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BIM & The Contractor

Setting the Transformation Right for Productivity

Edmund Leong, Manager (BIM)

BuildSmart Conference 2014
@Singapore Construction Productivity Week

15-Oct-2014

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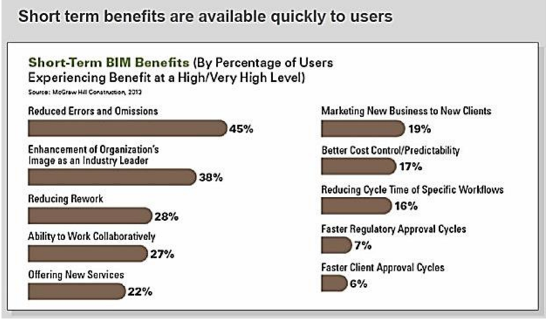
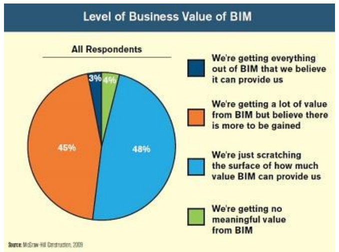
BIM Benefits

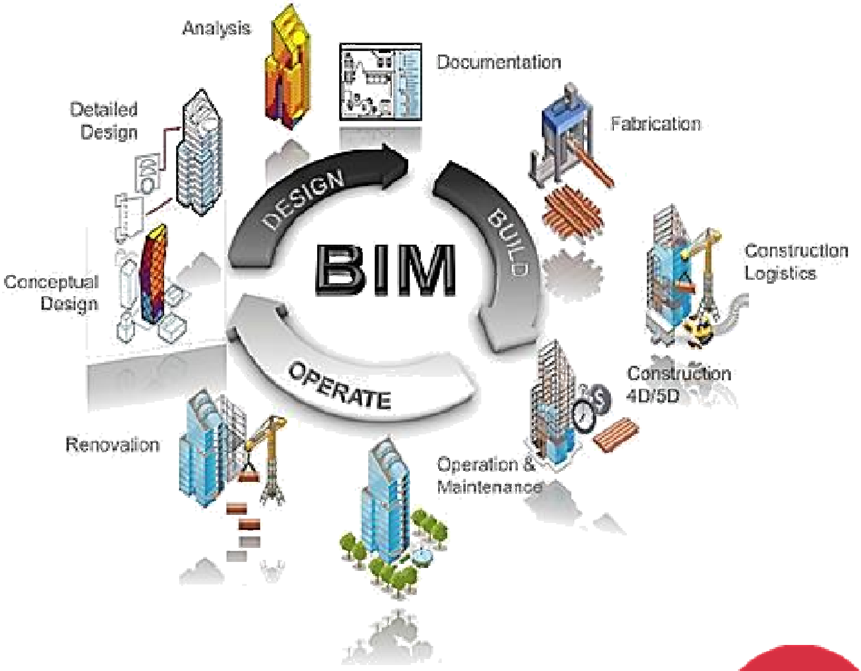

Short term benefits are available quickly to users

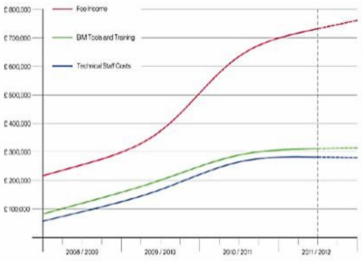
Short-Term BIM Benefits (By Percentage of Users Experiencing Benefit at a High/Very High Level)

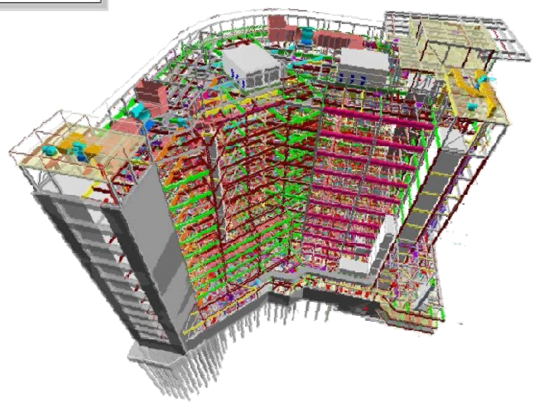
Source: McGraw Hill Construction, 2013

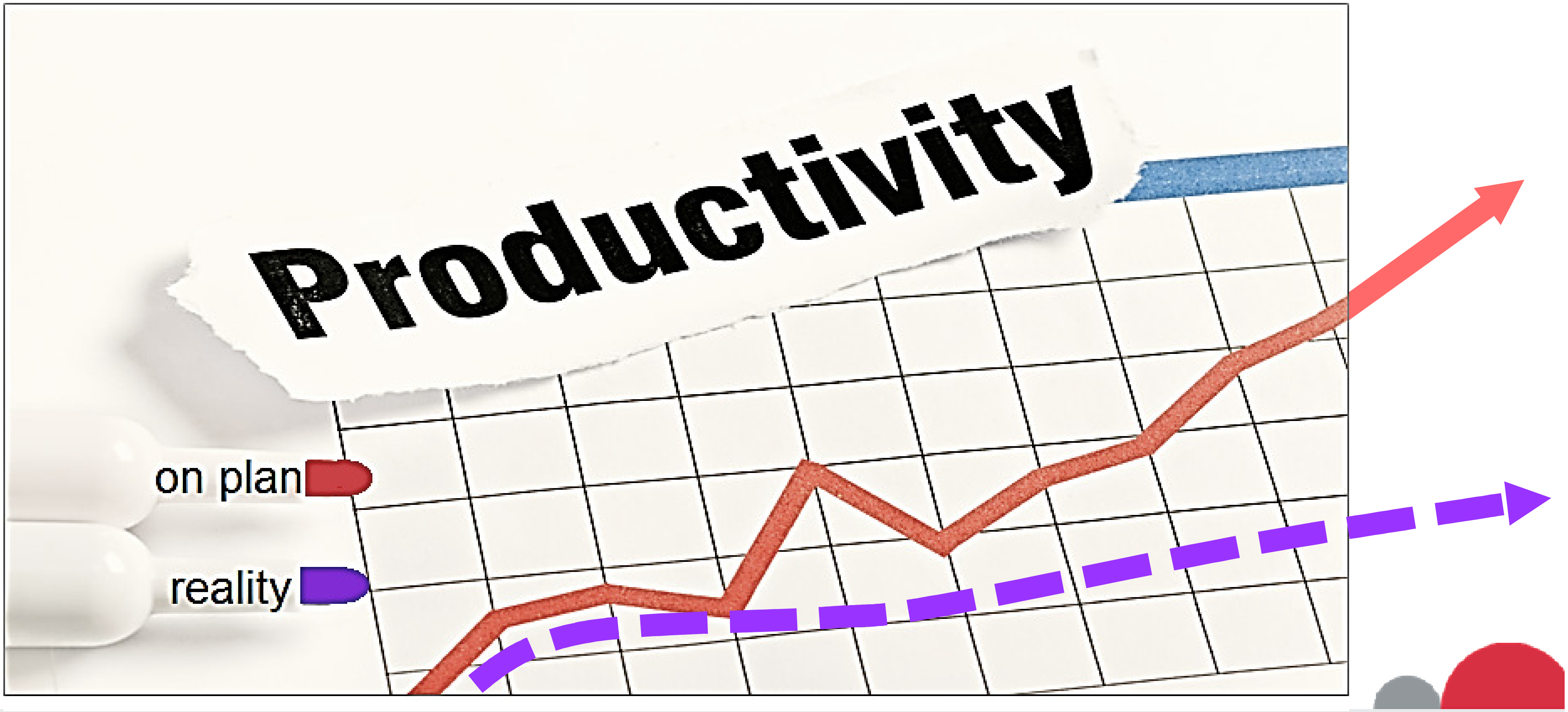

Level of Business Value of BIM

Source: McGraw-Hill Construction, 2009

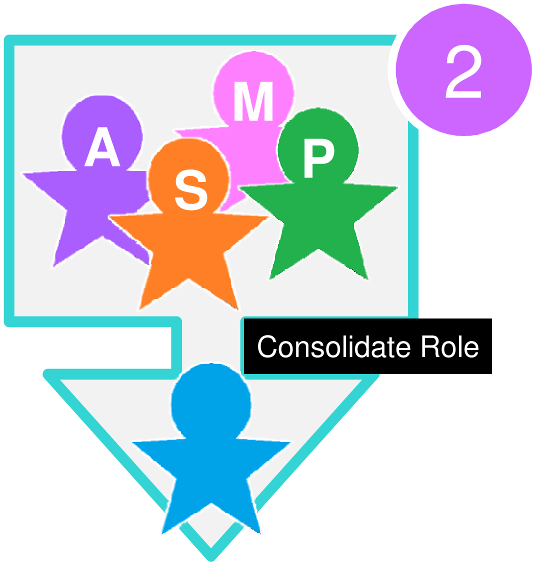

Analysis
Documentation
Fabrication
Construction Logistics
Construction 4D/5D
Operation & Maintenance
Renovation
Conceptual Design
Detailed Design
DESIGN
BUILD
OPERATE
BIM






Productivity
on plan
reality

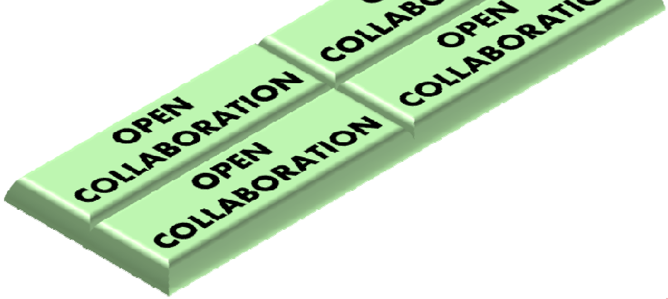
information
1



Consolidate Role

the BiG BIM THEORY
3

p://www.meetup.com/Big-BIM-Theory/about/comments/?o


4
OPEN COLLABORATION
OPEN COLLABORATION
OPEN COLLABORATION
OPEN COLLABORATION

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1

information

INFORMATION information information

information INFORMATION information

information Information

information information information

information information information

information information

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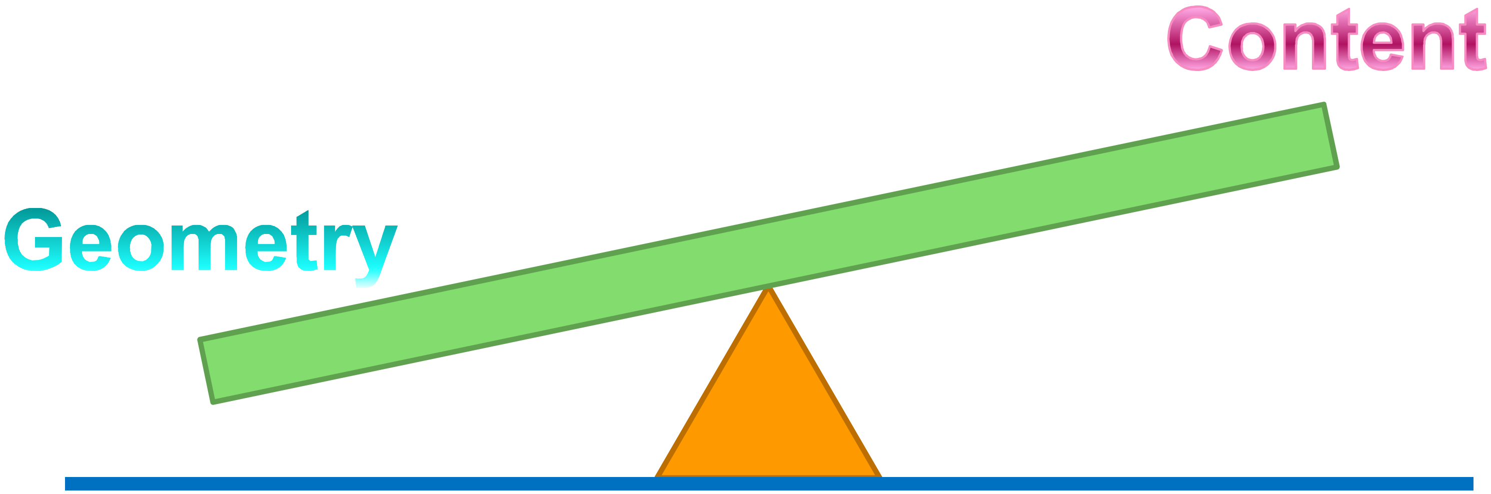
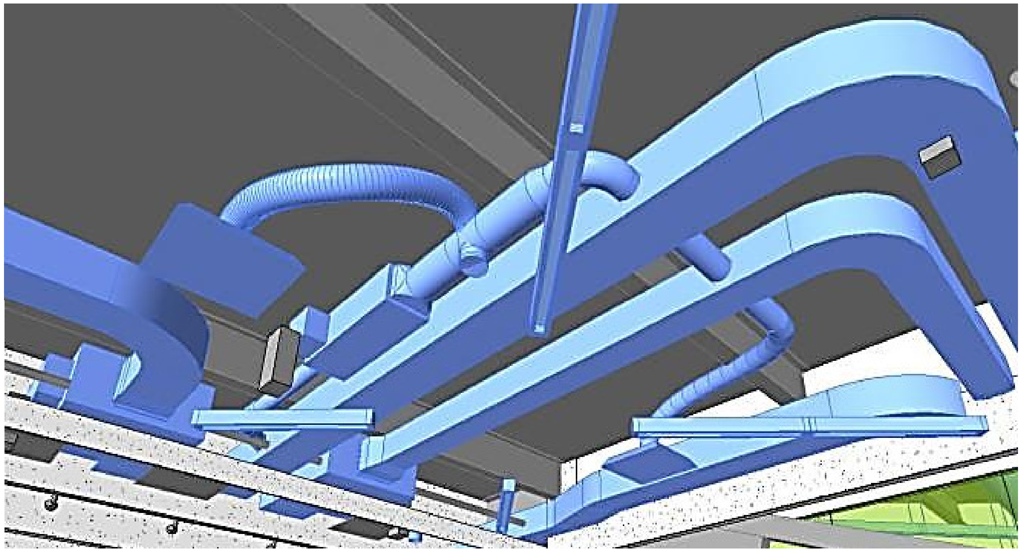
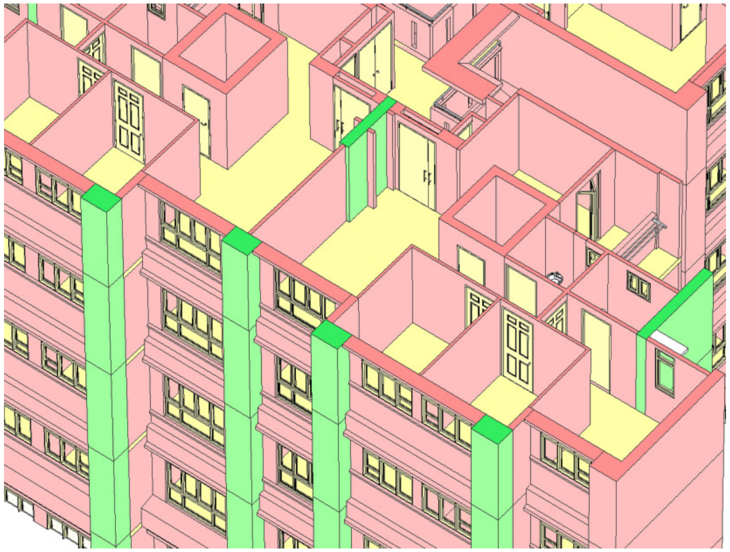
Making a Balance in Modeling

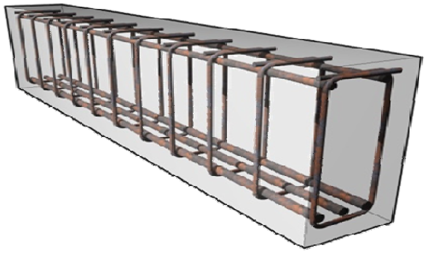

Content
Geometry

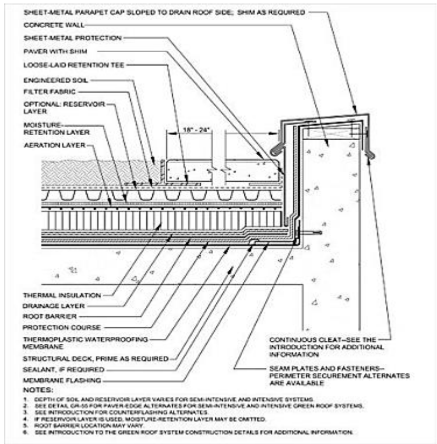
Geometry or Content ?



Geometry or Content ?






SHEET-METAL PARAPET CAP SLOPED TO DRAIN ROOF SIDE; SHIM AS REQUIRED
CONCRETE WALL
SHEET-METAL PROTECTION
PAVER WITH SHIM
LOOSE-LAID RETENTION TEE
ENGINEERED SOIL
FILTER FABRIC
OPTIONAL: RESERVOIR LAYER
MOISTURE-RETENTION LAYER
AERATION LAYER
18" - 24"
THERMAL INSULATION
DRAINAGE LAYER
ROOT BARRIER
PROTECTION COURSE
THERMOPLASTIC WATERPROOFING MEMBRANE
STRUCTURAL DECK, PRIME AS REQUIRED
SEALANT, IF REQUIRED
MEMBRANE FLASHING
CONTINUOUS CLEAT–SEE THE INTRODUCTION FOR ADDITIONAL INFORMATION
SEAM PLATES AND FASTENERS–PERIMETER SECUREMENT ALTERNATES ARE AVAILABLE

NOTES:

1. DEPTH OF SOIL AND RESERVOIR LAYER VARIES FOR SEMI-INTENSIVE AND INTENSIVE SYSTEMS.
2. SEE DETAIL GR-55 FOR PAVER-EDGE ALTERNATES FOR SEMI-INTENSIVE AND INTENSIVE GREEN ROOF SYSTEMS.
3. SEE INTRODUCTION FOR COUNTERFLASHING ALTERNATES.
4. IF RESERVOIR LAYER IS USED, MOISTURE-RETENTION LAYER MAY BE OMITTED.
5. ROOT BARRIER LOCATION MAY VARY.
6. SEE INTRODUCTION TO THE GREEN ROOF SYSTEM CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

3C35

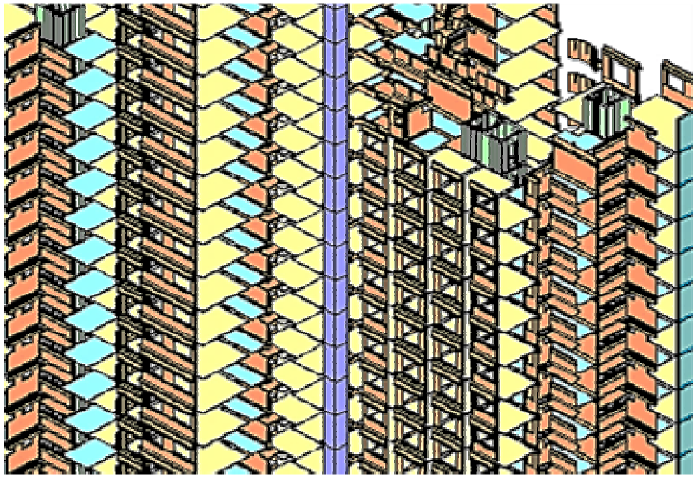
1BH102

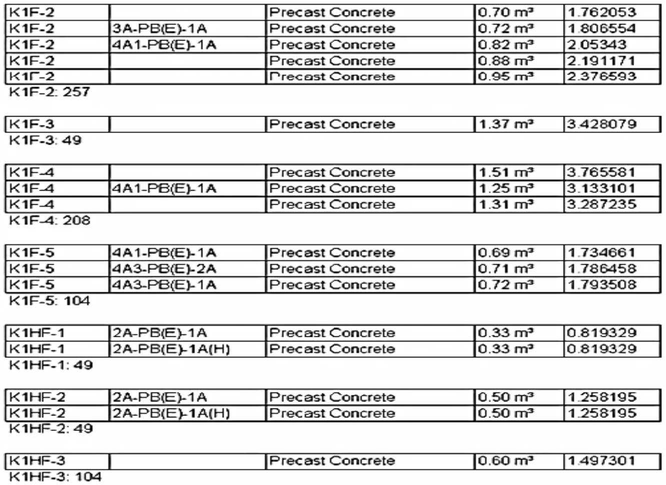
K1F-3

4A1-PB(E)-1A

Geometry or Content ?

- Information → Derived or Inferred
- Sufficient information → Better Productivity





K1F-2		Precast Concrete	0.70 m^3	1.762053
K1F-2	3A-PB(E)-1A	Precast Concrete	0.72 m^3	1.806554
K1F-2	4A1-PB(E)-1A	Precast Concrete	0.82 m^3	2.05343
K1F-2		Precast Concrete	0.88 m^3	2.191171
K1F-2		Precast Concrete	0.95 m^3	2.376593
K1F-2: 257				
K1F-3		Precast Concrete	1.37 m^3	3.428079
K1F-3: 49				
K1F-4		Precast Concrete	1.51 m^3	3.765581
K1F-4	4A1-PB(E)-1A	Precast Concrete	1.25 m^3	3.133101
K1F-4		Precast Concrete	1.31 m^3	3.287235
K1F-4: 208				
K1F-5	4A1-PB(E)-1A	Precast Concrete	0.69 m^3	1.734661
K1F-5	4A3-PB(E)-2A	Precast Concrete	0.71 m^3	1.786458
K1F-5	4A3-PB(E)-1A	Precast Concrete	0.72 m^3	1.793508
K1F-5: 104				
K1HF-1	2A-PB(E)-1A	Precast Concrete	0.33 m^3	0.819329
K1HF-1	2A-PB(E)-1A(H)	Precast Concrete	0.33 m^3	0.819329
K1HF-1: 49				
K1HF-2	2A-PB(E)-1A	Precast Concrete	0.50 m^3	1.258195
K1HF-2	2A-PB(E)-1A(H)	Precast Concrete	0.50 m^3	1.258195
K1HF-2: 49				
K1HF-3		Precast Concrete	0.60 m^3	1.497301
K1HF-3: 104				

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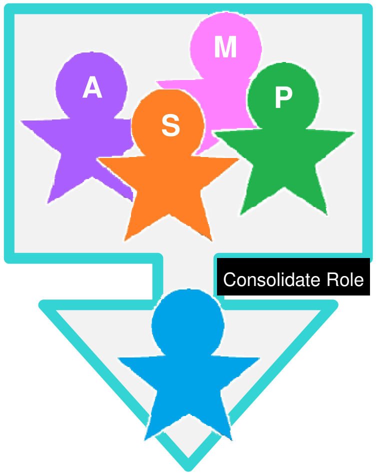
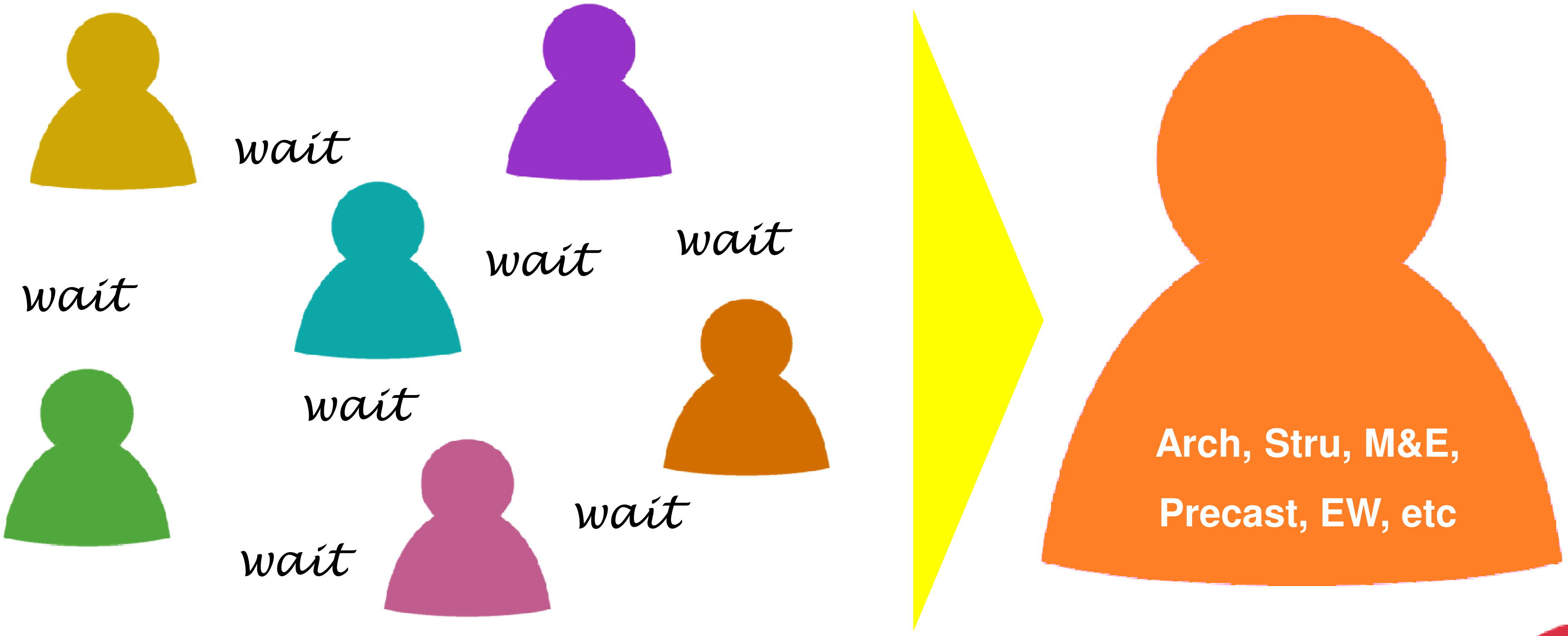

A
M
S
P
Consolidate Role

2



wait

wait

wait

wait

wait

wait

wait

Arch, Stru, M&E,

Precast, EW, etc

Single Role for "Arch/Stru/M&E/Precast” Modelling

- Accountability for Modeling Works
- “Big-Room” Meetings → Single Resource Support
- Challenges : Training Roadmap

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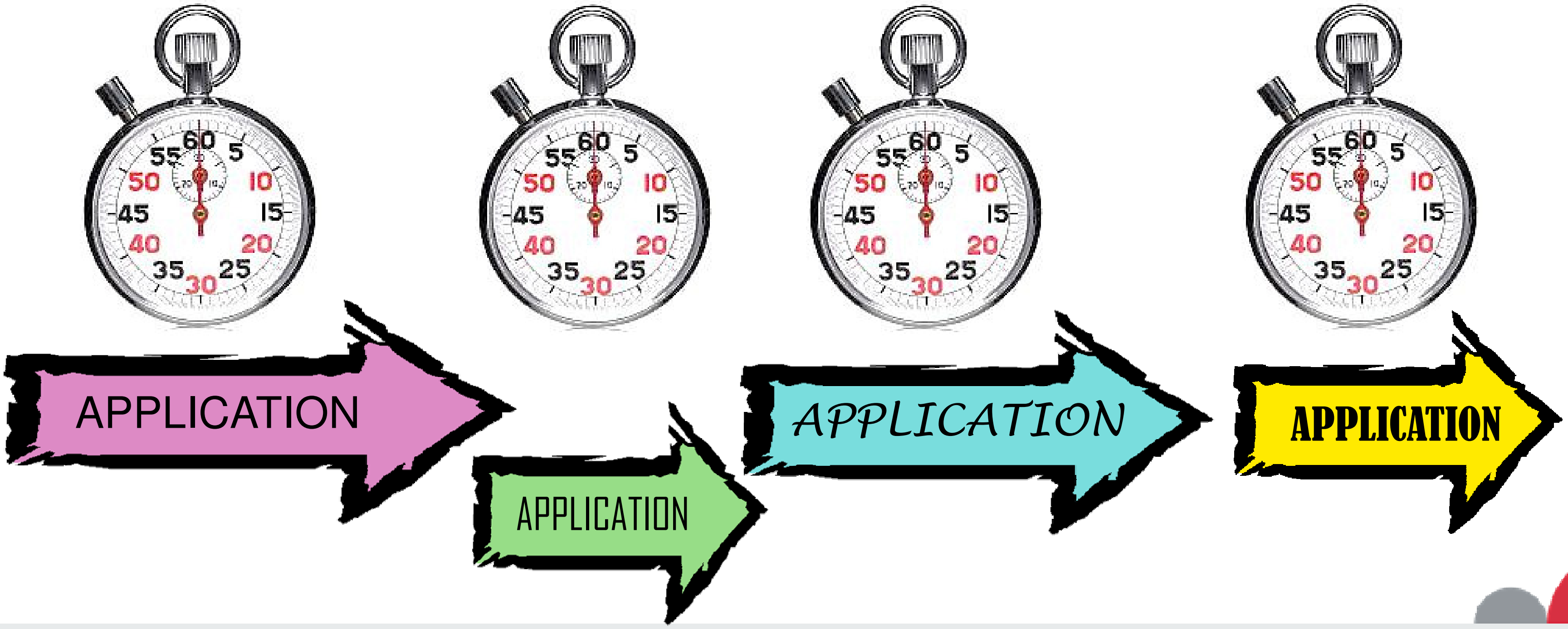
the BIG BIM THEORY

http://www.meetup.com/Big-BIM-

Parallel deployment affect Progress and Performance

Consider : Concept in “Big-BIM-Little-BIM”


APPLICATION
APPLICATION
APPLICATION
APPLICATION

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BIM Journey

Your Destination

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OPEN
COLLABORATION

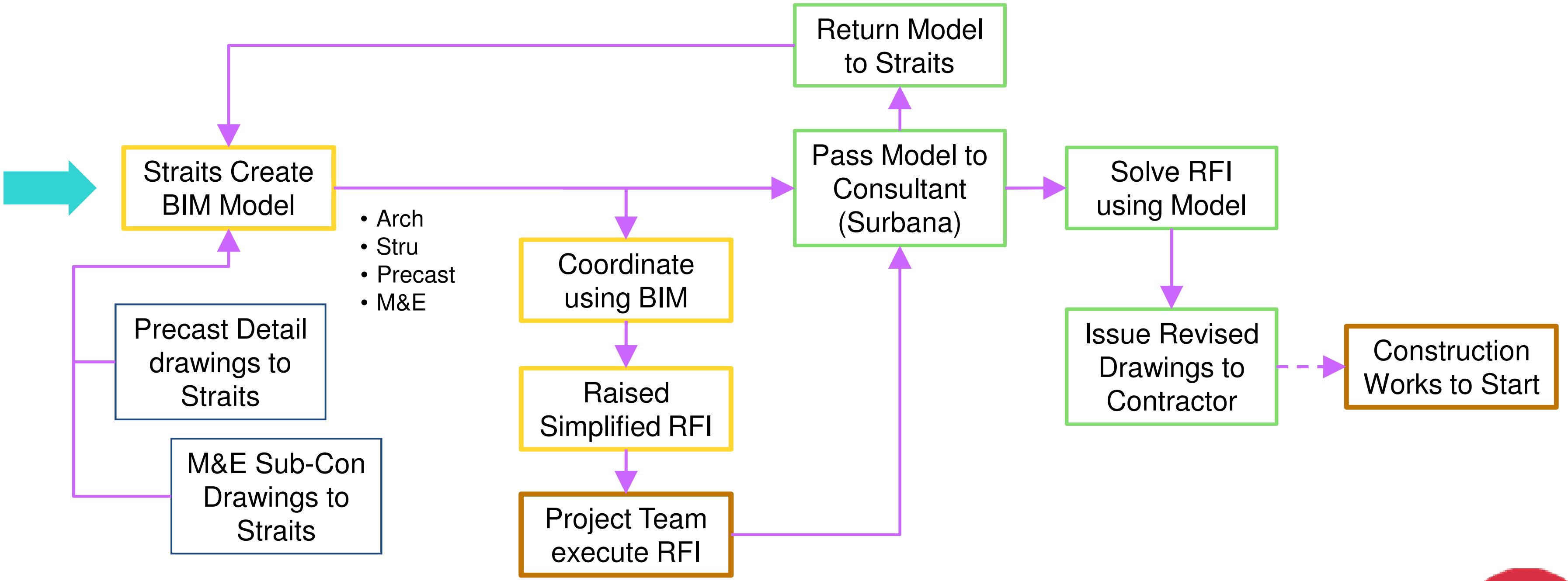
www.straitsconstruction.com

Open Collaboration & Sharing with Consultant

- HDB Bukit Merah RC-53
- The Situation
  - Consultant did not have the Model
  - Contractor wants turnaround on RFI in 1-Revision

- Create specialized Objects into Project Model
  - Information for Communication and Discussion

Redefining the process



Return Model to Straits

Straits Create BIM Model

- Arch
- Stru
- Precast
- M&E

Pass Model to Consultant (Surbana)

Solve RFI using Model

Coordinate using BIM

Precast Detail drawings to Straits

Raised Simplified RFI

Issue Revised Drawings to Contractor

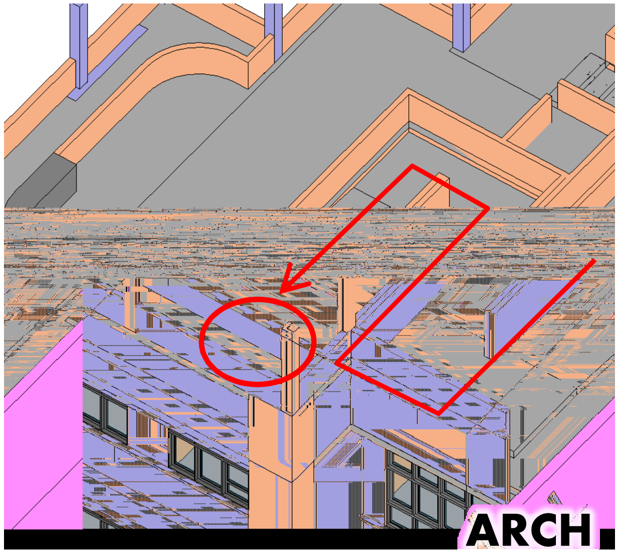
Construction Works to Start

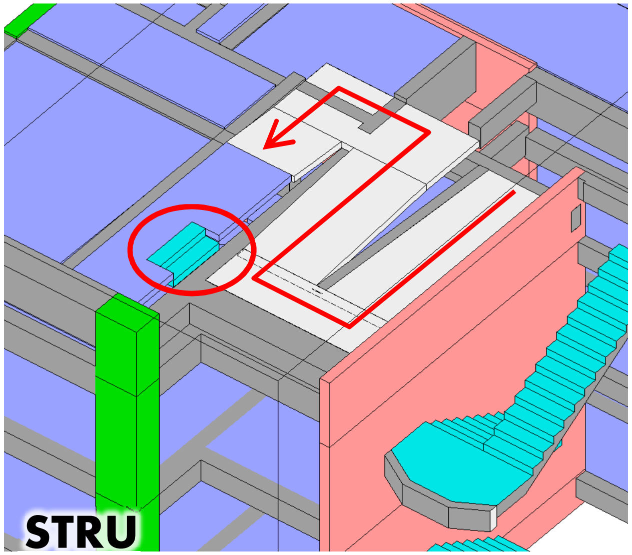
M&E Sub-Con Drawings to Straits

Project Team execute RFI

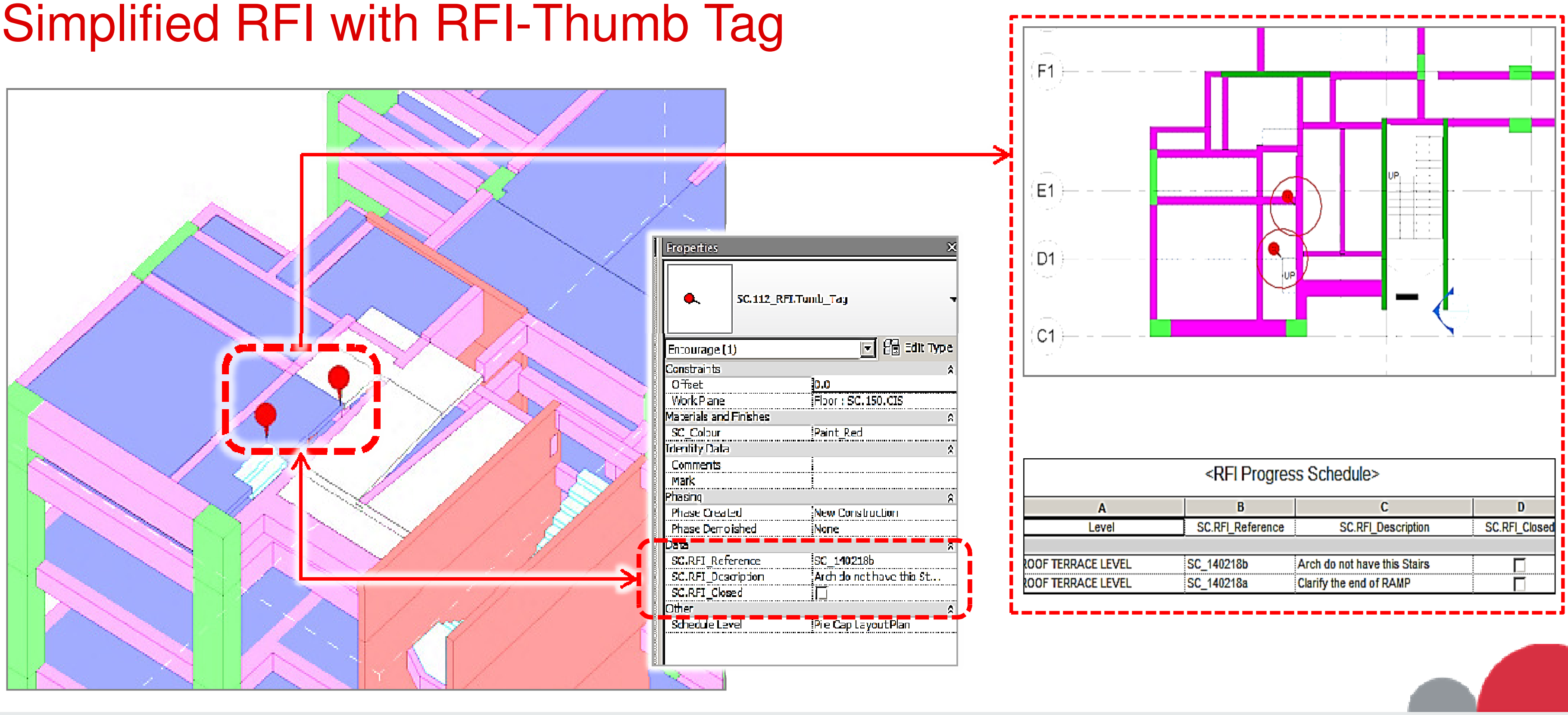
Confirmation

- RFI and Design Intent





Simplified RFI with RFI-Thumb Tag



SC.112_RFI.Tumb_Tag

Entourage (1)

Constraints	
Offset	0.0
Work Plane	Floor : SC.150.CIS
Materials and Finishes	
SC_Colour	Paint_Red
Identity Data	
Comments	
Mark	
Phasing	
Phase Created	New Construction
Phase Demolished	None
Data	
SC.RFI_Reference	SC_140218b
SC.RFI_Description	Arch do not have this St...
SC.RFI_Closed	☐
Other	
Schedule Level	Pile Cap Layout Plan

<RFI Progress Schedule>

A	B	C	D
Level	SC.RFI_Reference	SC.RFI_Description	SC.RFI_Closed
ROOF TERRACE LEVEL	SC_140218b	Arch do not have this Stairs	☐
ROOF TERRACE LEVEL	SC_140218a	Clarify the end of RAMP	☐

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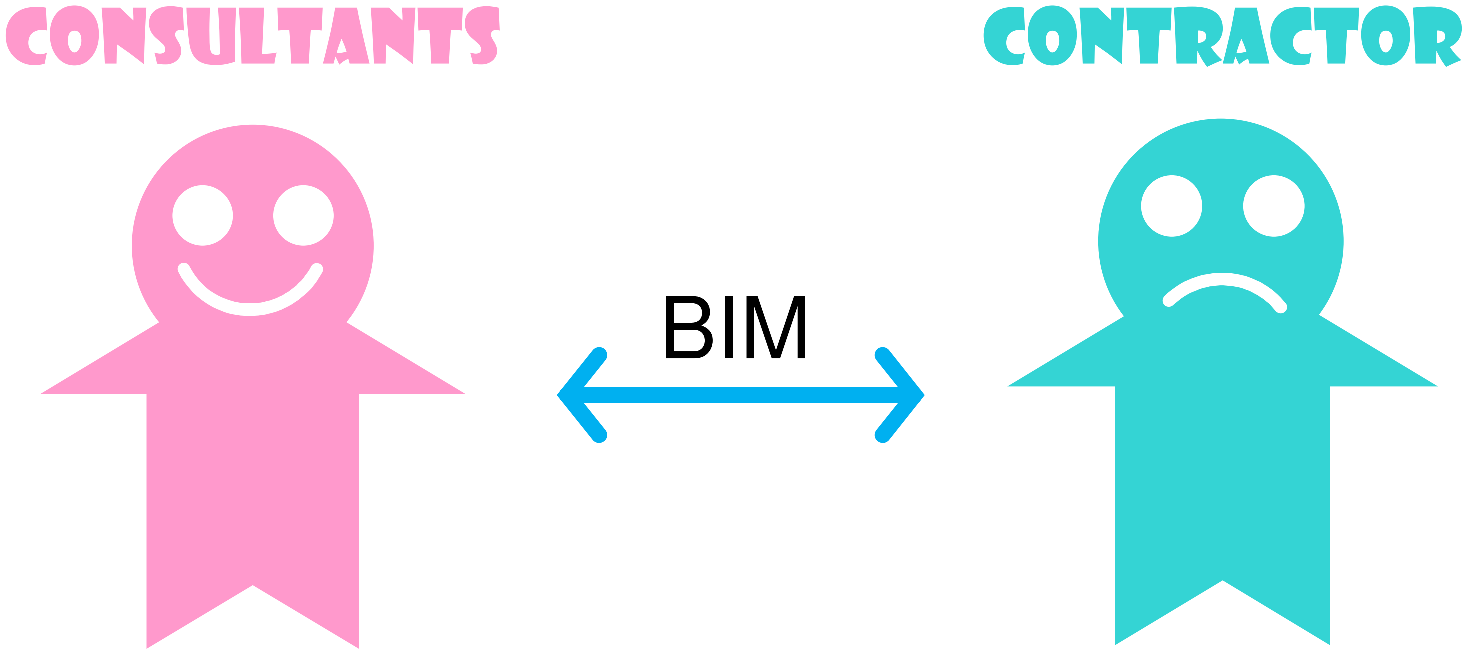
Closing

Conventional Practise


CONSULTANTS
BIM
CONTRACTOR

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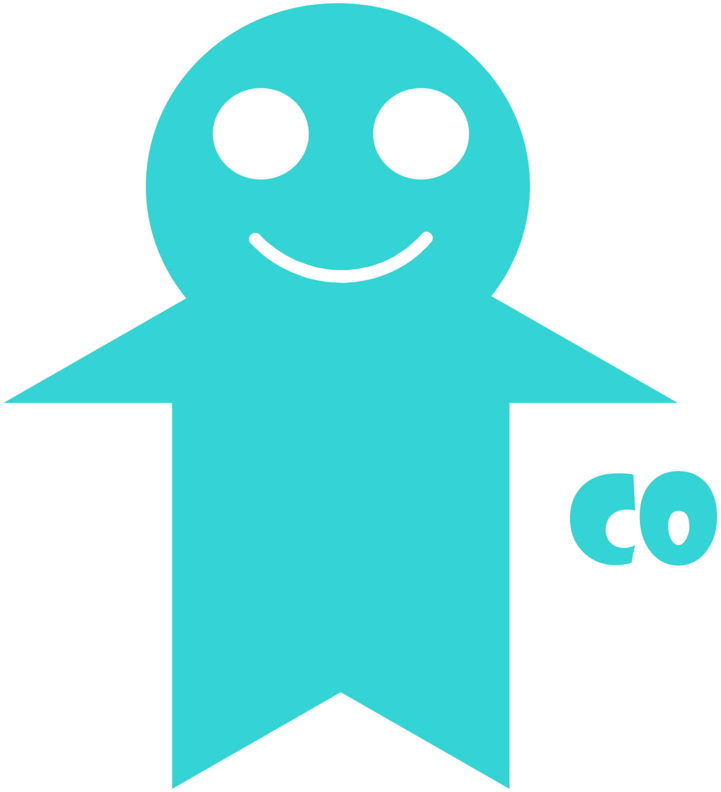

CONTRACTOR

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Formula of change

Variation of the Gleicher's Formula

Need for change	×	Clear vision & goals	×	Capability to change	×	Concrete first step	=	Successful change
	×	Clear vision & goals	×	Capability to change	×	Concrete first step	=	Slow start
Need for change	×		×	Capability to change	×	Concrete first step	=	Lack of coordination
Need for change	×	Clear vision & goals	×		×	Concrete first step	=	Frustration
Need for change	×	Clear vision & goals	×	Capability to change	×		=	Lack of action

Variation of the Gleicher's Formula, Source: Dannemiller, K. D., and Jacobs, R. W. (1992). Changing the way organizations change: A revolution of common sense. The Journal Of Applied Behavioral Science, 28(4), 480-498.

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End of Presentation