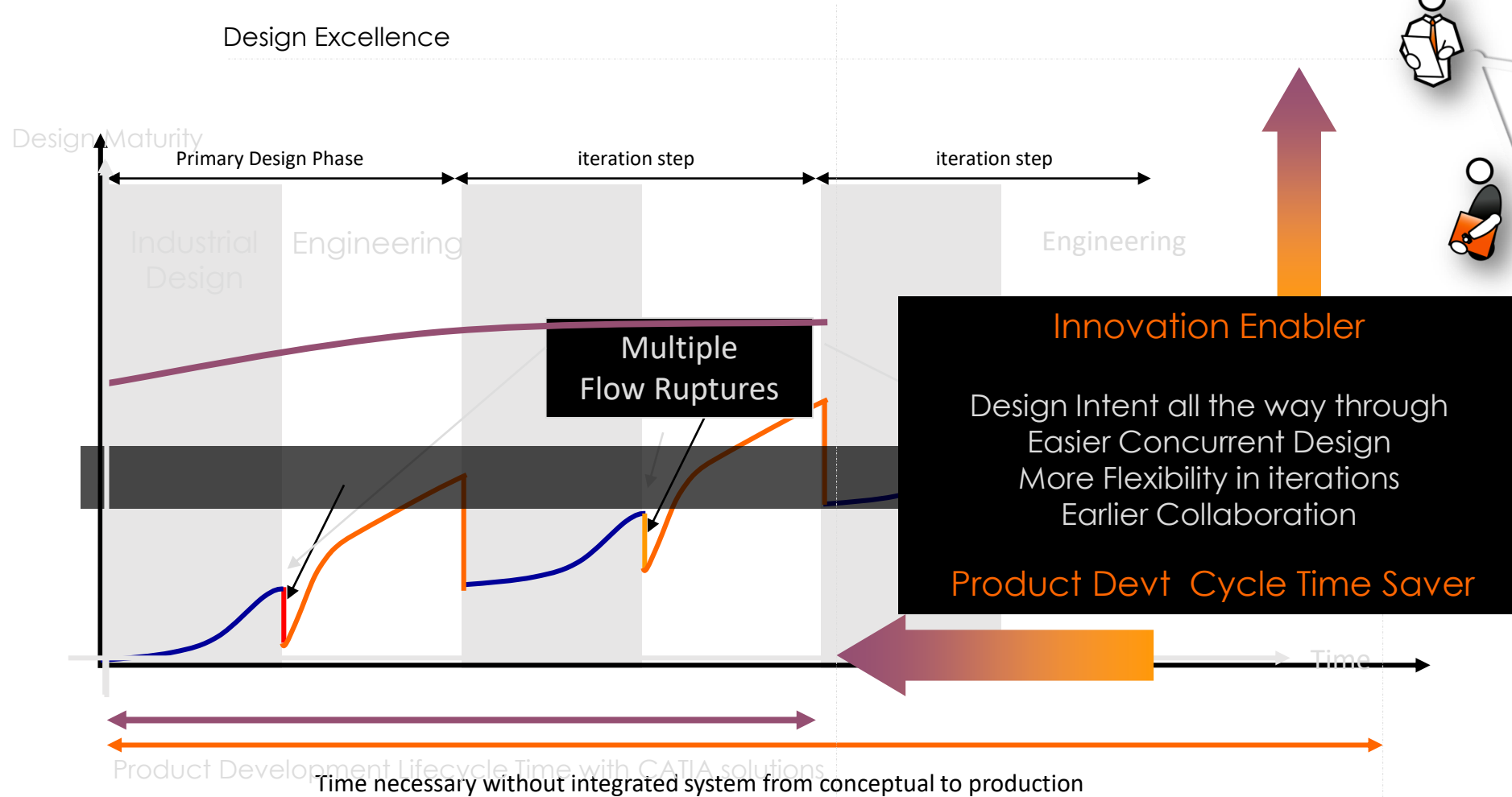


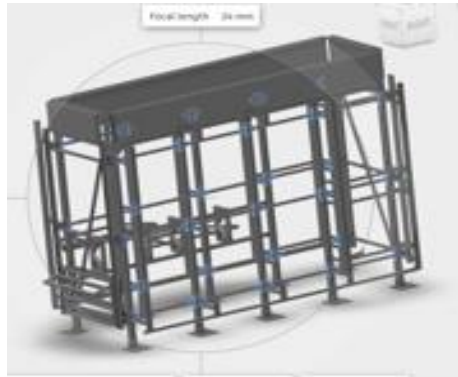
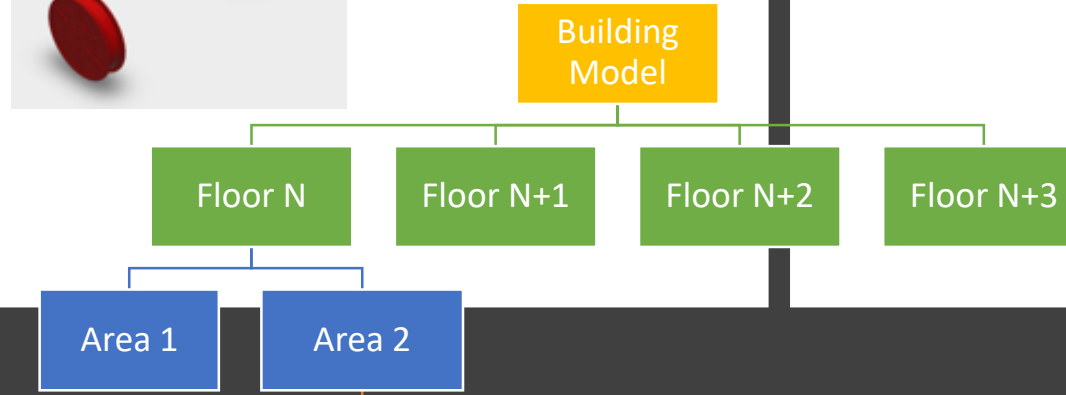
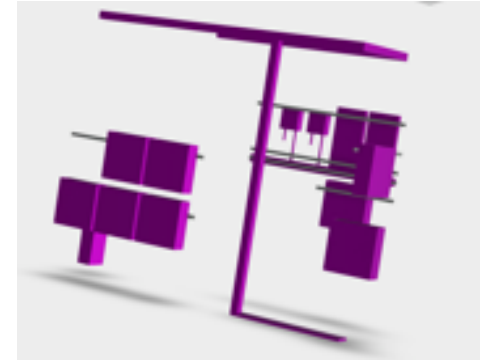
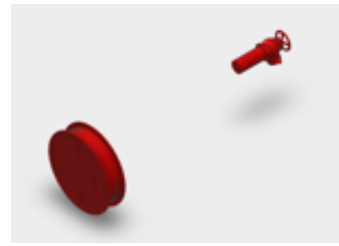
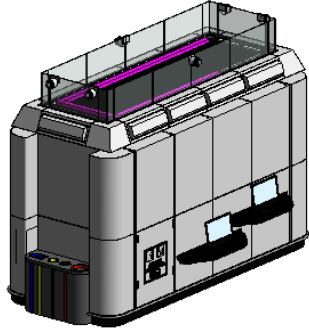
Share, keeping your Design Integrity



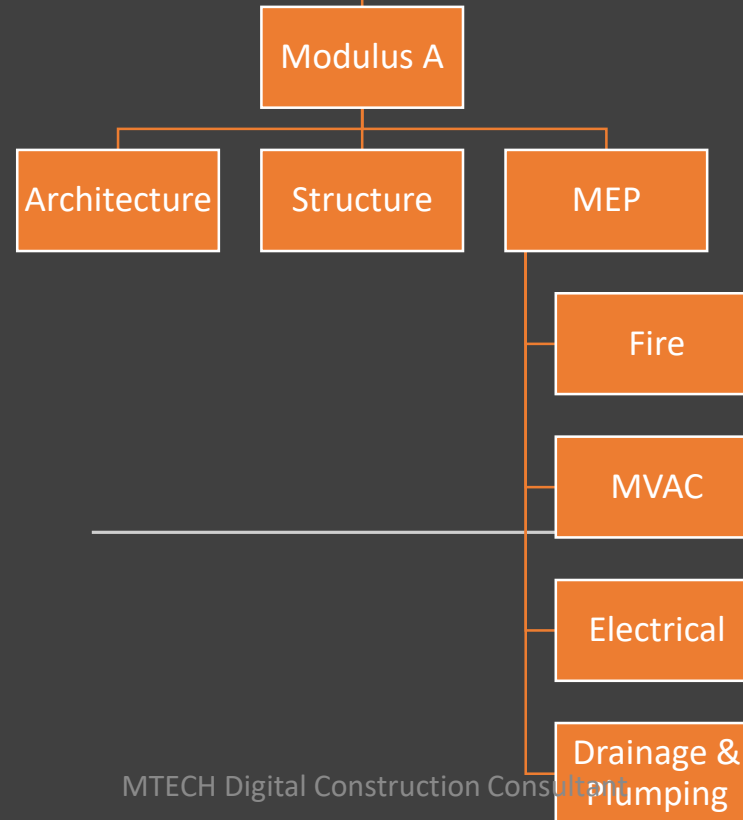


Share, keeping your Design Integrity



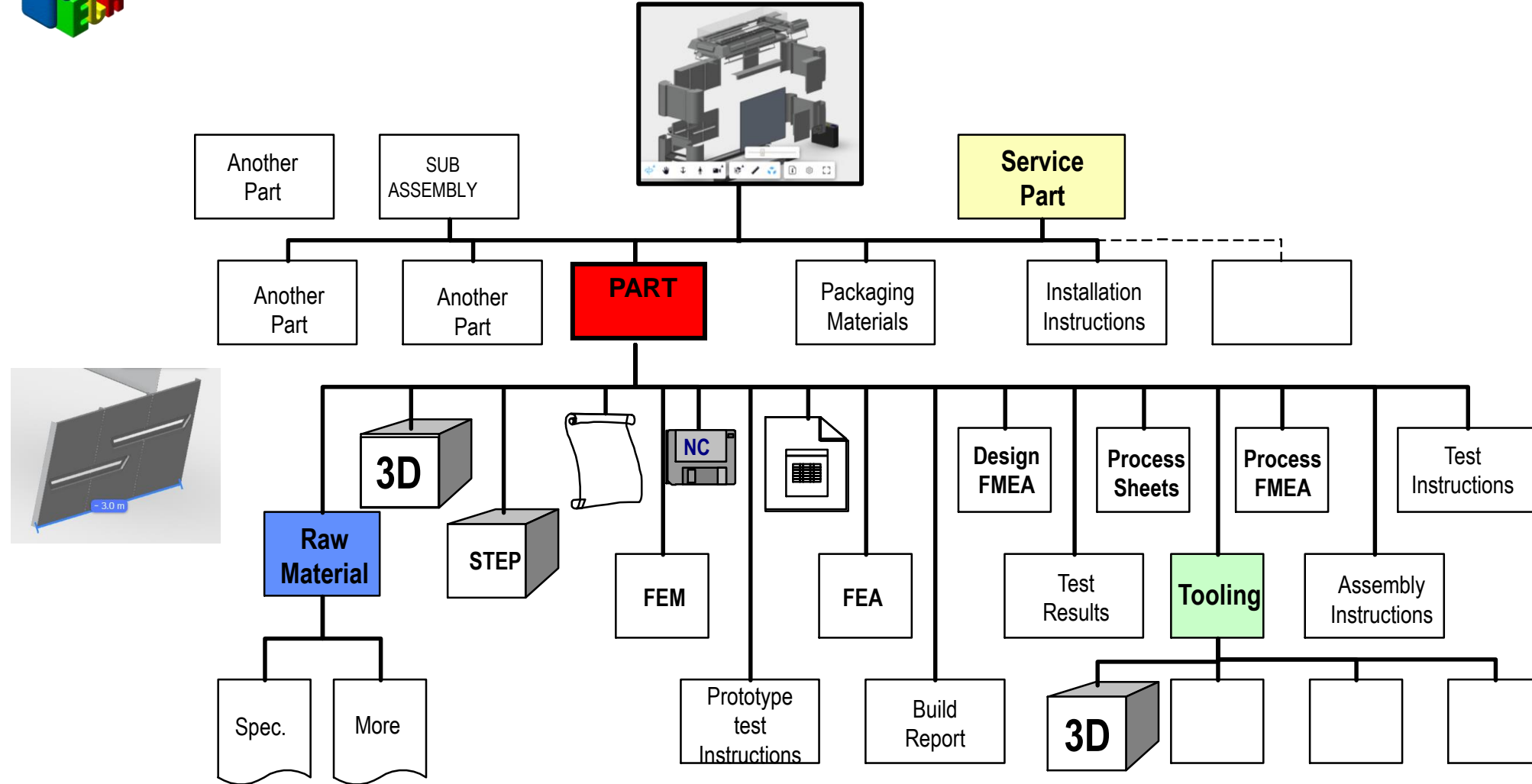


from BIM Model Architecture





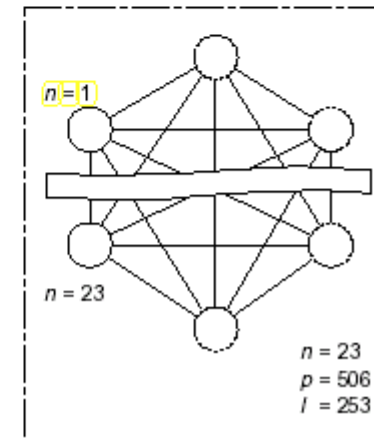
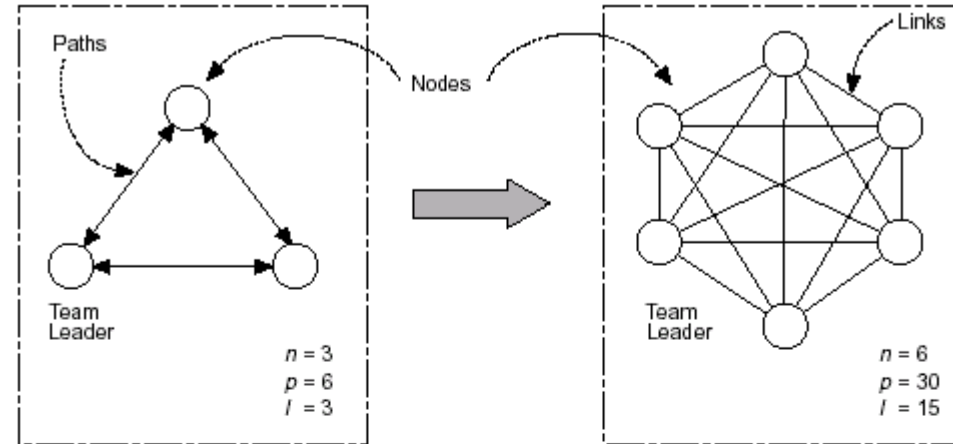
to Variety of Product Information.....





Level of Communication Efforts Required

When the level of decomposition reaches this optimal level, the effort of communication is manageable and, at the same time, the level of complexity is also reduced.

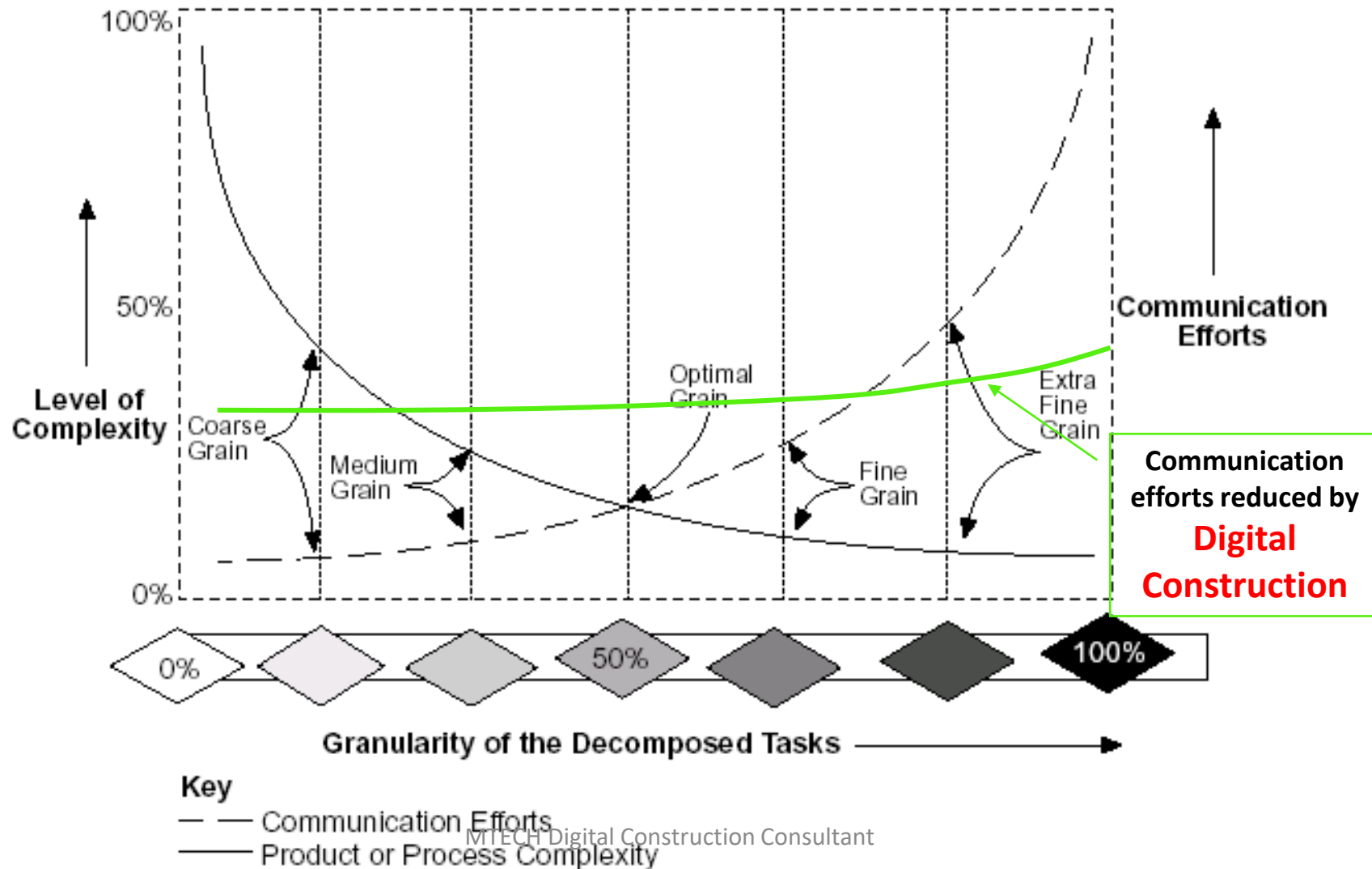


Key
 $p = \text{paths} = (n-1) * n$
 $l = \text{links} = (n-1) * n / 2$
 $n = \text{nodes, also}$
 $n = \text{denotes the number of team leaders}$

Communication effort $\propto [n * (n - 1) / 2]$
 where, n is the number of communication nodes.

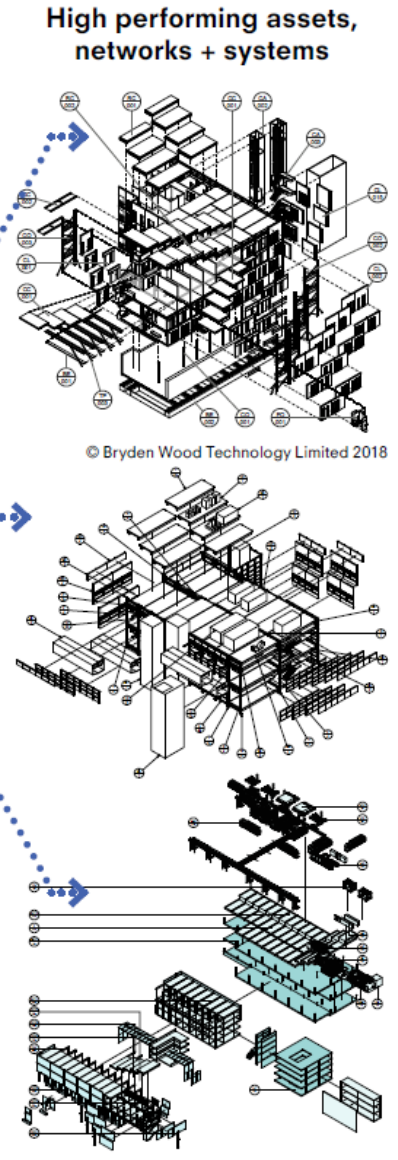
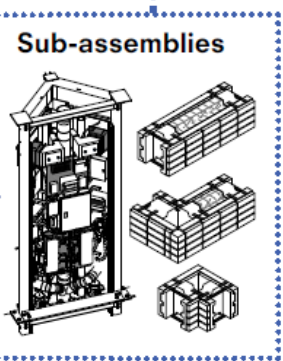
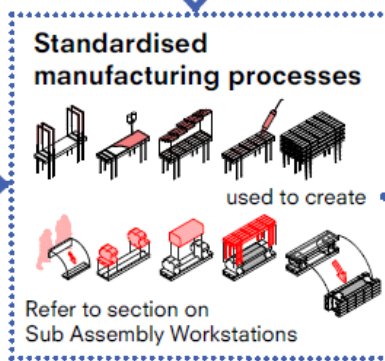
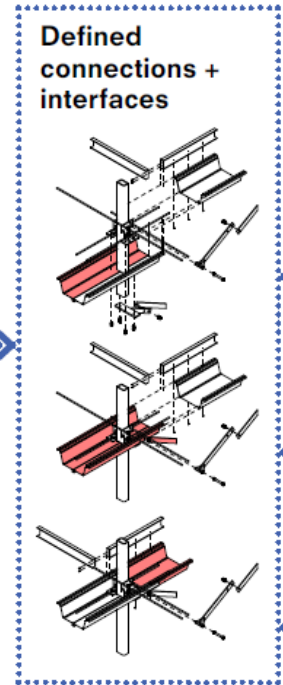
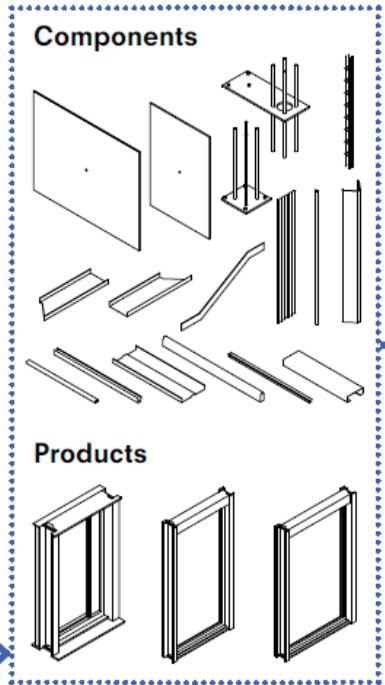
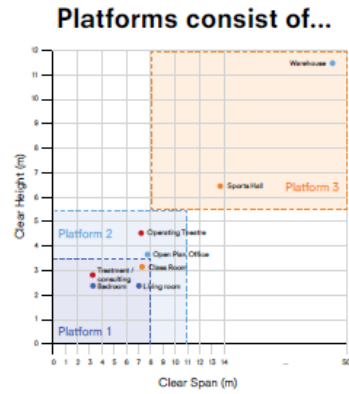


Balance Complexity and Communication Effort



Mass Customization – Master Building Platform

What are Platforms? cont'd





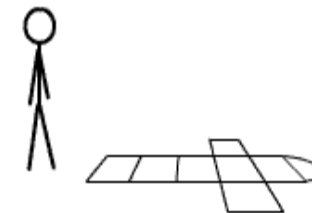
It's Good But.....

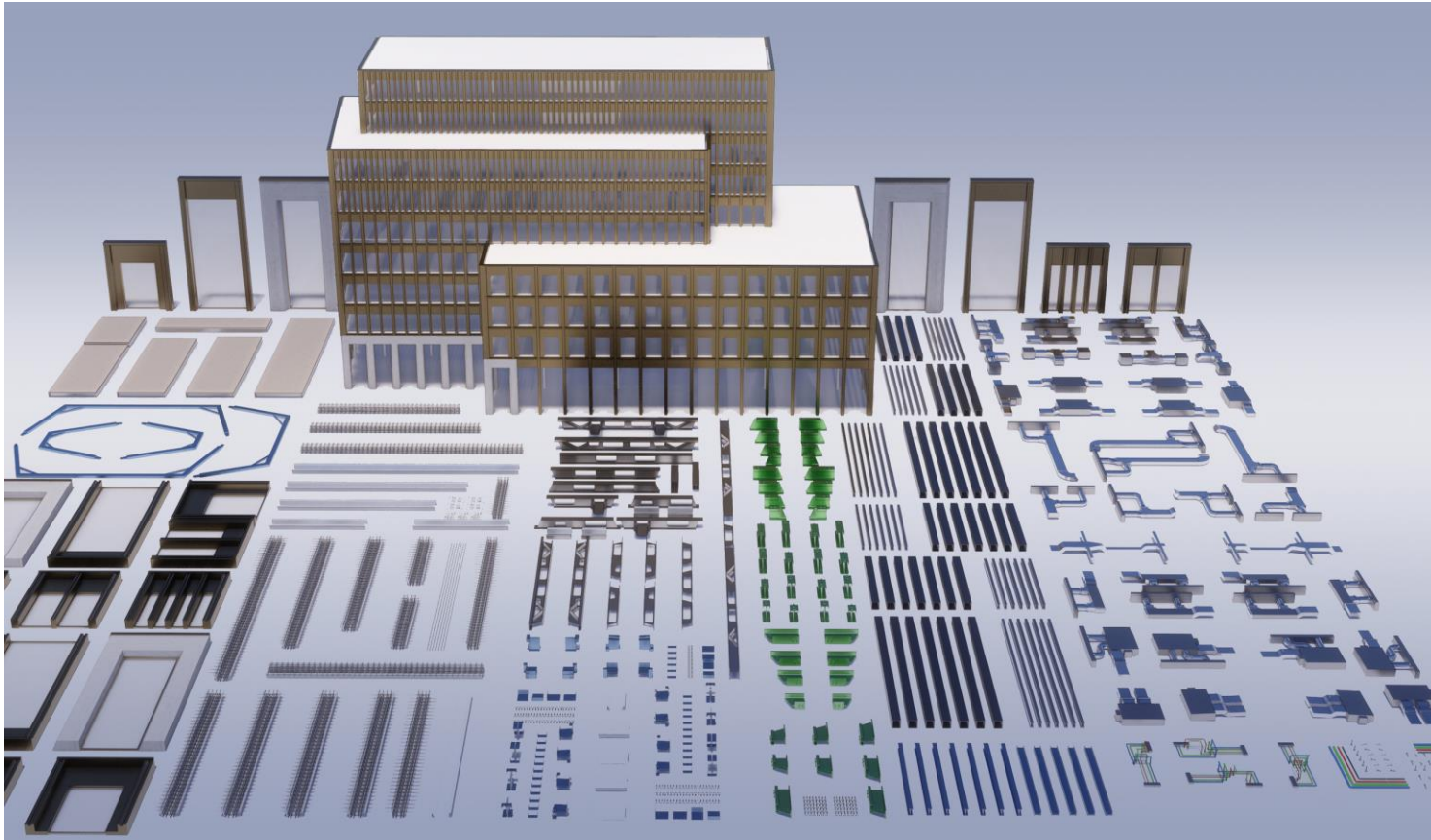
- It is the **POLITICAL** challenge of getting stakeholders across functions to agree on common business processes
- It's about IT to enable business teaming together to work through how **THINKS** should run



....Susan Kampe,
Vice president and general manager of IT,
Johnson Controls

***Innovate our mind before
innovate the product & process!***



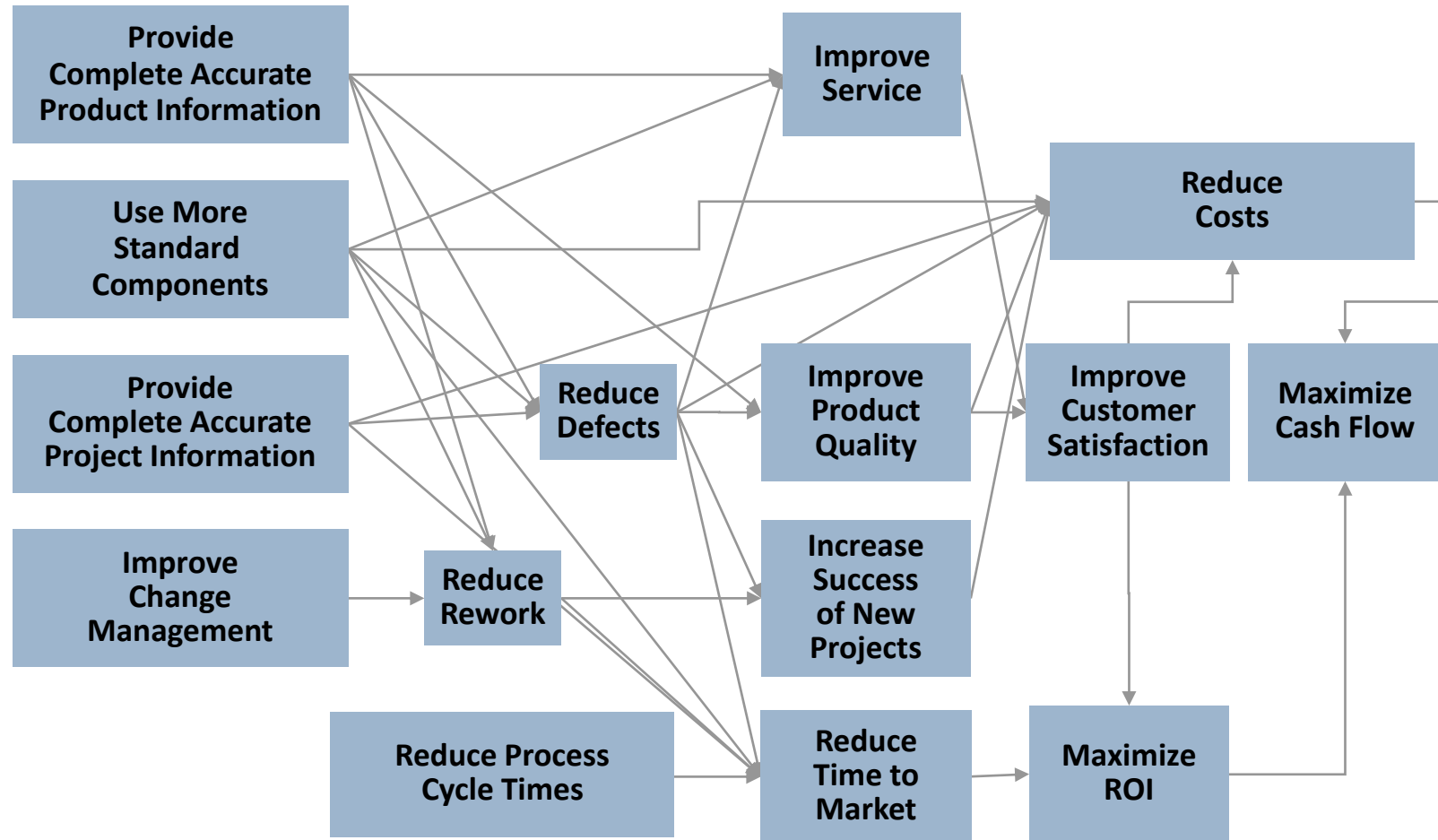


Agenda

- MTECH Introduction
- BIM for Building Construction
- Digital Construction for MIC
- Challenges
- **Conclusion**

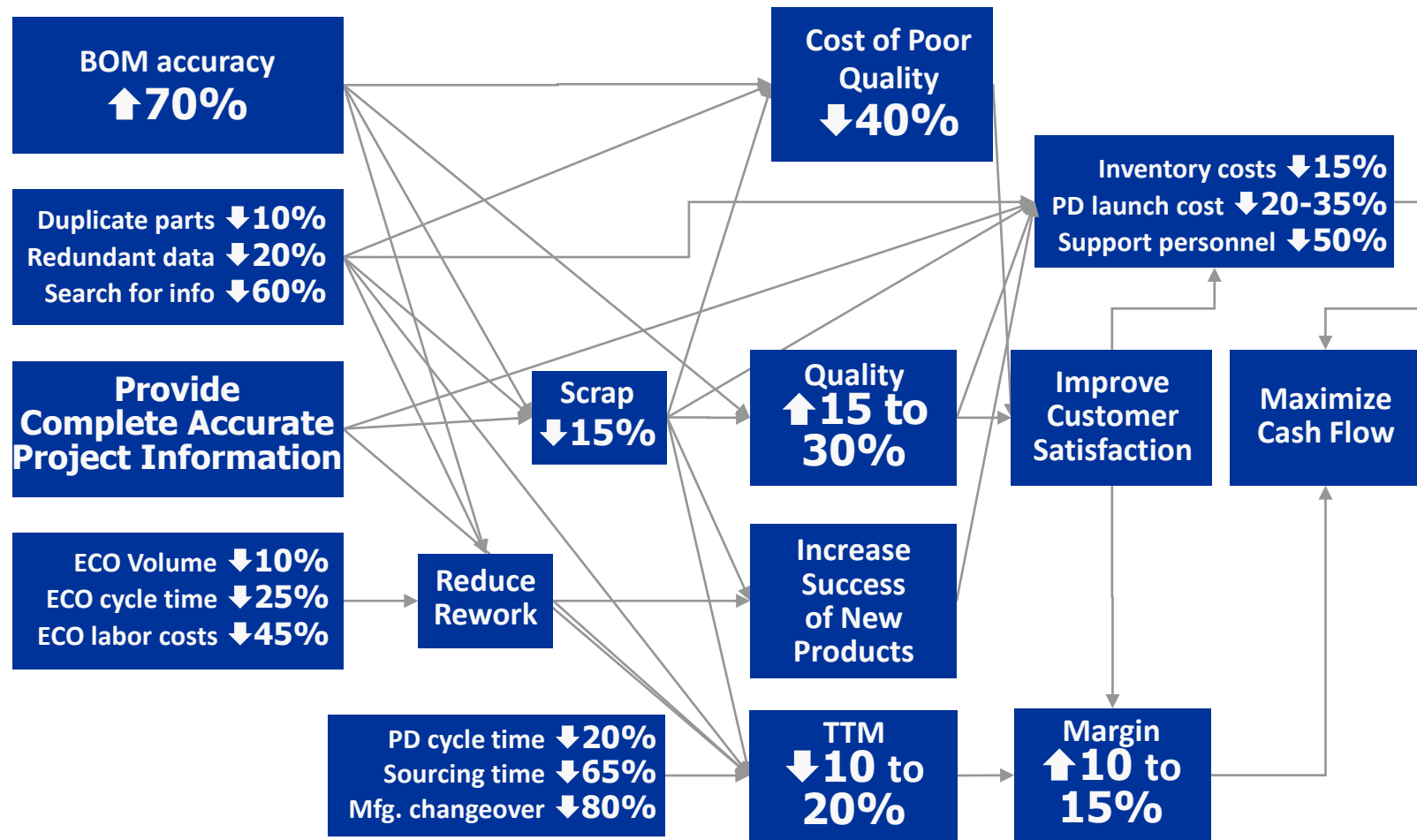


What are the Value of DFMA?





PLM Impacts Everything (Manufacturing)





Framework for Getting Simple

Complete on Clarity

- Change how time is used
- 3D for ALL
- Engaging everyone

Smart Design Work

- Simpler to know, use, do & succeed
- Acting and thinking in the “living reality”

Lead Through Navigation

- Structure the project operation according to the questions people ask – Working Dashboard





Open Discussion

How Far From Our Goal?

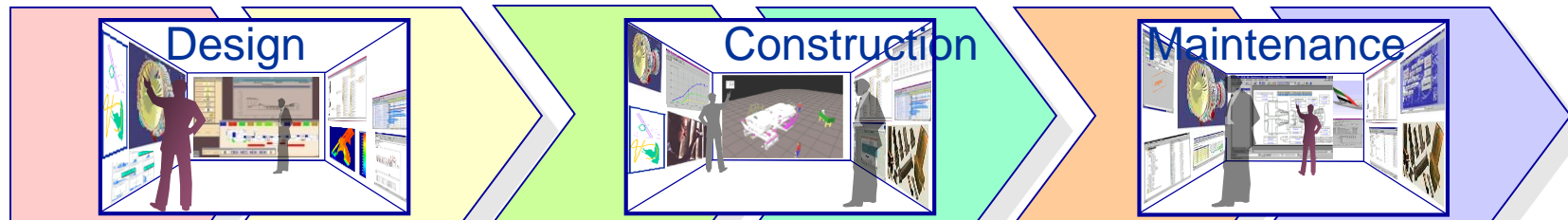
www.mtech.com.hk



VIRTUAL ROOMS

Management of the building and related decision making data throughout the life cycle in real time within an integrated Collaborative Environment
Real Time Enterprise

Project Management

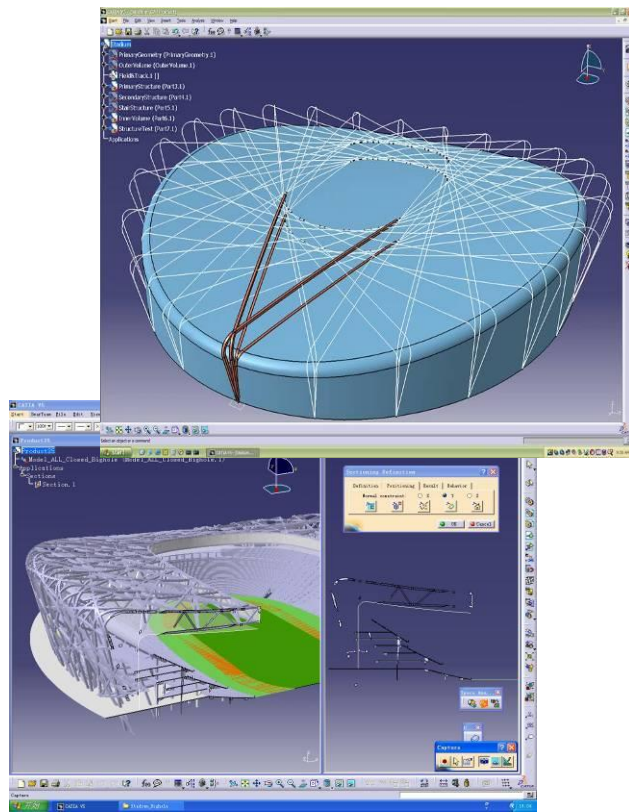




Structural Design - 2008 Beijing Olympic Stadium

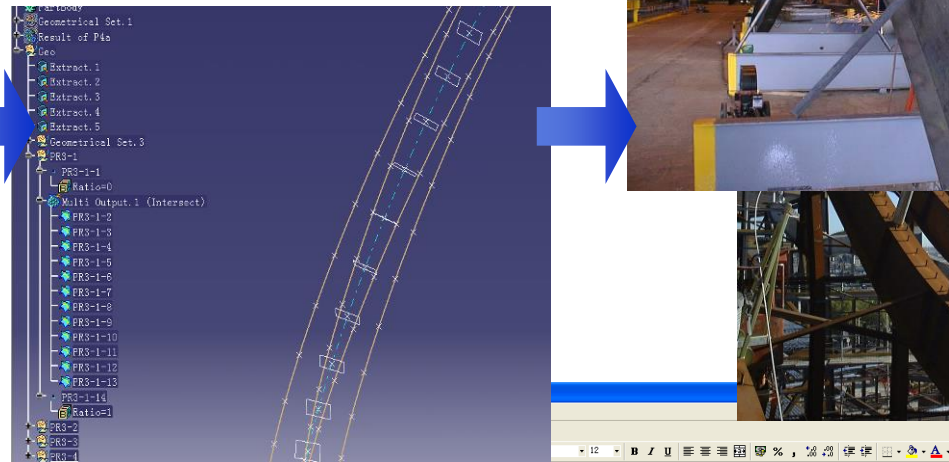
Structural design:

- Output co-ordinated report of structural elements to manufacturing



Main frame structural design

Reporting geometry for fabrication



Manufacturing and installation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	PR3-1	x	y	z	PR3-2	x	y	z	PR3-3	x	y	z	PR3-4	x	y	z	
2	PR3-1-1	-100251	-111058	56301.12	PR3-2-1	-99249.4	-111767	56165.83	PR3-3-1	-100386	-110882	54211.72	PR3-4-1	-99414.9	-111618	53986.	
3	PR3-1-2	-100759	-112222	55197.48	PR3-2-2	-99623.3	-112645	55063.42	PR3-3-2	-100783	-111975	54022.64	PR3-4-2	-99686.6	-112385	53893	
4	PR3-1-3	-101258	-113368	54849.19	PR3-2-3	-100119	-113801	54792.85	PR3-3-3	-101160	-113021	53703.91	PR3-4-3	-100061	-113439	53649.59	
5	PR3-1-4	-101735	-114464	54355.87	PR3-2-4	-100603	-114921	54372.63	PR3-3-4	-101516	-114023	53260.78	PR3-4-4	-100426	-114464	53276.93	
6	PR3-1-5	-102182	-115495	53725.53	PR3-2-5	-101069	-115990	53806.79	PR3-3-5	-101849	-114967	52700.44	PR3-4-5	-100775	-115443	52778.77	
7	PR3-1-6	-102594	-116447	52966.6	PR3-2-6	-101509	-116989	53100.01	PR3-3-6	-102152	-115840	52030.46	PR3-4-6	-101104	-116363	52159.21	
8	PR3-1-7	-102965	-117305	52088.43	PR3-2-7	-101916	-117903	52258.11	PR3-3-7	-102421	-116628	51259.19	PR3-4-7	-101407	-117207	51423.32	
9	PR3-1-8	-103287	-118051	51101.81	PR3-2-8	-102282	-118712	51288.82	PR3-3-8	-102652	-117317	50396.3	PR3-4-8	-101676	-117958	50577.74	
10	PR3-1-9	-103555	-118672	50019.75	PR3-2-9	-102597	-119396	50202.65	PR3-3-9	-102839	-117893	49453.41	PR3-4-9	-101905	-118598	49631.5	
11	PR3-1-10	-103763	-119150	48858.21	PR3-2-10	-102851	-119934	49014.09	PR3-3-10	-102979	-118341	48444.68	PR3-4-10	-102087	-119108	48597.09	
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13	PR3-1-12	-103974	-119618	46379.37	PR3-2-12	-103140	-120492	46415.29	PR3-3-12	-103099	-118800	46302.29	PR3-4-12	-102278	-119662	46337.72	
14	PR3-1-13	-103967	-119585	45113.73	PR3-2-13	-103158	-120478	45064.23	PR3-3-13	-103075	-118790	45213.34	PR3-4-13	-102273	-119673	45164.35	
15	PR3-1-14	-103888	-119375	43906.03	PR3-2-14	-103084	-120256	43731.61	PR3-3-14	-102996	-118622	44182.49	PR3-4-14	-102197	-119494	44002.89	