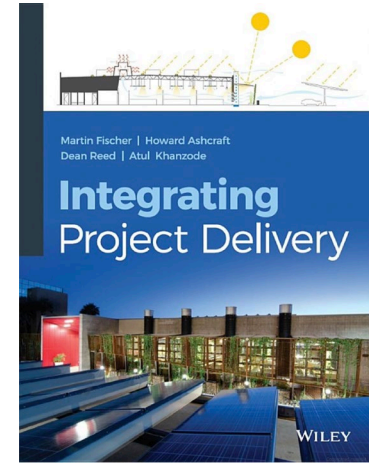


# Stop Managing Projects. Start Building Flywheels: The VDC Playbook for Relentless Performance

**Martin Fischer, [fischer@stanford.edu](mailto:fischer@stanford.edu)**

- Stanford University
  - Kumagai Professor in the School of Engineering
  - Professor, Civil & Environmental Engineering
  - Coordinator, Sustainable Design and Construction Program
  - Director, Center for Integrated Facility Engineering (CIFE)
  - Senior Fellow, Precourt Institute for Energy (PIE)
- Member, Swedish Academy of Engineering Sciences (ICA)



# Everyone wants to deliver great projects with a great team

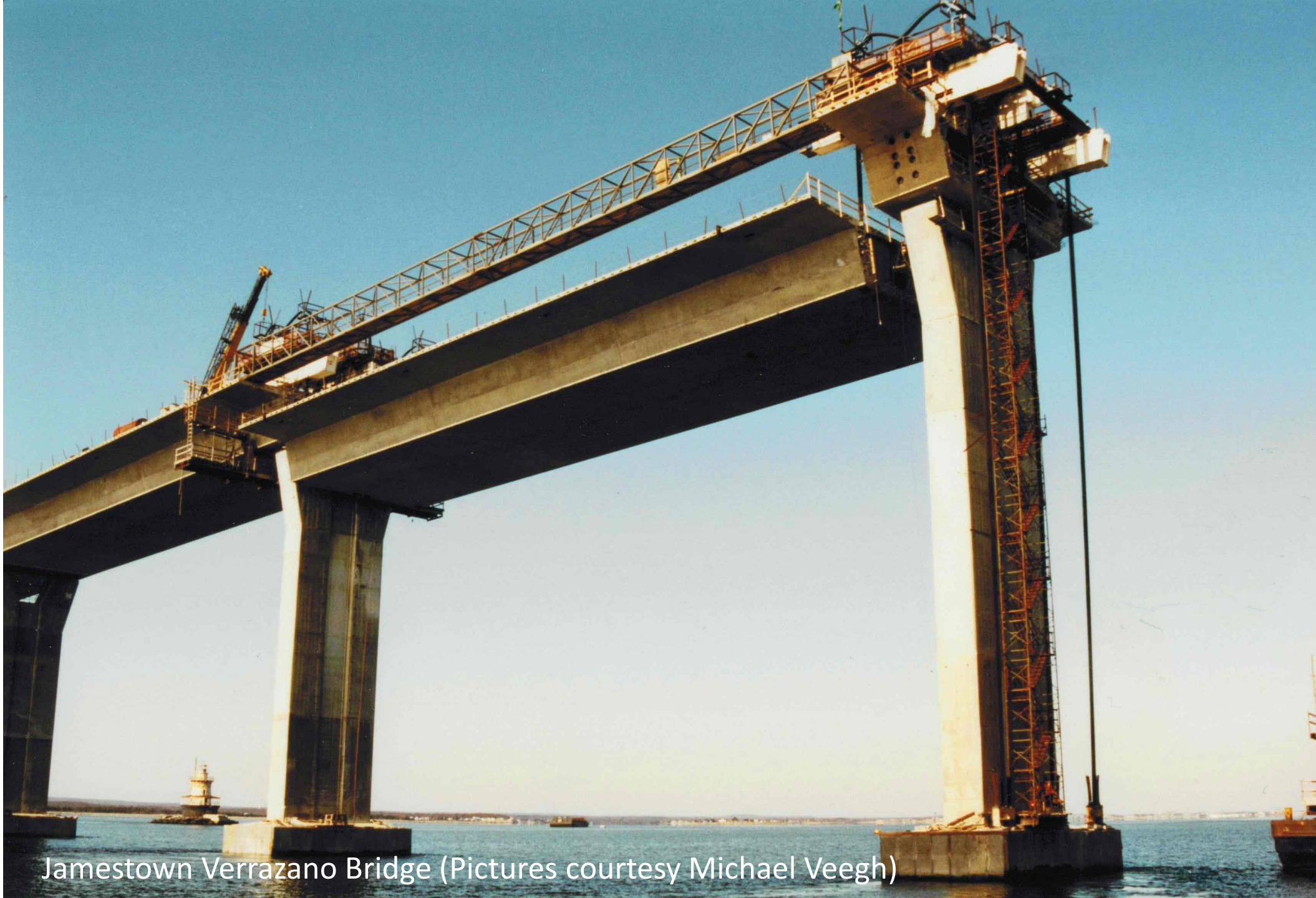
delivers high-  
performing  
buildings reliably

attracts good  
employees

”You are an idiot if you are not using the best tool possible.”

Manfred Fischer, 1972





Jamestown Verrazano Bridge (Pictures courtesy Michael Veegh)

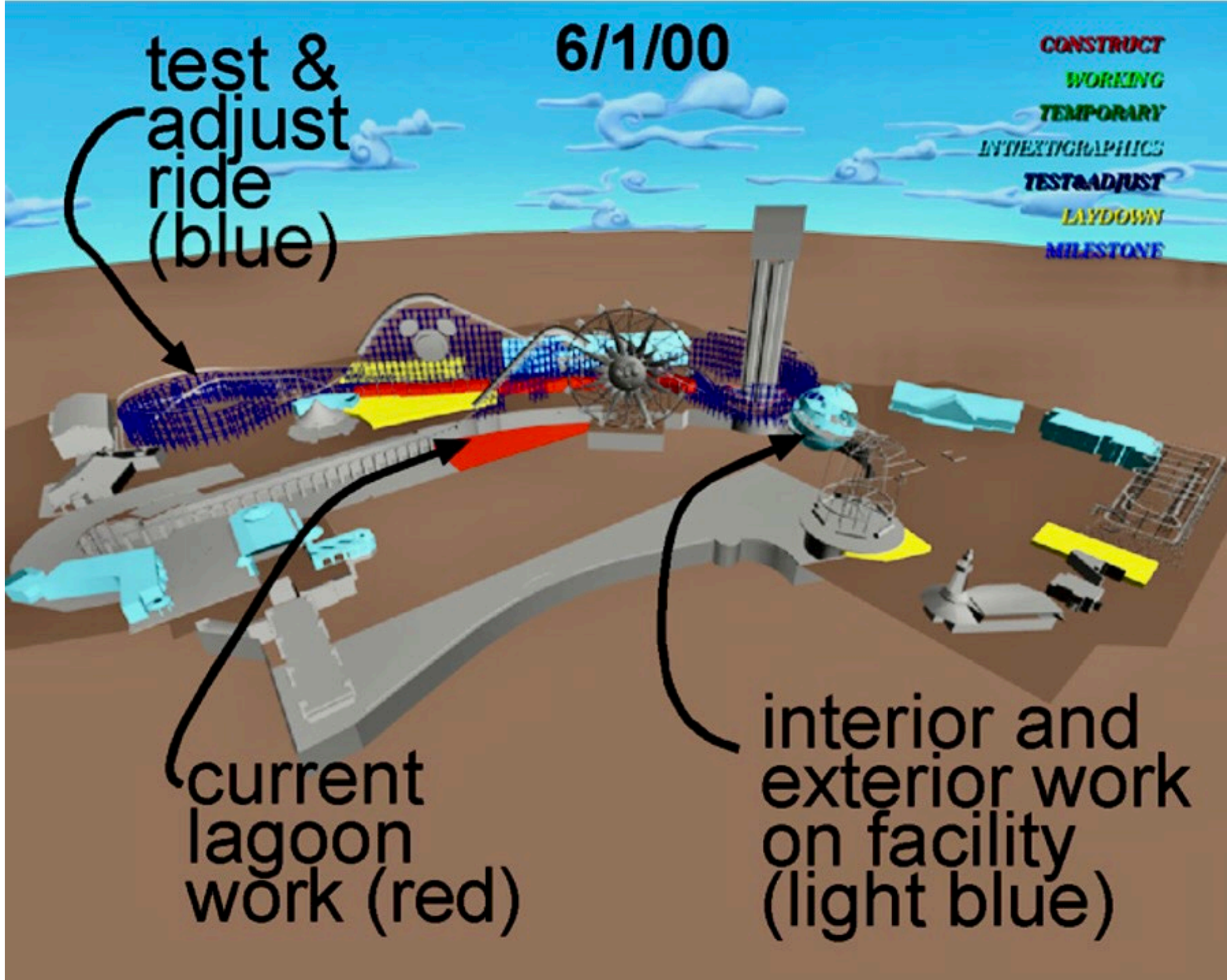
6/1/00

- CONSTRUCT
- WORKING
- TEMPORARY
- INTERGRAPHICS
- TEST&ADJUST
- LAYDOWN
- MILESTONE

test & adjust ride (blue)

current lagoon work (red)

interior and exterior work on facility (light blue)



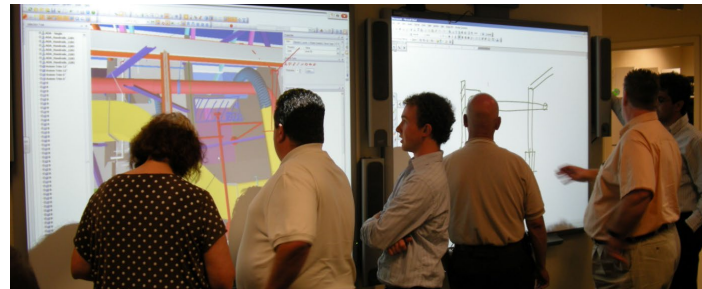
# VDC Framework



Client Objectives

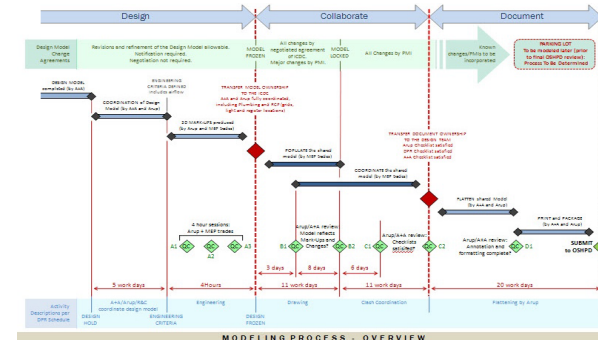
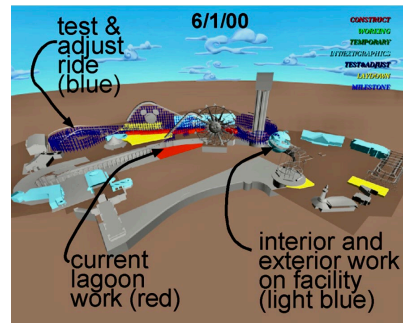


Project Objectives



Integrated Concurrent Engineering (ICE)

Building Information Modeling (BIM)



Project Production Management (PPM)

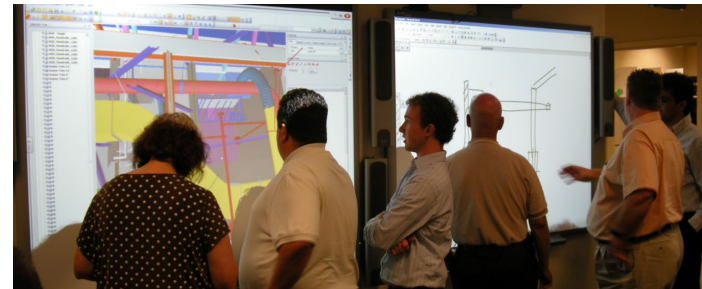
Full scope for a hospital delivered on budget and 30% faster



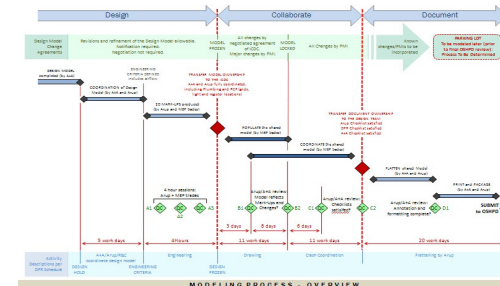
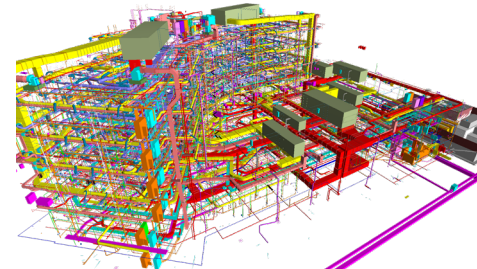
Clinical functions have the desired space +/- .5%  
Staff turnover reduced by 20%



On budget  
30% faster



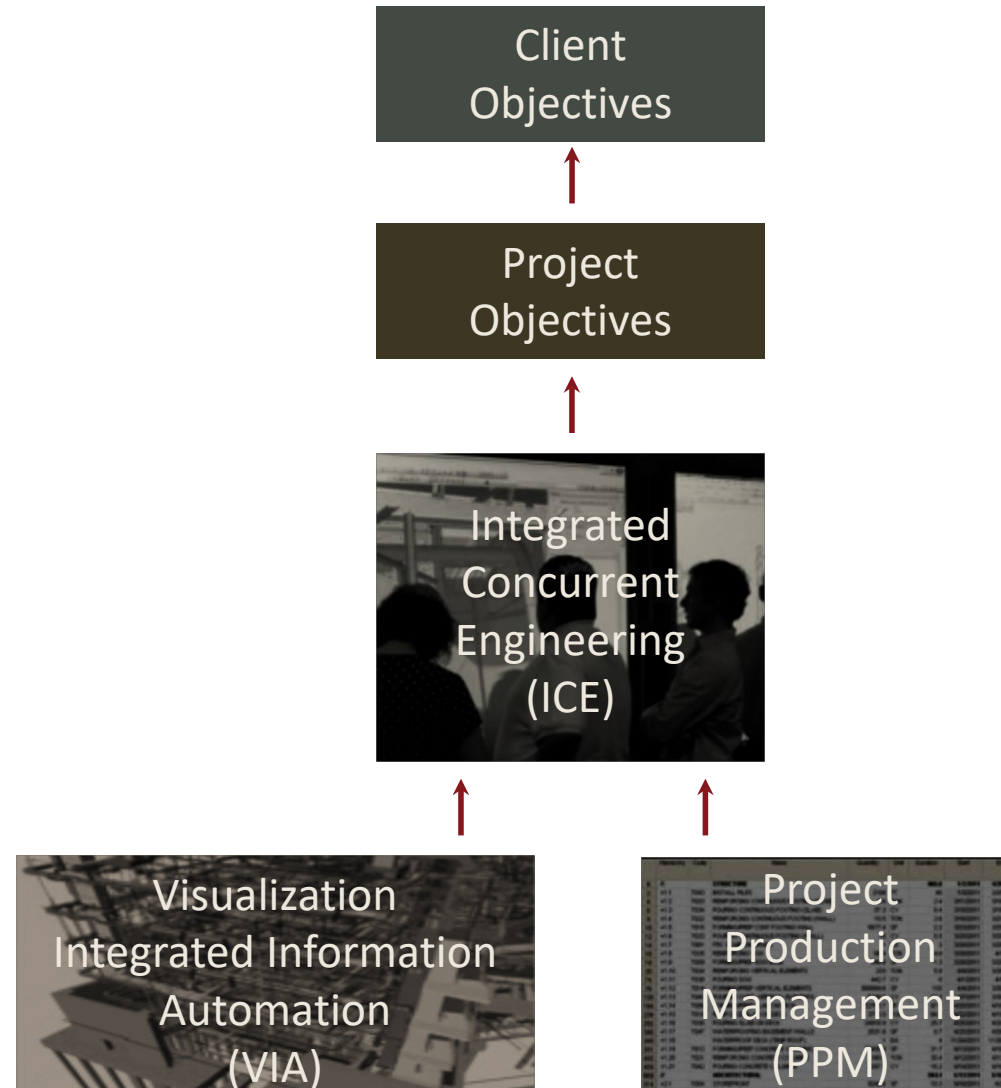
Big Room collocated 11+ critical firms  
95% of questions answered in < 1day



Weekly subcontractor coordination with 4D models  
Productivity > 110% of planned productivity

Objects > 1cm modeled in BIM  
Rework < 1%

# Voilà the VDC Framework



Designing and Constructing  
a 97,000 m<sup>2</sup>  
Multi-Sports Facility  
for the Pan American Games  
in LIMA 2019  
in 16 Months

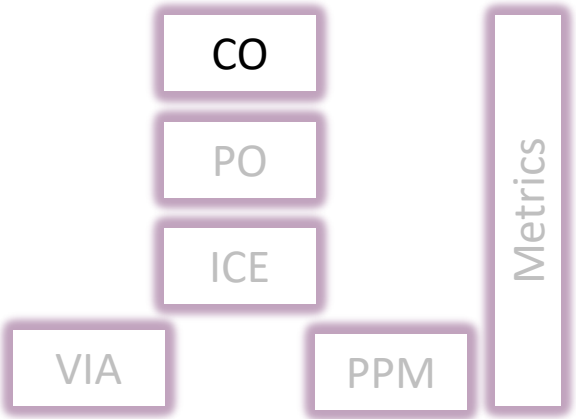


Stanford Development

**Stanford** | **ENGINEERING**  
Center for Global & Online Education

Slides by Raúl Eyzaguirre former head of VDC at COSAPI

# Client Objectives

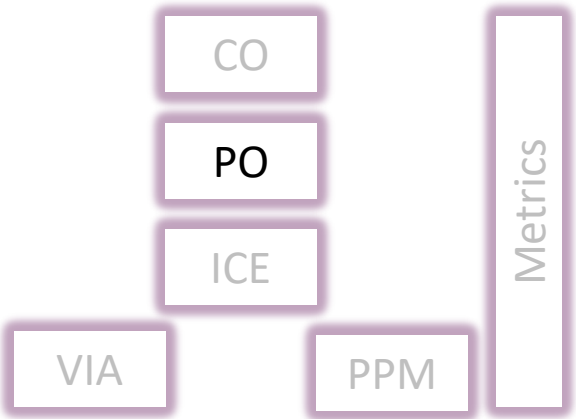


Lima hosted the Pan American Games and needed Olympic-level sports facilities  
National and international relevance  
+1,800 athletes in 39 sports  
33 countries



Legacy for Peruvian Sports Federations

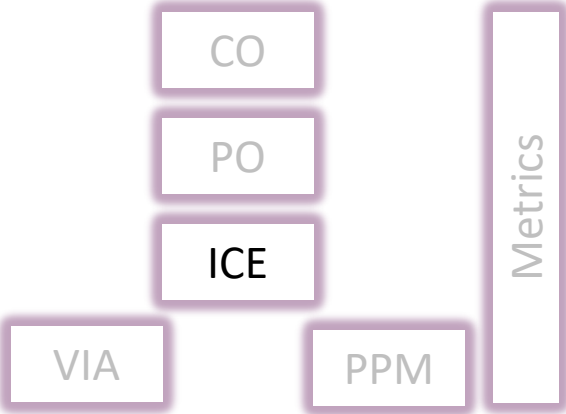
# Project Objectives



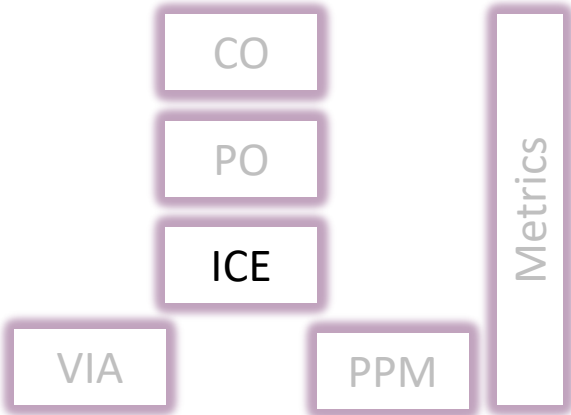
Main venue for the Games  
Fast Track, Design-Procurement-Construction  
97,000 m<sup>2</sup> constructed area  
150M+ USD



# ICE



# ICE



# BIM

CO

PO

ICE

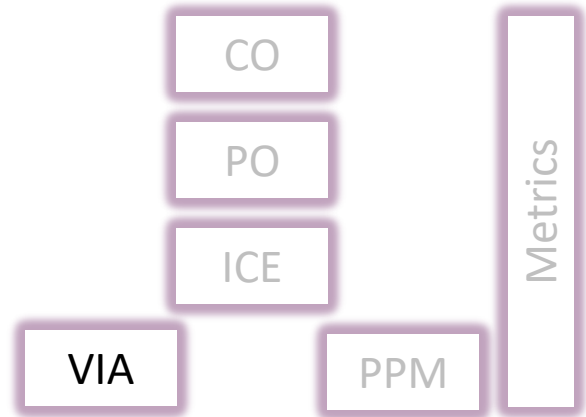
Metrics

VIA

PPM



# BIM



BIM developed for schematic design (LoD 200), design development (LoD 300), and “Issued for Construction” (LoD 350), taken to LoD 400 in the construction phase.

+ 60 models

+ 10 BIM uses implemented

+ + 3,000 Issues solved during design, no construction impact

90% of project staff used BIM

# PPM

CO

PO

ICE

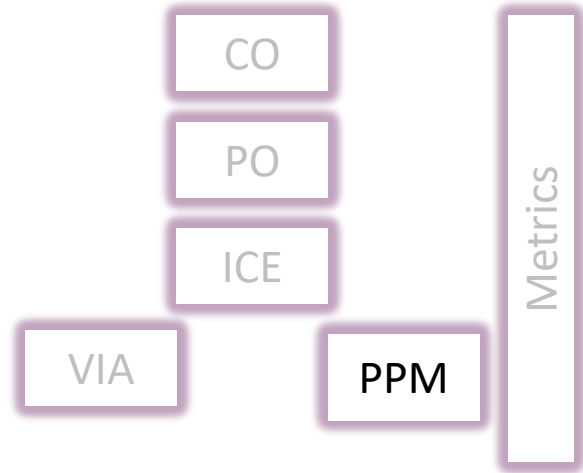
VIA

PPM

Metrics



# PPM



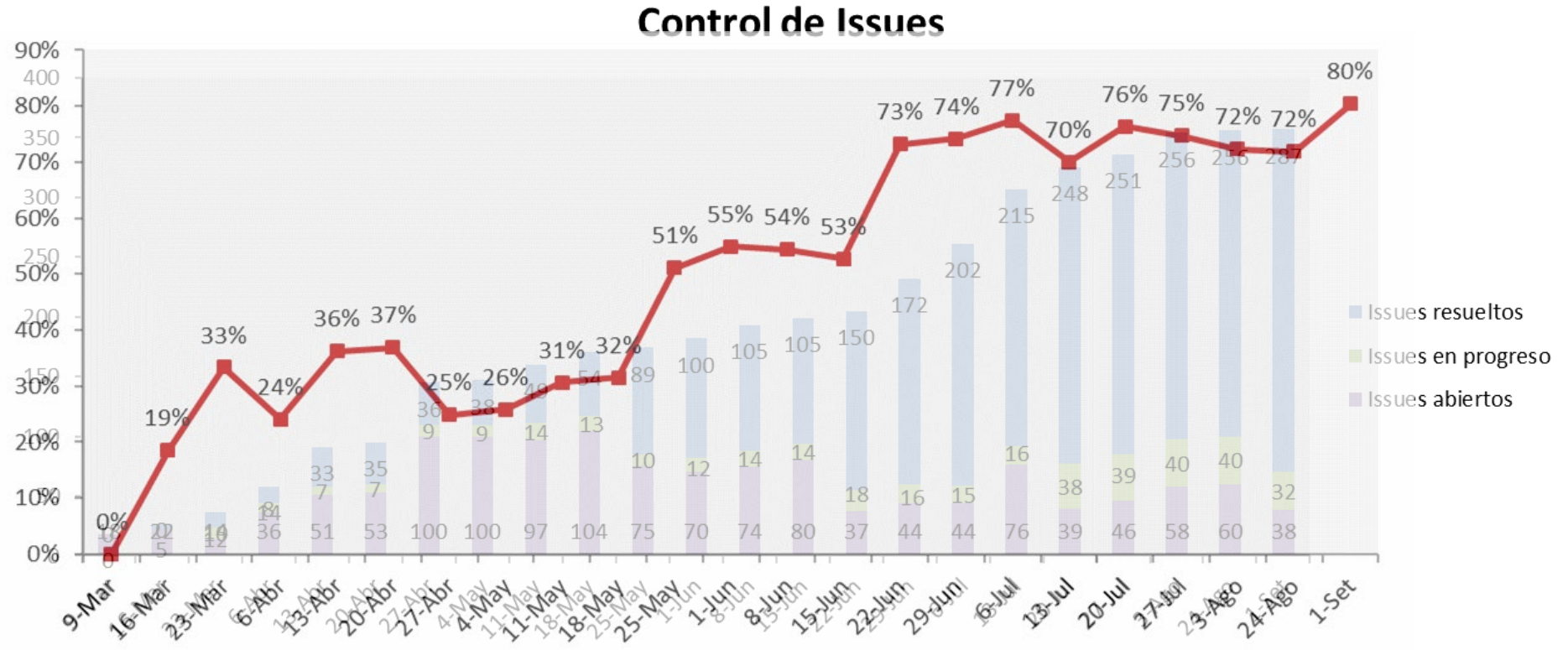
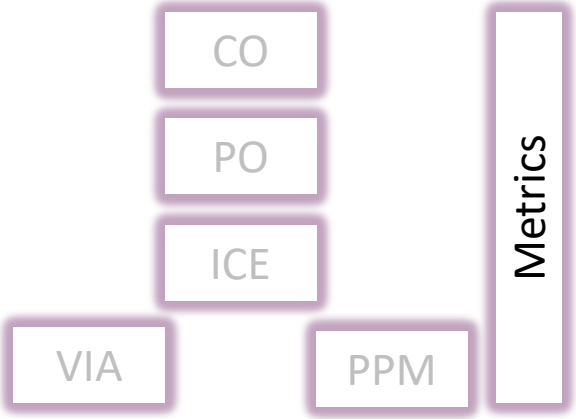
Design developed in the UK and Peru simultaneously. Thus, focus was on designing a process where the information was updated in real time helped by the cloud, having reliable information to make decisions.

= 2 sessions to design the process collaboratively  
+ 10 procedures developed to align all design participants

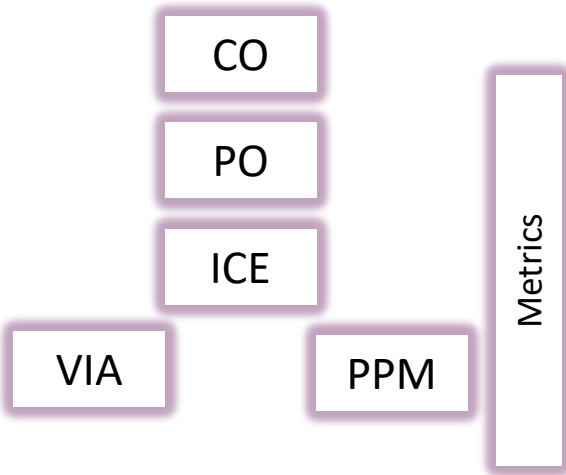
Daily meetings during the project kick-off to report progress and share obstacles.

+ 10 participants (design supervisors, design project managers, construction project managers, planner, BIM managers, procurement team)

# Metrics



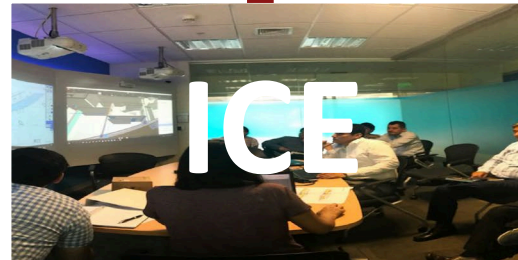
# Designing and building Olympic-level sports facilities really fast



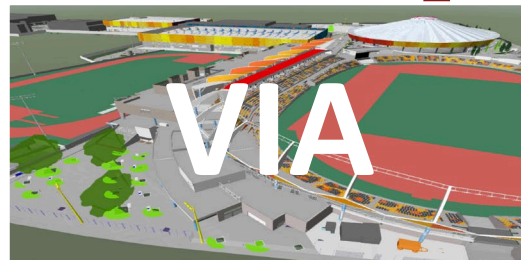
Have the sports facilities available for 1,800+ athletes from 33 countries to compete in 39 sports



Design and build 97,000 m2 of multi-sport facilities in 16 months



Resolve all issues (750 in total)  
Hold 2-hour ICE sessions each day for 10 weeks



Have CDE procedures that work across the UK and Peru  
Co-develop procedures to use the CDE



Resolve all design conflicts before construction (3,000 in total)  
60 discipline-level BIMs

# Global community of over 2,000 VDC-certified professionals

NTNU in Norway



FHNW in CH



ULima in Peru

# Flywheel Concept – “Schwungrad”



<https://en.wikipedia.org/wiki/Flywheel>

## A Lesson from a Former Student about Strategic Dynamics:

Jim Collins, *Turning the Flywheel*, HarperCollins, 2019, page 5:

“As Stanford Graduate School of Business strategy professor Robert Burgelman once observed to a classroom full of students in 1982 (of which I was one), the greatest danger in business and life lies not in outright failure but in achieving success without understanding *why* you were successful in the first place. Burgelman’s insight kept ping-ponging in my brain throughout my twenty-five years of research into the question of what makes great companies tick, especially in explaining why some companies fall from grace. When you deeply understand the underlying causal factors that give your flywheel its momentum, you can avoid Burgelman’s trap.”

Note: “Flywheel” is a good metaphor for developing a system of self-reinforcing strategic leadership activities that strengthens the company’s long-term ability to survive and thrive in its current product-market environment. In this course, such strategic leadership involves developing a “virtuous cycle.”

# The Amazon Flywheel



Rick Kettner, The Flywheel Concept from Good To Great by Jim Collins, <https://rickkettner.com/the-flywheel-concept/>, March 9, 2021

Sammen gjør vi en forskjell

# VDC-enabled Flywheels

FAGLIG  
DYKTIG

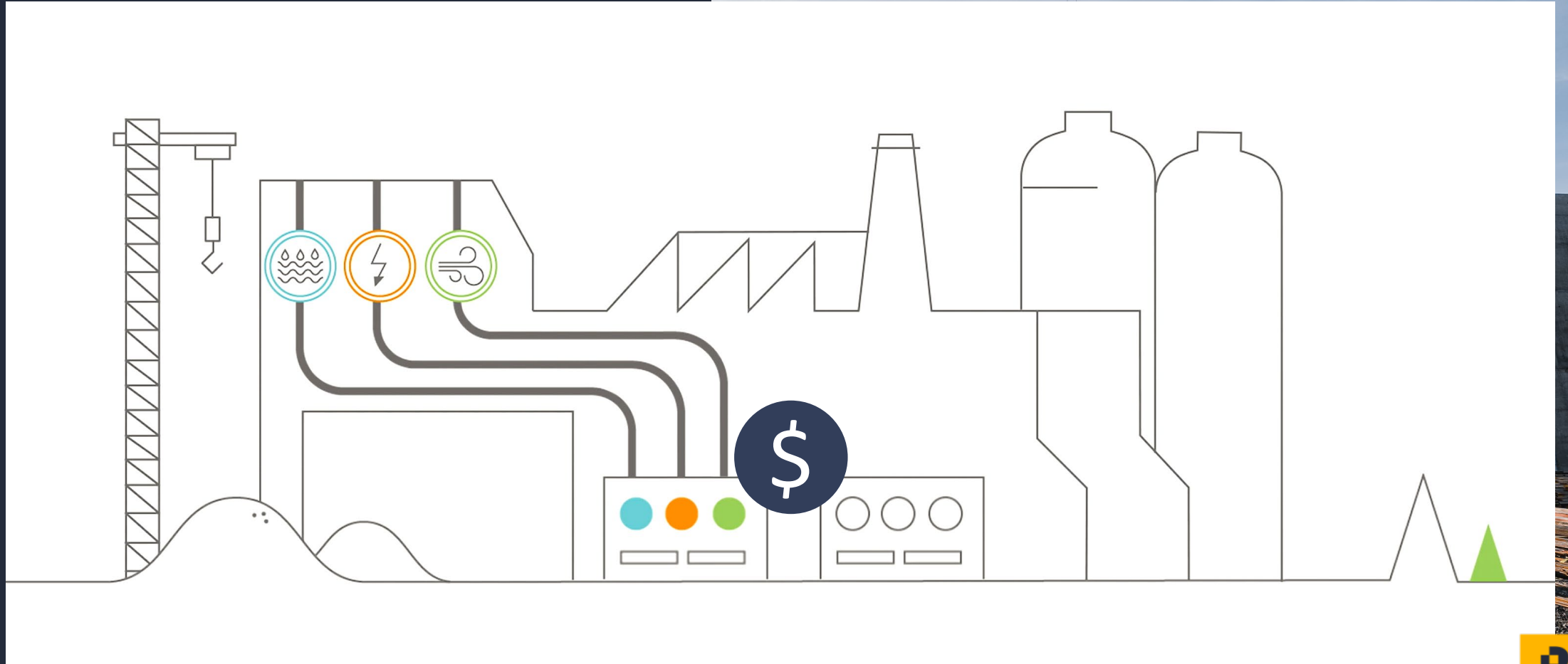
ÆRLIG

AMBISIØS

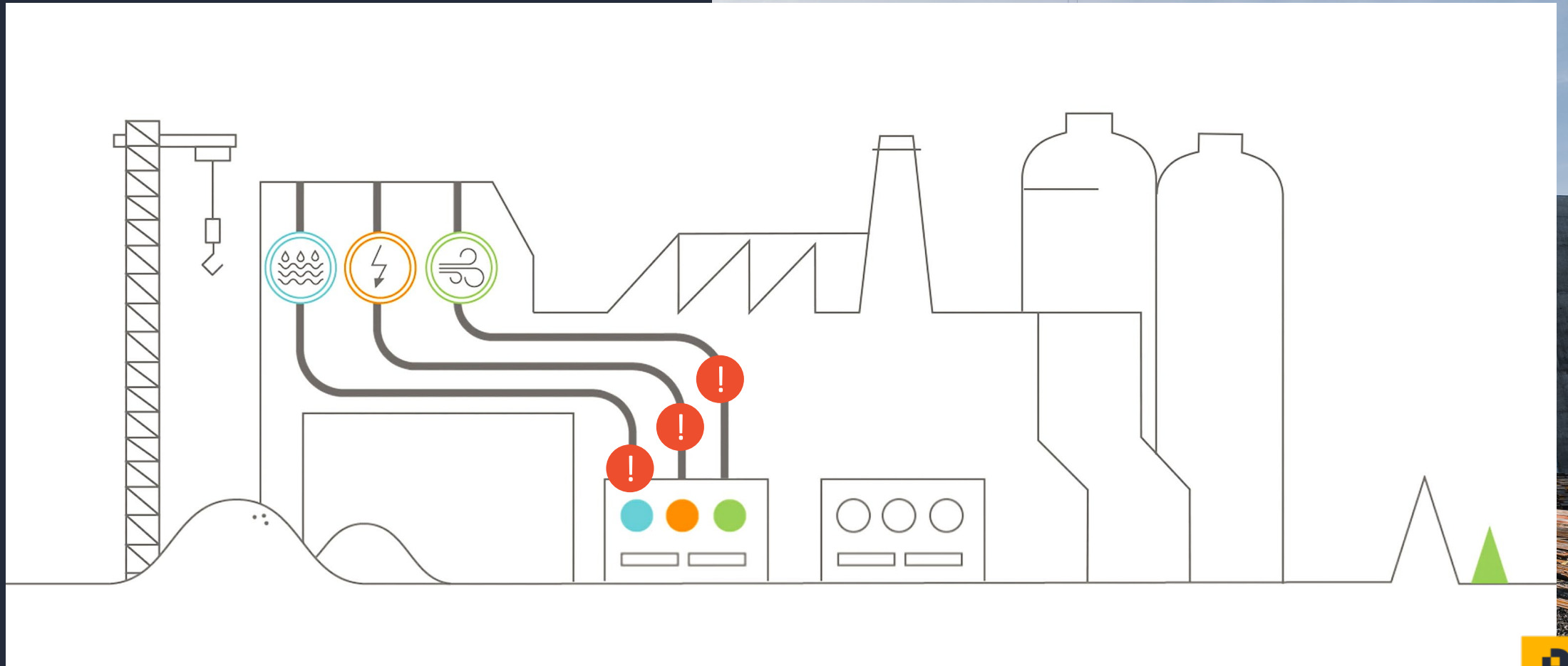
Johnny Rimestad Sætre – Project developer


May 4th 2026

# Industrial projects: Where is the value created for the clients?



Where do most costly errors and misunderstandings occur?



A person is holding a smartphone horizontally, displaying a 3D architectural rendering of a building interior. The rendering shows various rooms, corridors, and structural elements in different colors (blue, orange, green, white). The background is a blurred industrial or construction site.

## Why is interface management a challenge?

The people planning, designing and installing buildings and plant equipment come from different companies and teams from two different industries!

- Different workflows
- Different technology
- Different skillsets
- Different collaboration approaches
- Not assigned to the project at the same time
- Often no direct interaction
- Often no project target alignment (buildability vs. factory operations)
- Out of sync



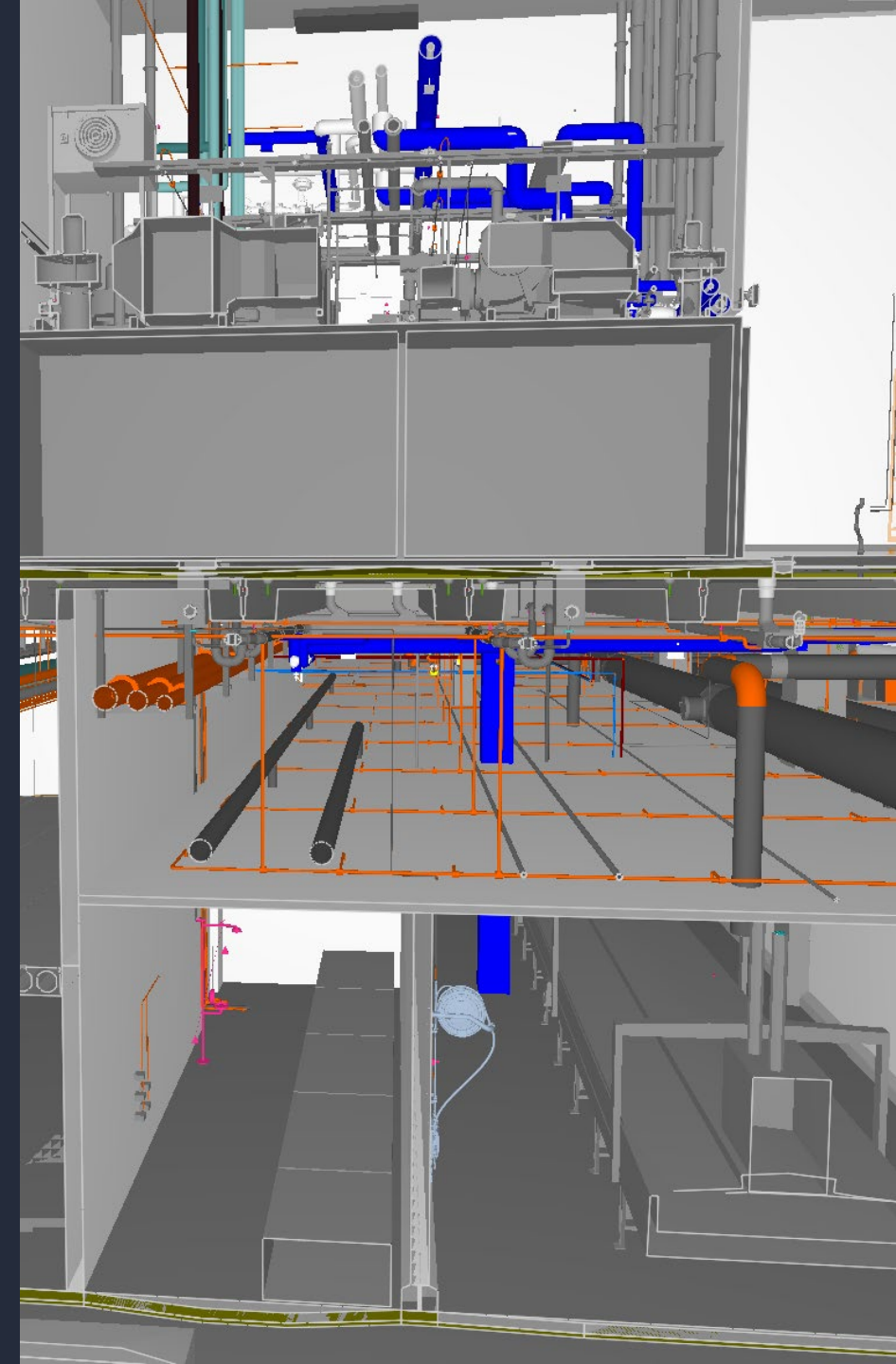


# Outcomes for the project owner

1. Factory operations 100% on day one
2. Project cost reduced (10% budget contingency unused)
3. One of the most complex designs and systems for poultry processing delivered on time
4. Design duration in detailed MEP design reduced (from 7 to 6 months)
5. Balancing hot water systems in testing stage reduced by 50%

# InterfaceBIM development outcome

1. InterfaceBIM concept deployed on 6 projects across industrial projects (battery factory, fish farming, medical equipment, data centers)
2. Provides competitive edge and better tool for Interface Management





## PROJECT EVOLUTION

UNLOCKING THE POTENTIAL

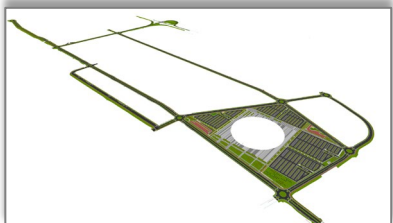
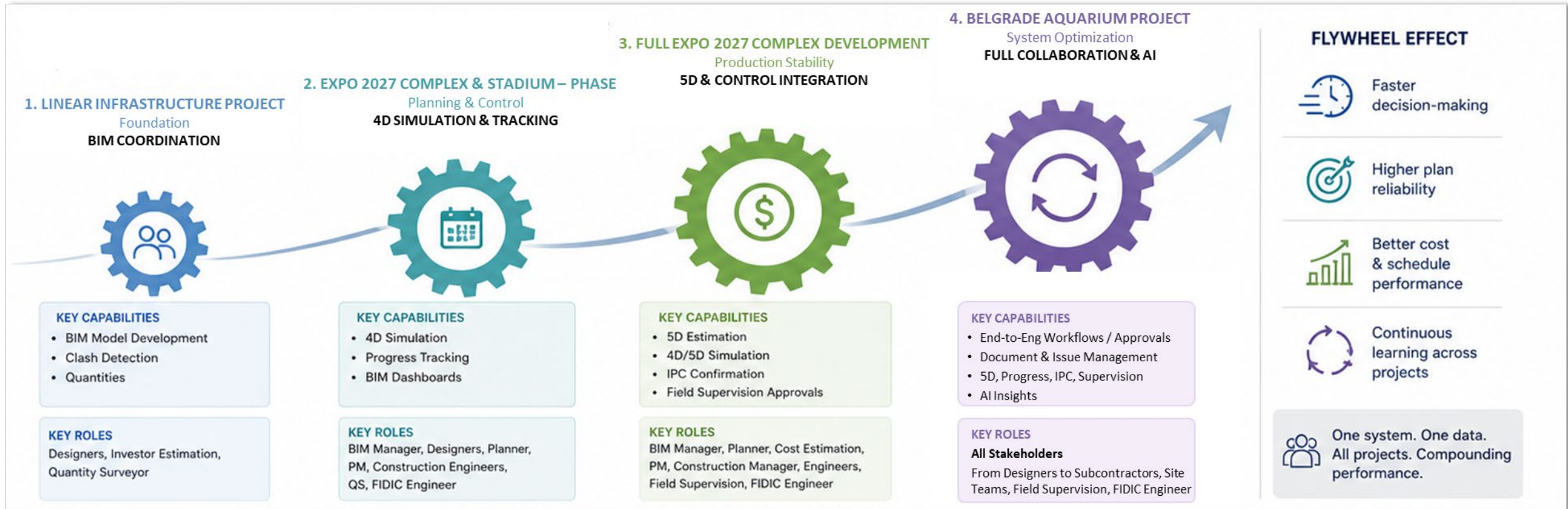
- 1 LINEAR INFRASTRUCTURE PROJECT**  
BIM COORDINATION (Models, Clash, Quantities) **DATA TRUST**
- 2 EXPO 2027 COMPLEX & STADIUM – PHASE 1**  
4D SIMULATION, PROGRESS TRACKING, DASHBOARDS **PLANNING & CONTROL**
- 3 FULL EXPO 2027 COMPLEX DEVELOPMENT**  
5D ESTIMATION, COST INTEGRATION, IPC CONFIRMATION, SUPERVISION APPROVALS **PRODUCTION & STABILITY**
- 4 BELGRADE AQUARIUM PROJECT**  
DOC. EXCHANGE & APPROVALS, ISSUE MNGM., BI & AI INSIGHTS **FULL COLLABORATION AI INSIGHTS CONTINUOUS IMPROVEMENT**

EXPO 2027 COMPLEX &  
NATIONAL FOOTBALL  
STADIUM COMPLEX

Powered by:

 BEXEL MANAGER

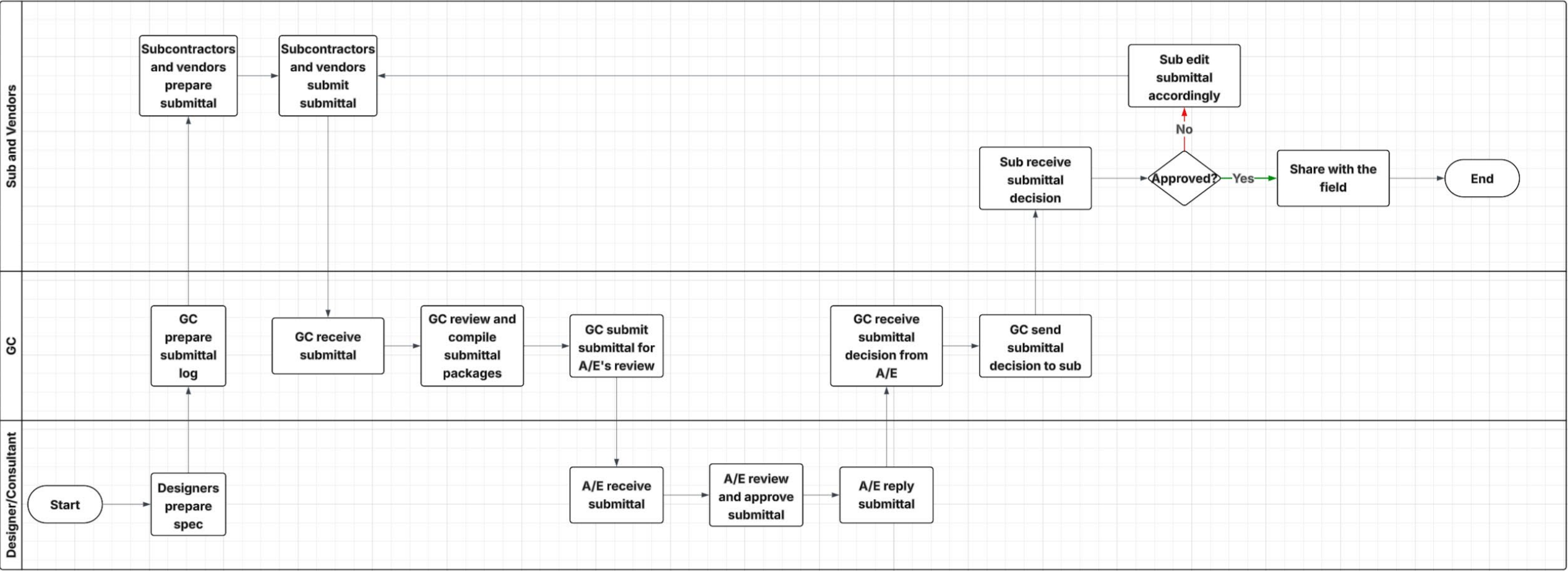
 BEXEL CDE



Powered by:

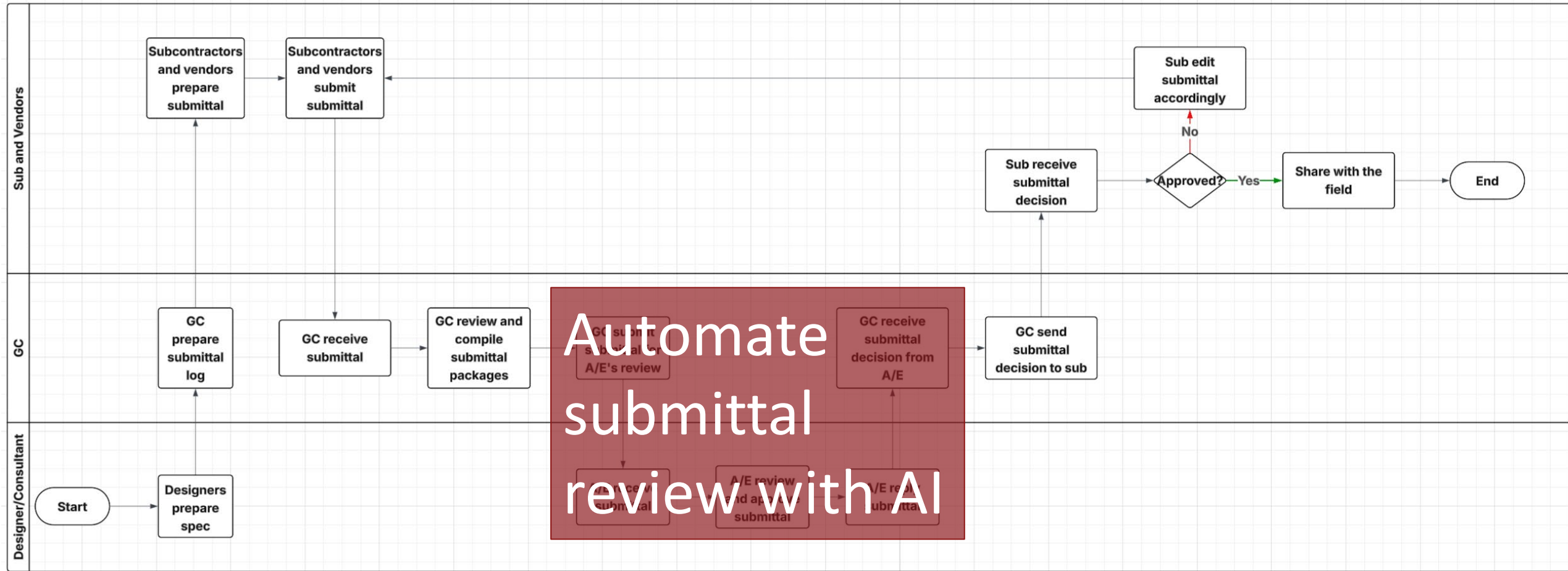


# Submittal review is one of the most important and “fun” processes for project engineers in the US



Work by Bochen Zhang in collaboration with Mortenson

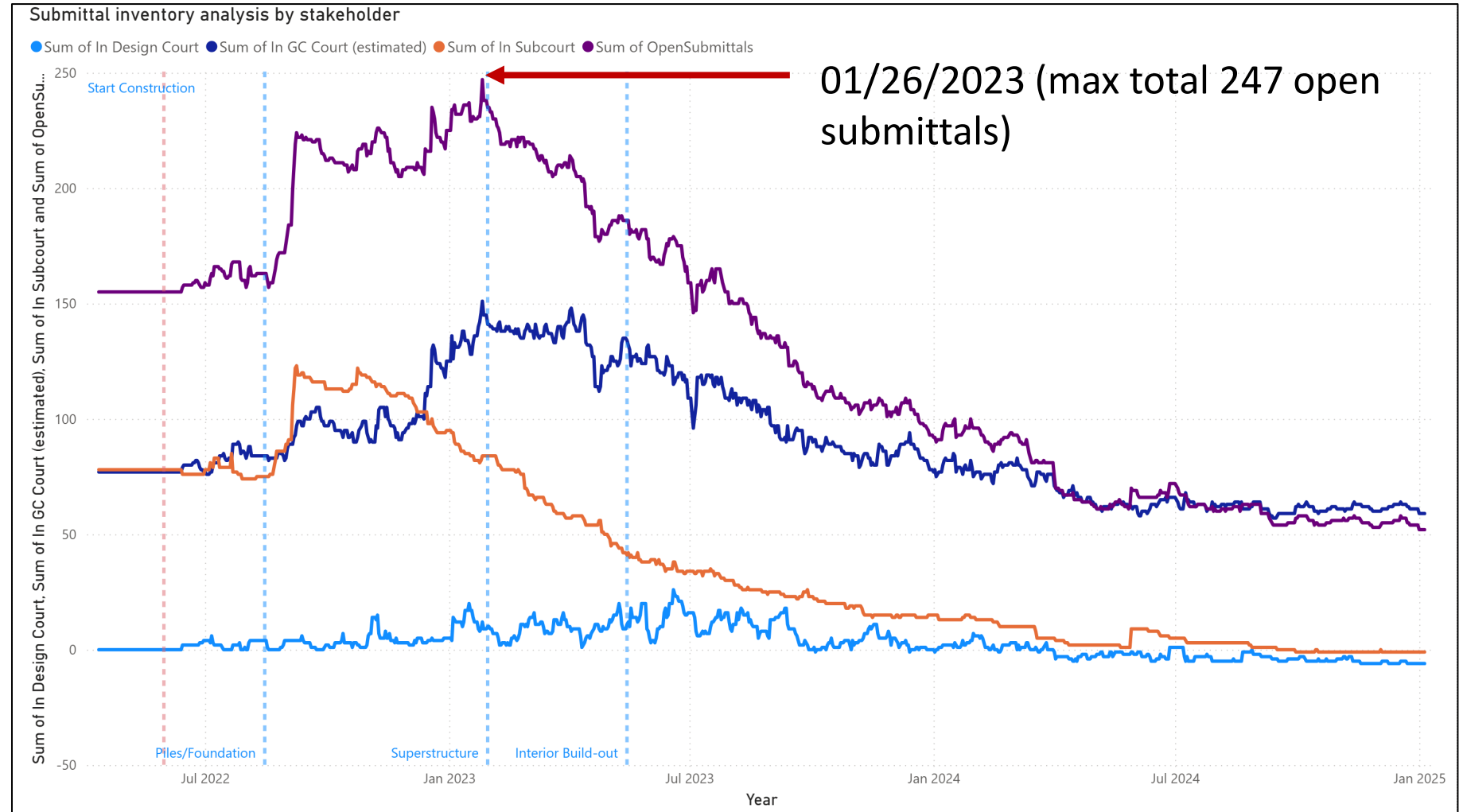
# Not to worry! There is AI!



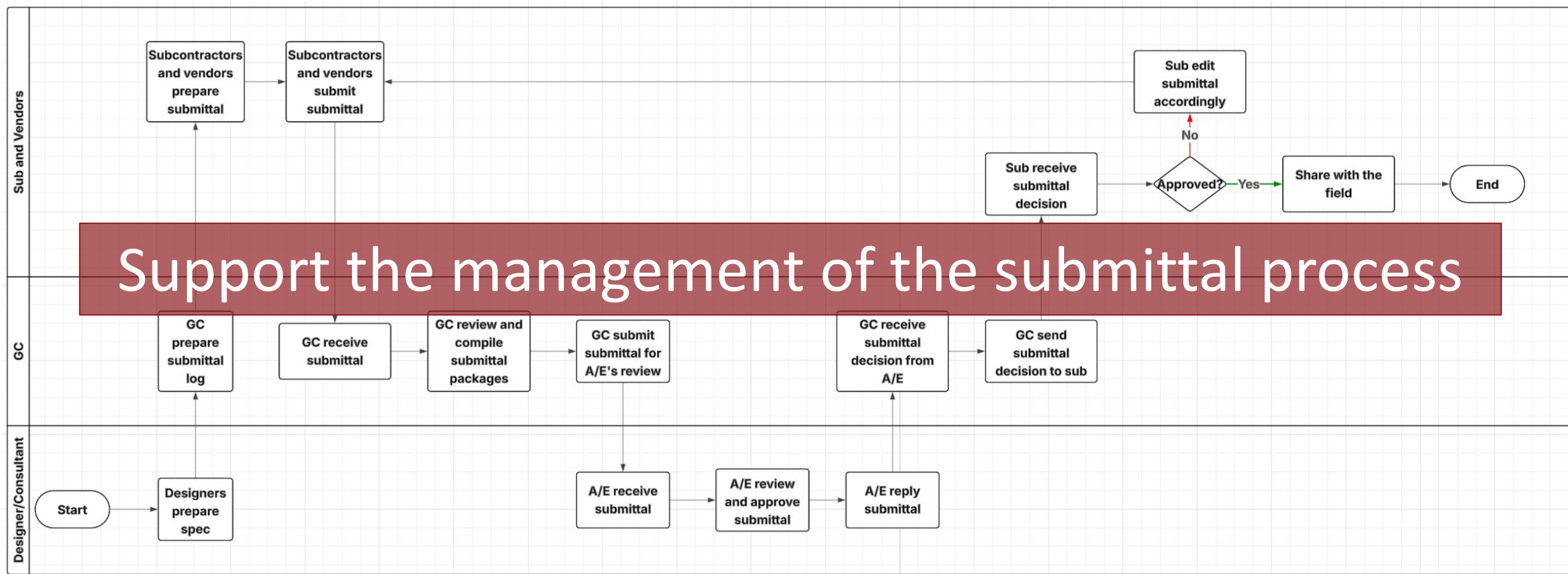
Work by Bochen Zhang in collaboration with Mortenson

# Work-in-process submittals throughout the project timeline

155 submittals created before the start of the project

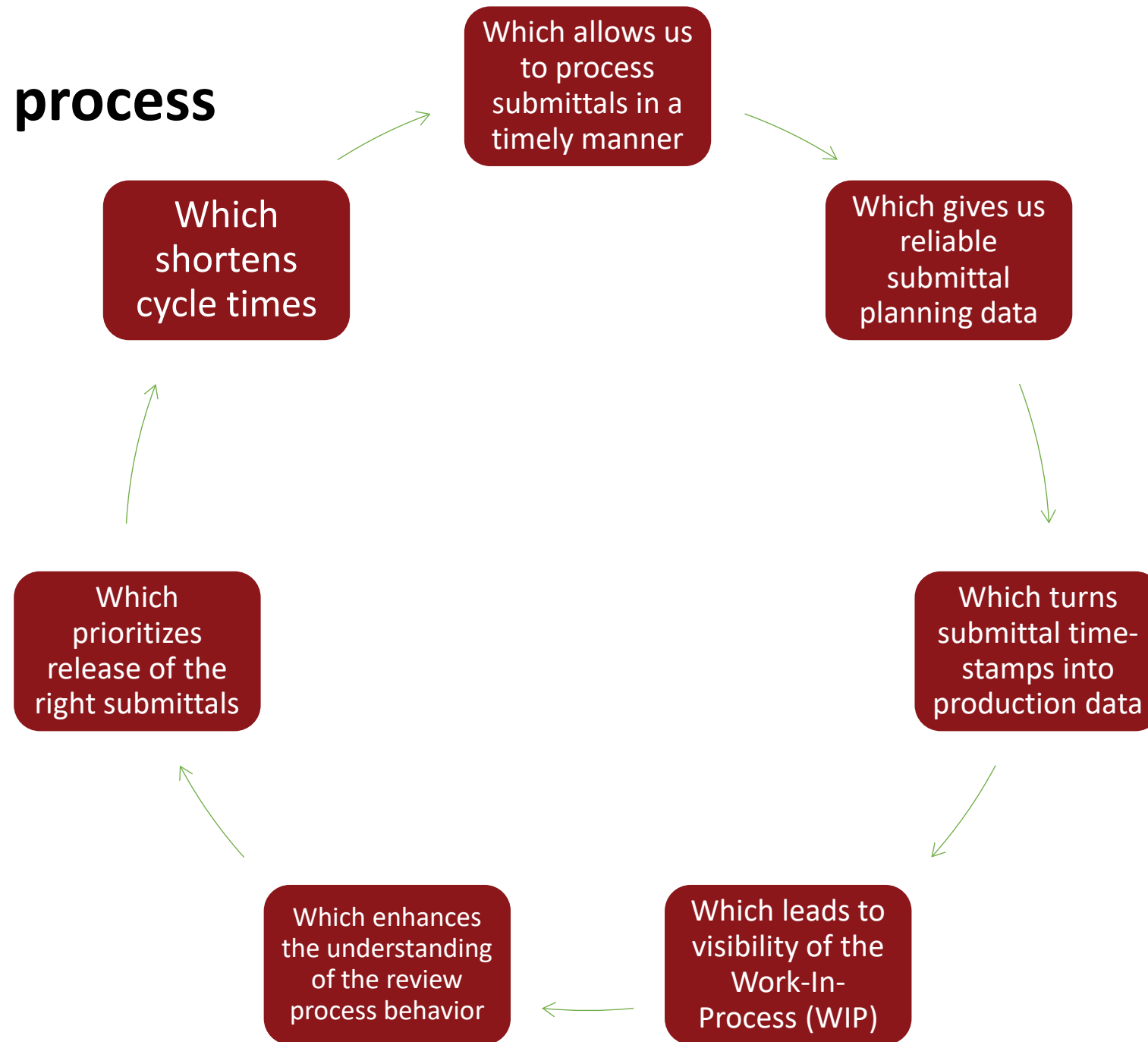


# Yes, there is AI ... but not for submittal review



Work by Bochen Zhang in collaboration with Mortenson

# Flywheel: Submittal review process

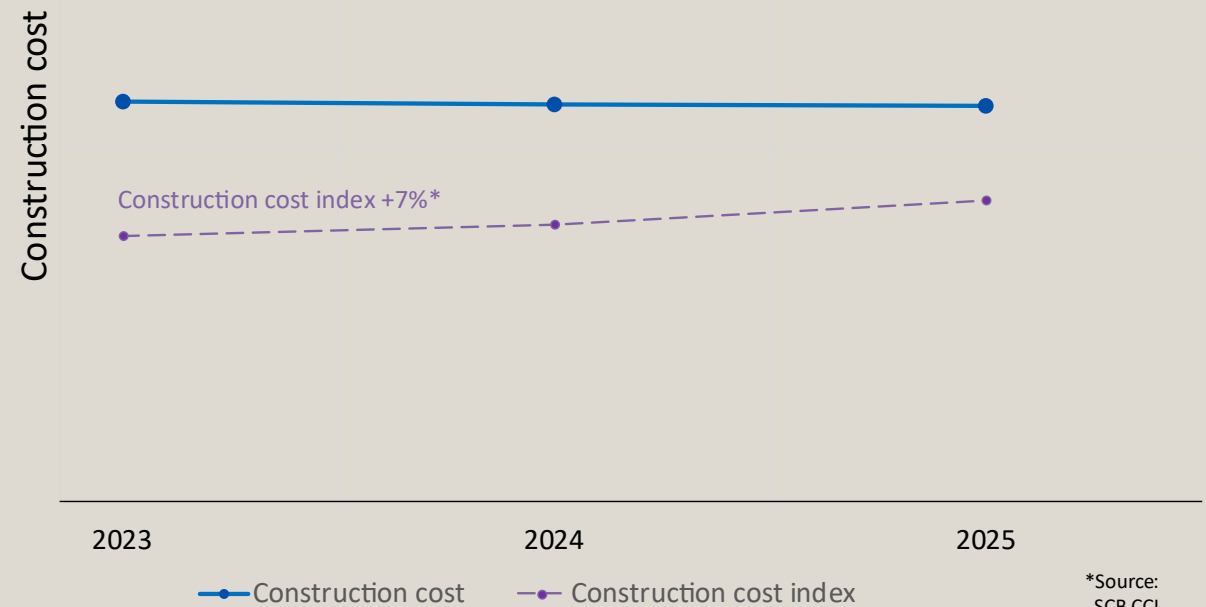


Välkomna till oss!

Max Tran

RESONA

# The challenge: Reduce design and construction cost by 30%



# Workshop Resona | mini-metrics of approved ONE-Solution ideas

157 Ideas

102 Approved



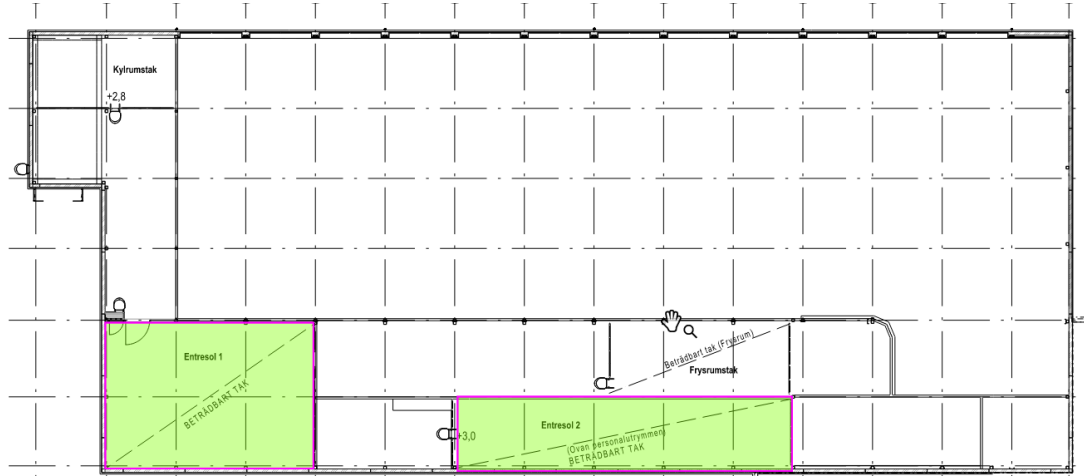
Should we have digital locks?

**Decision**  
**Yes**

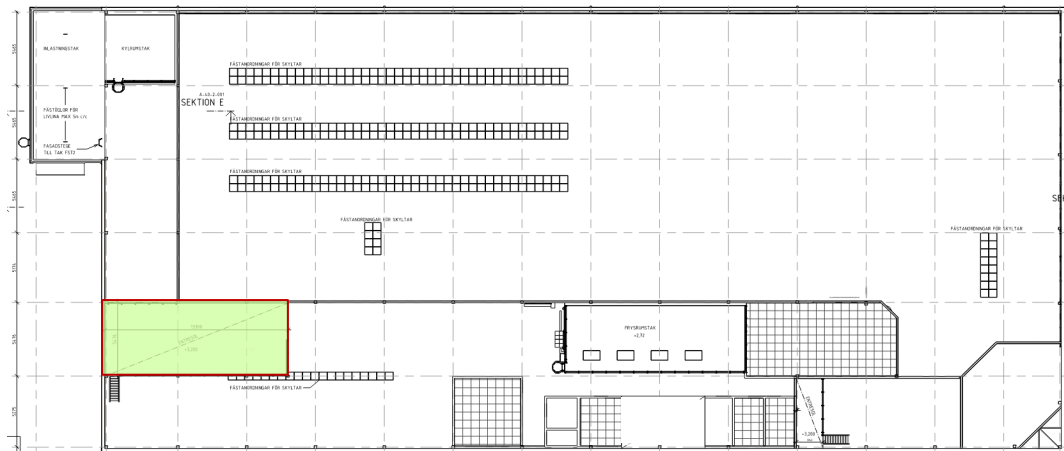
Should the windowsill  
be modelled 10 mm  
shorter than the window  
opening?

**Decision**  
**Yes**

# Lidl Example - Optimization Mechanical Room

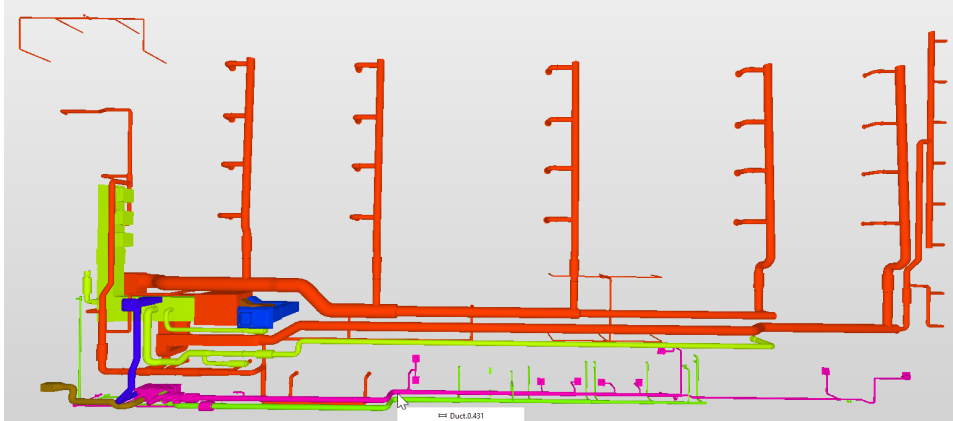


- Second floor
- 297 m<sup>2</sup>

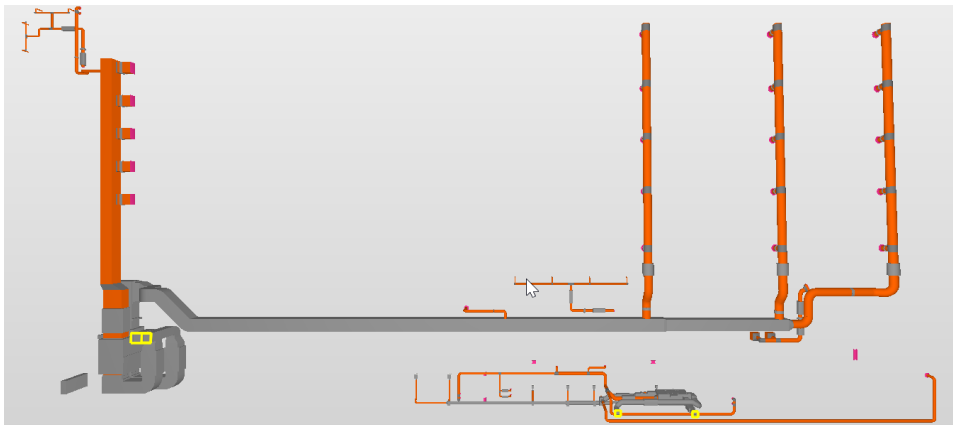


- Second floor
- 86 m<sup>2</sup> (-71%)

# Lidl Example – Ventilation System



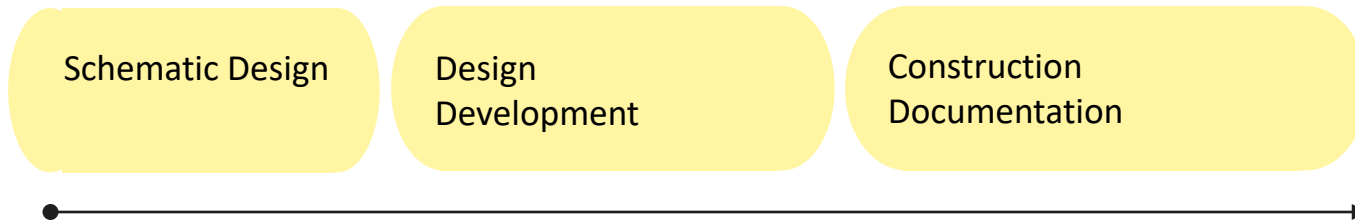
- Complicated system
- 6 fire dampers (12'000 €)
- 8 heat exchangers (8'000 €)



- Simple system
- 1 fire damper (2'000 €)
- 4 heat exchangers (4'000 €)

# ONE Design Process

Before



After



**18 → 5.5 months**

Design time (- 69 %)

**~10 → 2.2 days**

Average decision latency (- 78 %)

**12 of 708**

Revised decisions (1.7 %)

**6 → 3 months**

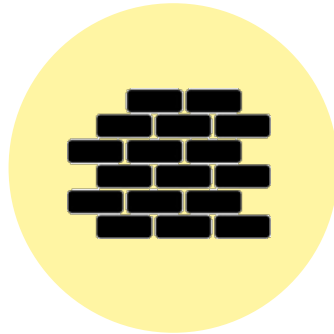
Permit lead time (- 50 %)

# Resona One Solution Implemented solutions



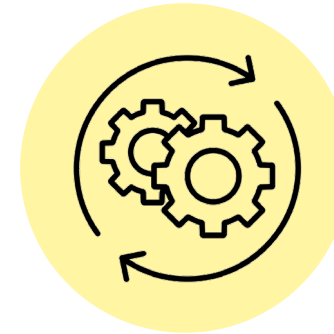
ONE CONTRACT  
TEMPLATE

37 -> 1 (-97 %)



ONE WALLTYPE

27 -> 13 (-52 %)



ONE DECISION  
ARENA

Chaos -> ONE Arena

# ONE noise requirement

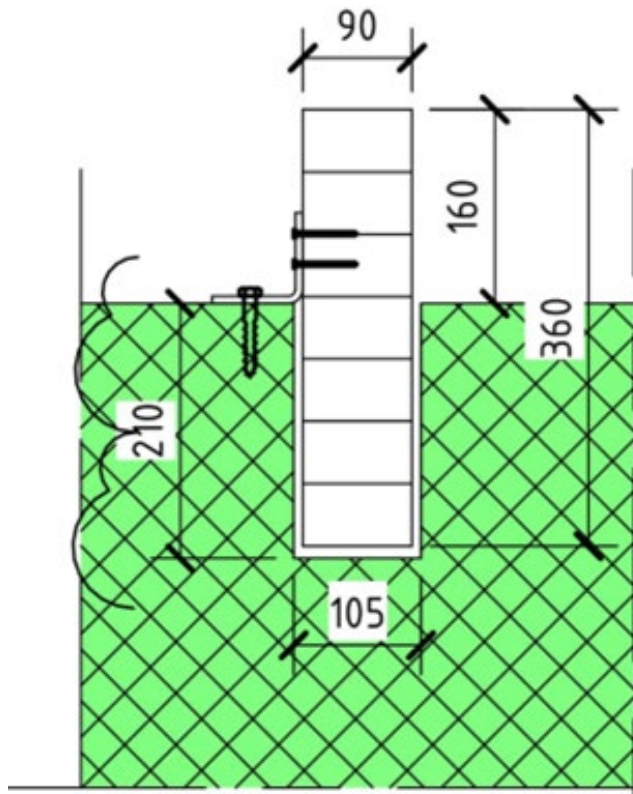


360 type of windows

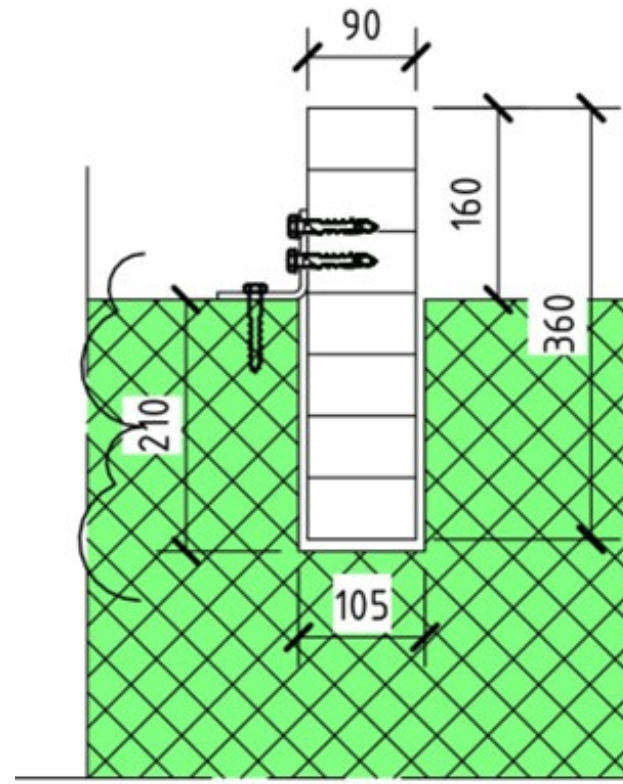


60 type of windows

# ONE type of screw

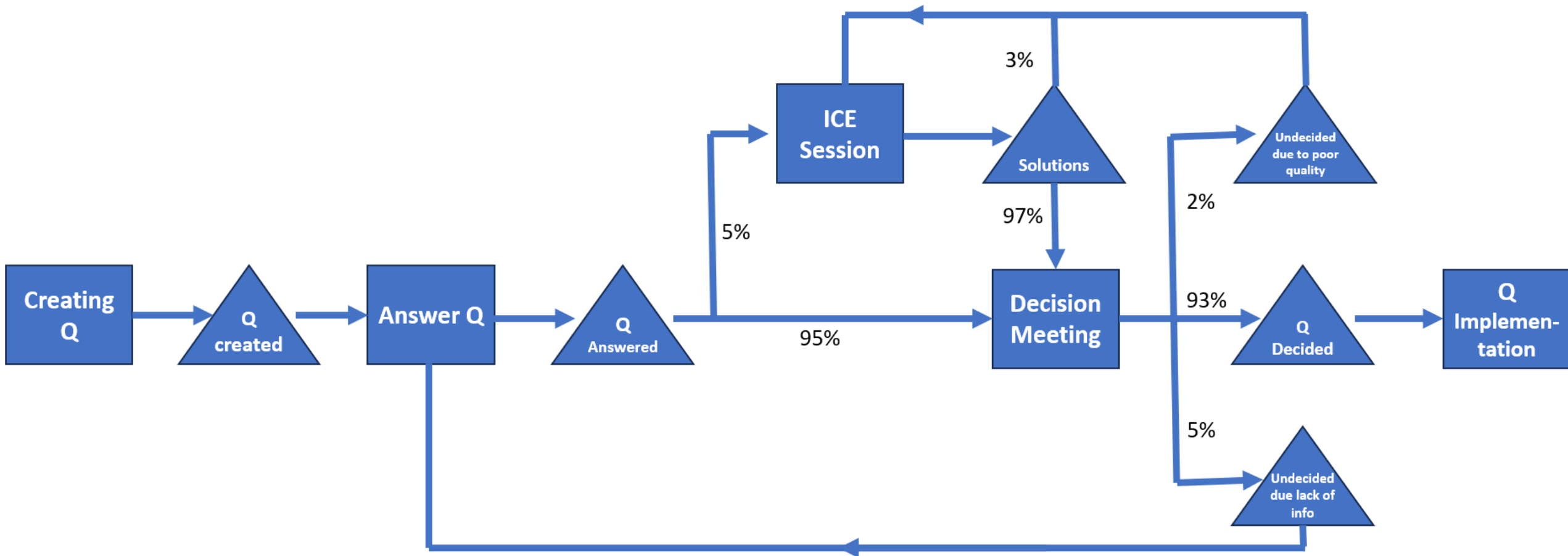


Screws & nails



Screws

# ONE Decision Process



## Before

Number of questions: 500-800  
Decision speed (latency): 9.5 days  
Decision variance: 1-16 weeks

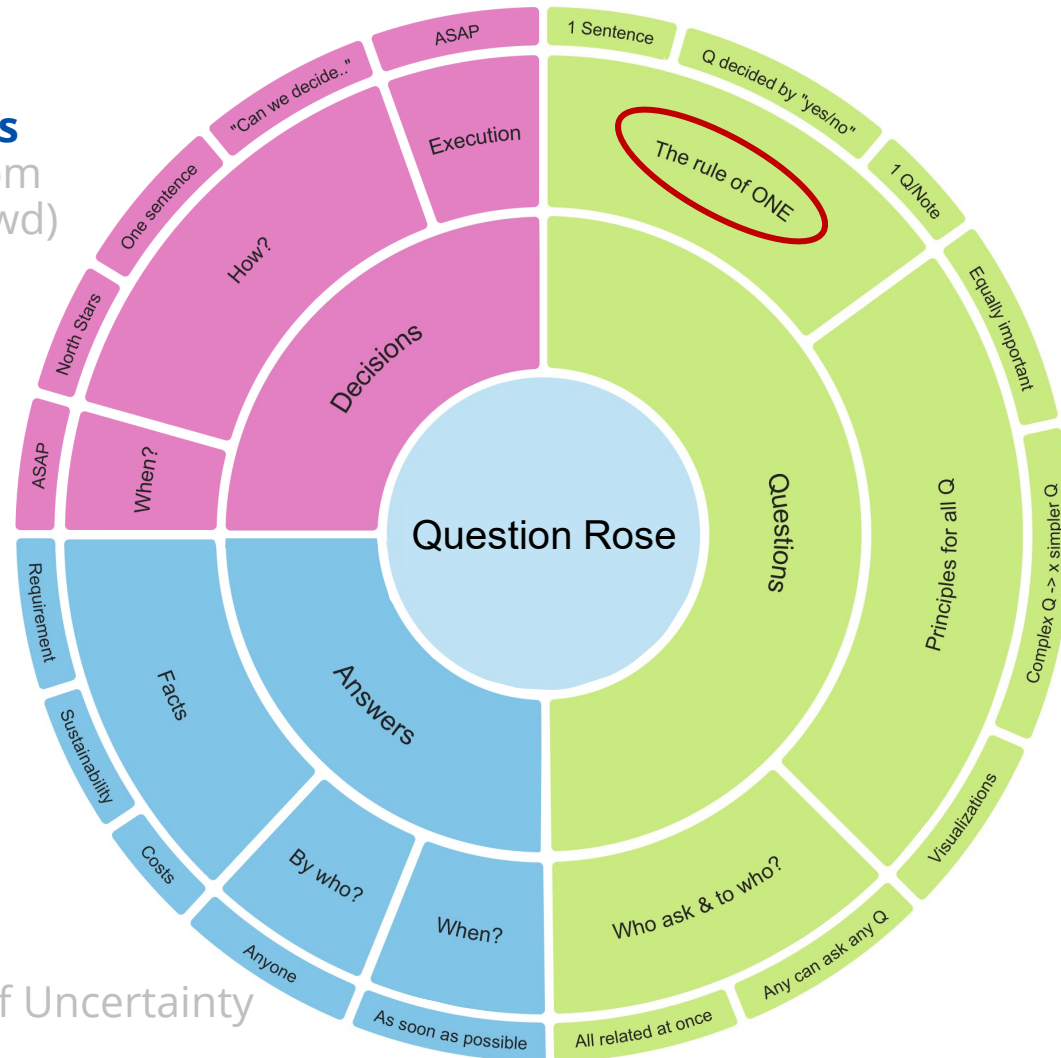


## Today

Number of questions: 150-200  
Decision latency: 1.1 days  
Decision variance: 1-5 days

# ONE Question to improve communication

**3 Decisions**  
(The Wisdom of The Crowd)



**1 Questions**  
(The Law of Least Resistance)



**2 Answers**  
(The Law of Uncertainty Reduction)

# ONE Question example

## Current practice

Avstånd överkant hål fönster och underkant ovanliggande bjälklag är på en mycket stor del av fönstren 190 mm. Övriga mått: Våningshöjd 2500 mm, bröstningshöjd 600 mm, hålmått fönster 1710 mm.(Se bifogad bild)

Enligt "projekteringshandbok Arkitekt" sid.27 så är minsta mått mellan hål och överkant vägg 300 mm. Detta tolkar jag som att avståndet hål och u.k. bjälklag ska vara min 300 mm. Måttet 300 mm står också som minimimått på sid. 10 i "Guide prefab betongstommar.

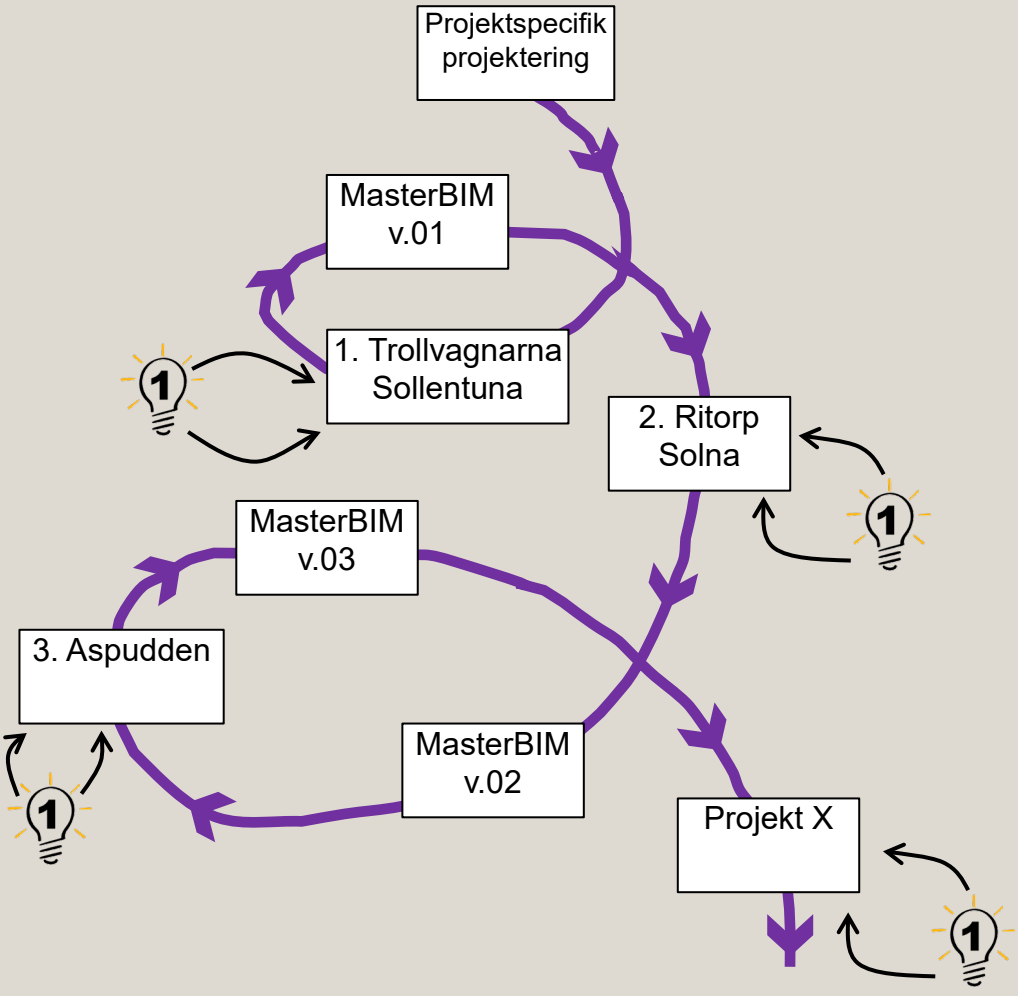
Är det något problem eller fungerar det som det är ritat nu, d.v.s. 190 mm mellan fönsterhål och u.k. bjälklag? Om det fungerar, har det några fördyrande konsekvenser för produktionen såsom dyrare att producera, transportera eller montera j.m.f. om det hade varit 300 mm ovanför hål?



## Q-Rose Practice

Kan vi ha 190 mm betong mellan överkant fönster och takbjälklag?

# ONE MasterBIM



Sollentuna



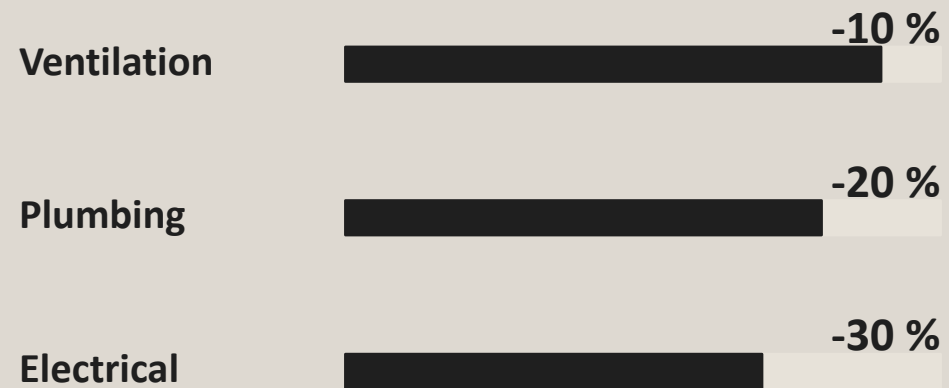
Ritorp, Solna

Aspudden



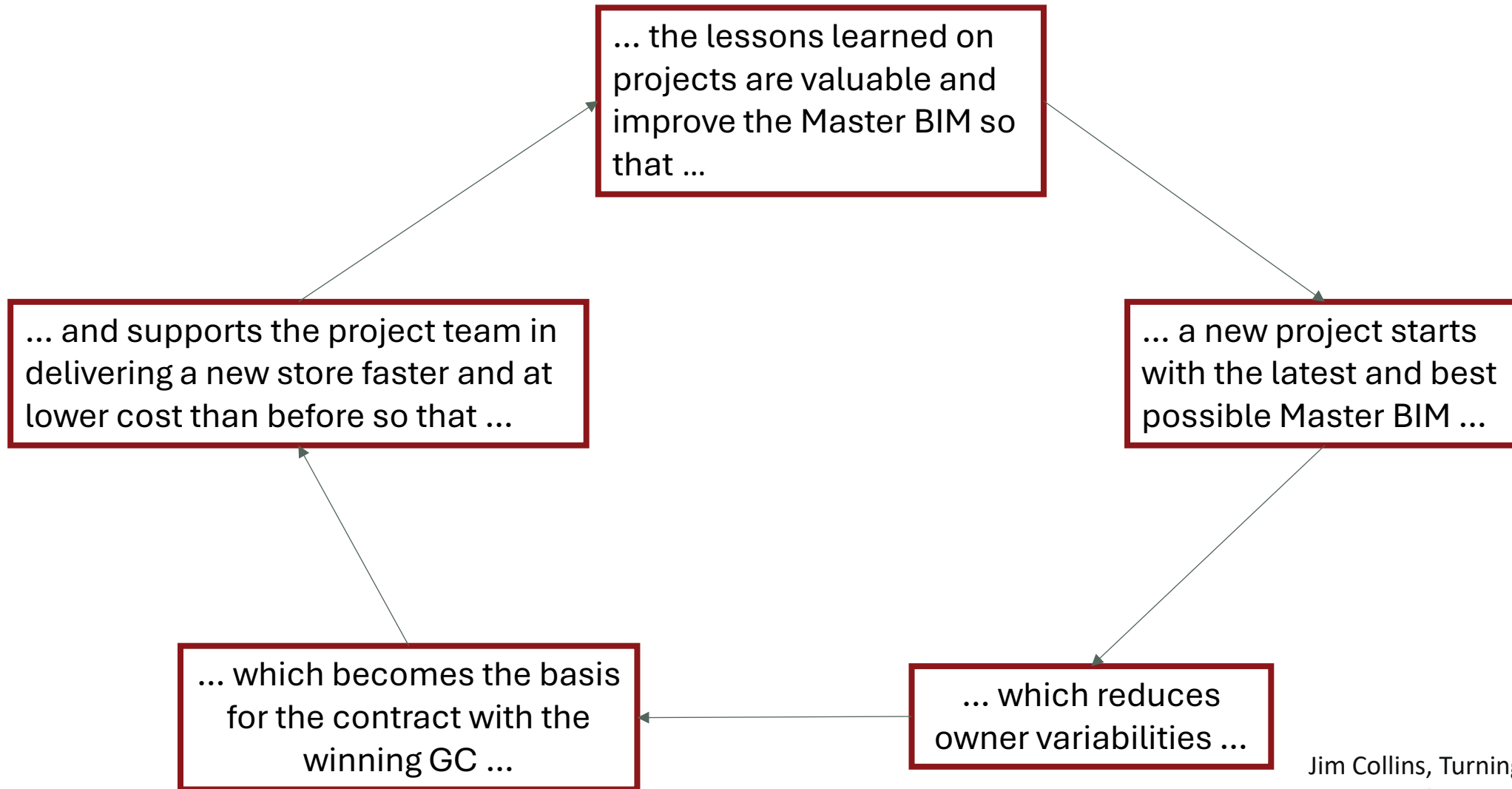
# Radical Procurement Results

## Contract prices compared to budget



**Cost – 20 %**  
Average cost reduction

# Flywheel to keep improving cost and schedule of new stores



Jim Collins, Turning the Flywheel: A Monograph to Accompany Good to Great

From Many to ONE-Solution

*Turning Complexity into Simplicity in Construction*

RESONA

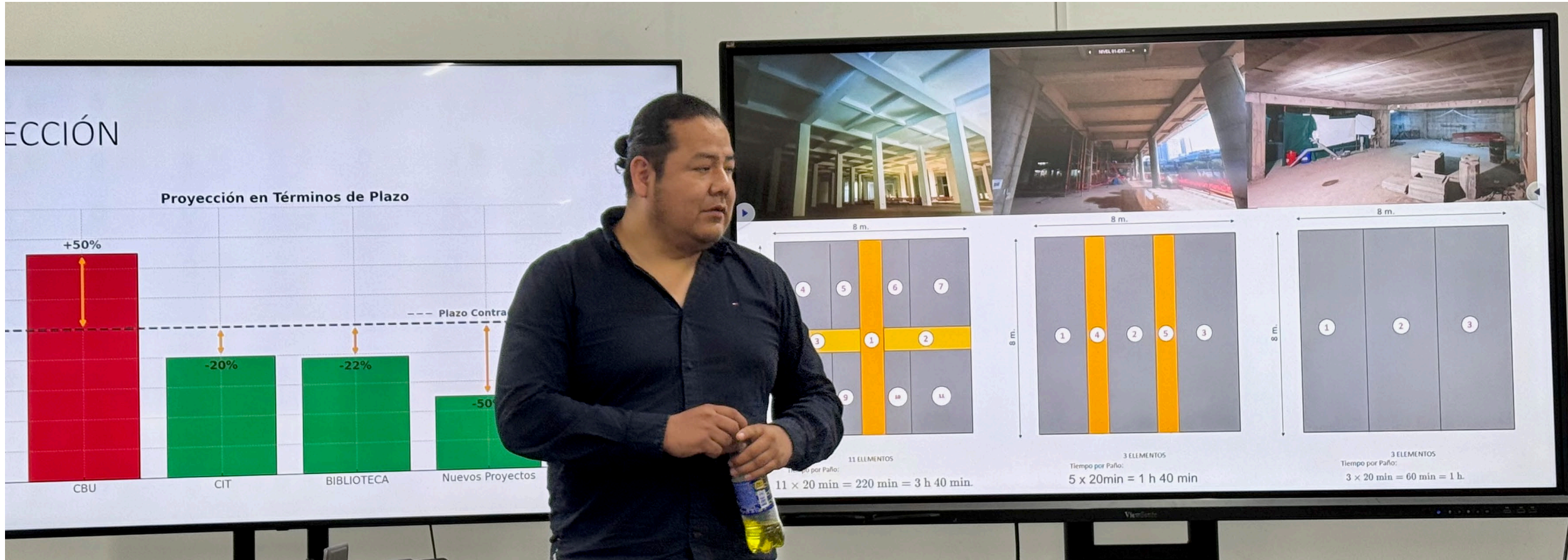
# 18,200 m<sup>2</sup> library constructed in 12 months with 30,000 students around



Omar Alfaro, Project Manager and Head of Integrated Project Division for COSAPI

About 100 key project staff co-located on site  
24 of them VDC-certified

# Improvements over three projects with VDC



Project duration reduced by 67%.

Installation of precast slabs shortened by 73% per bay.



# Koskela Tram Depot





**Severi Särkilahti**  
*Development Manager*

***”The Finnish VDC-guys”***



**Teemu Saarinen**  
*Design Manager*

# Akseli alliance project information

## Client

- **Metropolitan Area Transport Ltd**  
(Pääkaupunkiseudun Kaupunkiliikenne Oy)



## Design team

- Lead designer, architecture and interior design:  
**Arkkitehtiyöhuone APRT Oy**
- Structural, track, fire, yard, signalling, life cycle and geotechnical planning :  
**Sweco Finland Oy**
- HVAC, sprinkler and energy:  
**Rejlers Rakentaminen Oy**



## Alliance partners

- Track installation, track electrics, foundations and circular economy: **Kreate Oy**
- Frame structures: **Lujabetoni Oy**

## Size

- Approx. 41 000 m<sup>2</sup>
- Approx. 5,3 km of track

## Contractor

- **Skanska Infra Oy**
- **Skanska Talonrakennus Oy**

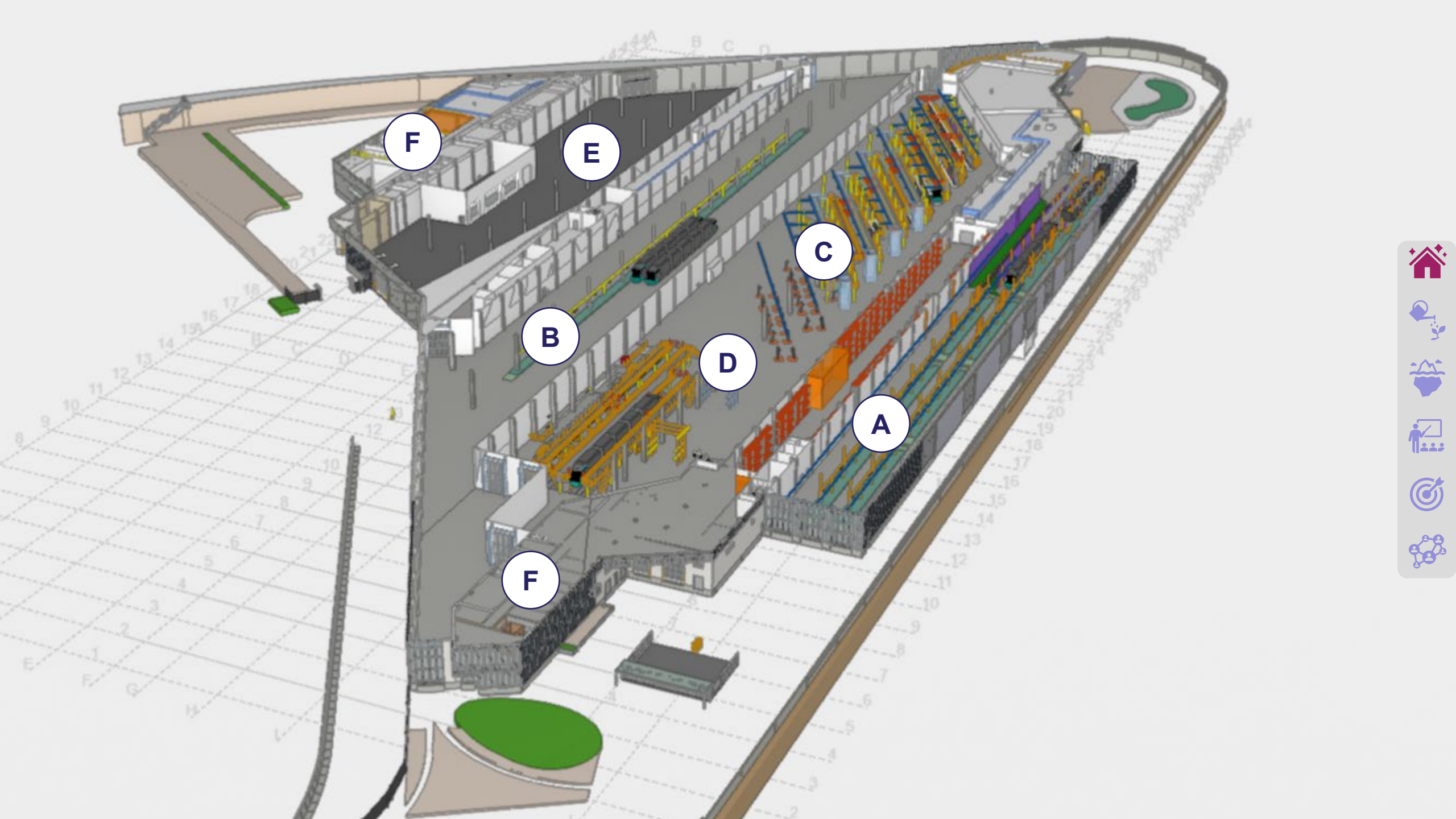
## Contract type and target cost:

- Alliance contract
- Target cost **282,4 M€**

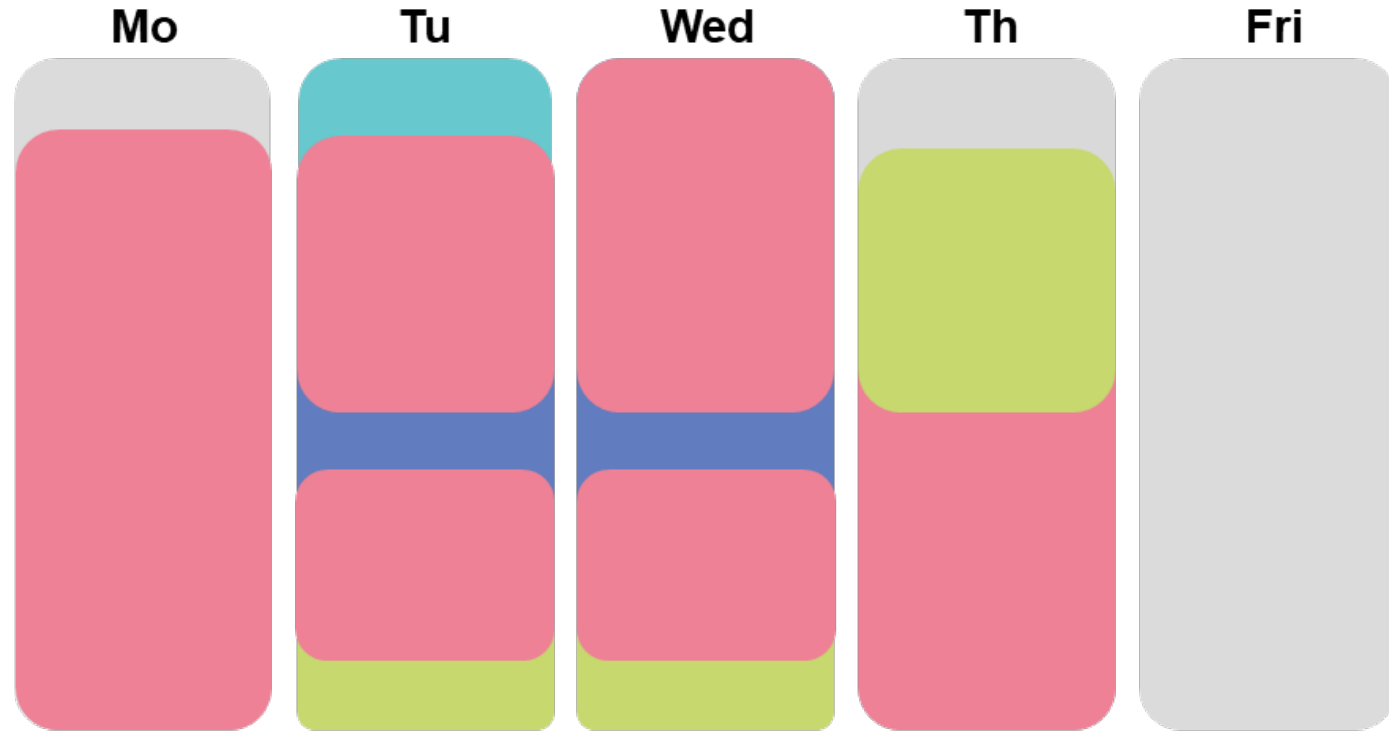


6.5.2026





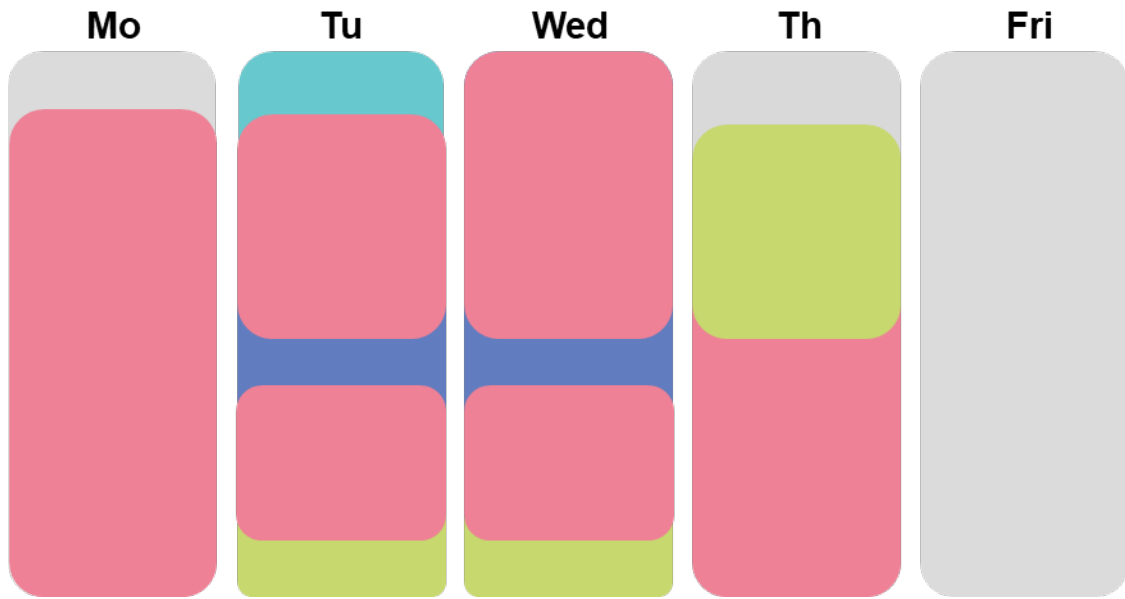
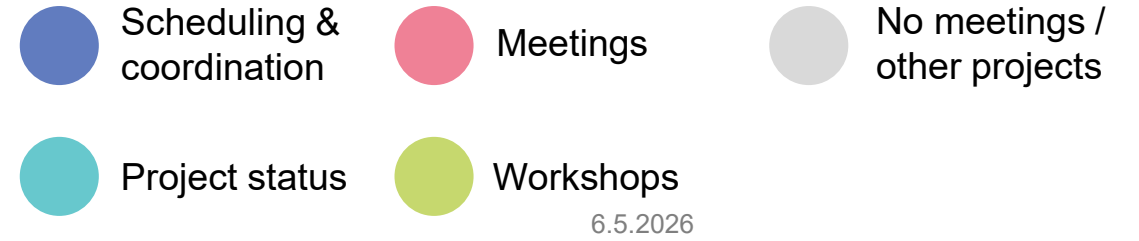
# Things were not running smoothly at the start...



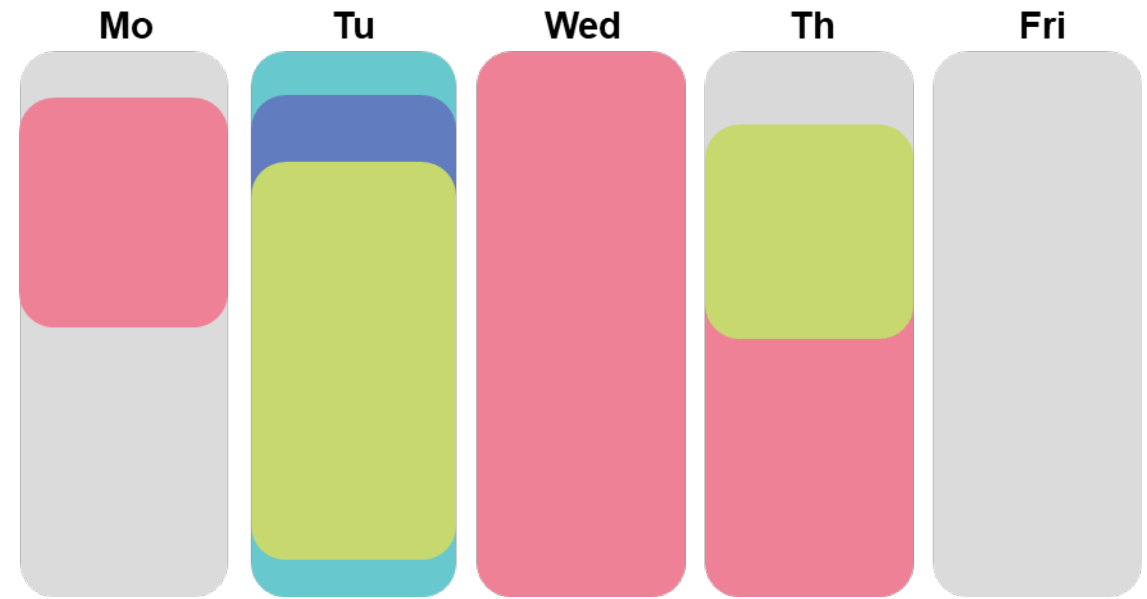
**We flew in a  
Norweagian to help...**



# Two weekly rhythms side by side



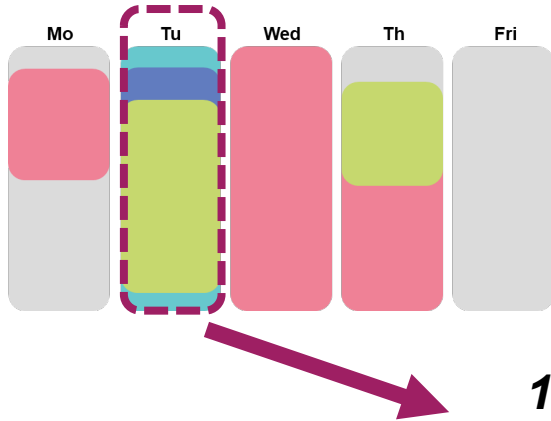
OLD



NEW

62

# Organizing ICE-days



Introduction to today's ICE sessions

**10-11**

1.1

1.2

1.3...

**12-13**

2.1

2.2

2.3...

**13-14**

3.1

3.2

3.3...

**14-15**

4.1

4.2

4.3...

Reflecting on the ICE sessions



*Sharing information about the topics to be solved during the day with everyone*



*Solving topics efficiently and multi-disciplinarily*



*Reflecting on the solutions and the big picture together*

# ICE-days and agendas are in Monday.com

Tiistai: SESSIOT 1 (10:00-10:50)		ICE-Päivä			Osallistujat	Tavoitteen saavutus	Tarvitaanko jatko-ICE?
3 Sessios / 4 Subitems		Feb 24				<div style="width: 100%; height: 10px; background-color: green;"></div>	<div style="width: 100%; height: 10px; background-color: blue;"></div>
<b>Tiistai: SESSIOT 2 (12:00-12:50)</b>							
Sessio	ICE-Päivä	Session vet...	Session tavoite	Osallistujat	Tavoitteen saavutus	Tarvitaanko jatko-ICE?	
2.2 Tuotannon parhaiden käytäntöjen ja tilannekuvan kartoitus	Feb 24		Kartoitetaan olemassa olevia hyviä käytäntöjä...		<div style="width: 100%; height: 10px; background-color: green;"></div> SAAVUTETTU	<div style="width: 100%; height: 10px; background-color: blue;"></div> EI TARVITA	
2.1 Talon sisäpuolisten mittauksien käytäntö ja ohjeistus 3	Feb 24		Sovitaan tilaajan kanssa talon sisäpuolisten m...		<div style="width: 50%; height: 10px; background-color: orange;"></div> OSITTAIN	<div style="width: 100%; height: 10px; background-color: blue;"></div> EI TARVITA	
2.3 Koskelantien tukimuurin kunnostustoimenpiteet	Feb 24		Varmistetaan yhteinen näkemys Koskelantien...		<div style="width: 100%; height: 10px; background-color: green;"></div> SAAVUTETTU	<div style="width: 100%; height: 10px; background-color: blue;"></div> EI TARVITA	
+ Add sessio		Feb 24				<div style="width: 50%; height: 10px; background-color: green;"></div>	<div style="width: 100%; height: 10px; background-color: blue;"></div>
<b>Tiistai: SESSIOT 3 (13:00-13:50)</b>							
Sessio	ICE-Päivä	Session vet...	Session tavoite	Osallistujat	Tavoitteen saavutus	Tarvitaanko jatko-ICE?	
3.1 Akselin käyttöönotto- ja luovutusvaiheen alustava valmistelu (mm.. vastu...	Feb 24		Akselin käyttöönotto- ja luovutusvaiheen alus...		<div style="width: 100%; height: 10px; background-color: green;"></div> SAAVUTETTU	<div style="width: 100%; height: 10px; background-color: blue;"></div> EI TARVITA	
3.2 Lattiapinnoitteet 5	Feb 24		Tilannekatsaus ja jatkotoimenpiteiden sopimi...		<div style="width: 100%; height: 10px; background-color: green;"></div> SAAVUTETTU	<div style="width: 100%; height: 10px; background-color: blue;"></div> EI TARVITA	
+ Add sessio		Feb 24				<div style="width: 100%; height: 10px; background-color: green;"></div>	<div style="width: 100%; height: 10px; background-color: blue;"></div>
<b>Tiistai: SESSIOT 4 (14:15-15:05)</b>		ICE-Päivä			Osallistujat	Tavoitteen saavutus	Tarvitaanko jatko-ICE?
3 Sessios		Feb 24				<div style="width: 100%; height: 10px; background-color: green;"></div>	<div style="width: 100%; height: 10px; background-color: blue;"></div>
<b>Torstai: SESSIOT 5 (10:00-10:50)</b>		ICE-Päivä			Osallistujat	Tavoitteen saavutus	Tarvitaanko jatko-ICE?
3 Sessios / 8 Subitems		Feb 26				<div style="width: 50%; height: 10px; background-color: green;"></div>	<div style="width: 50%; height: 10px; background-color: blue;"></div>



# All design tasks are in Monday.com → no more email silos

2.1 Tehtäväratkaisutaulu - MAX

Main table 002. ARK-RAK ... 010. Lupaehdot/pääsu... 004. RAK-tuotanto-LU... 011. Infra-Rata 012. TATE 005. RATA Hoyluun 008. GEO

New kysymykset Search Person Filter / 3 Sort Hide Group by

> Välliehden työryhmä, kuvaus ja kokoontumisajankohta	1 Kysymykset			Työryhmä	ARK-RAK
> Tehtävälöki	3 Kysymykset			Työryhmä	
Työryhmissä käsiteltävät tehtävät					
Kysymykset	Kysyjä	Vastausta odotetaan	Työryhmä		
Lokasäiliötilan päälle varaus välipohjarakenteelle. Muuntojousto...	May 20, 2025		ARK-RAK		
VRK-huoltohallin terästolpat hyödykepisteille	Jun 17, 2025		ARK-RAK TATE		
Kalustohallin pohjoispään sisäänajo	Oct 6, 2025	MS	ARK-RAK		
Vesikatkon alipainetuulettimien sijainnit	Oct 14, 2025	MS	ARK-RAK		
Raitiovaunujen ulosajon katos - palomuuuri - lasiseinän liittyminen...	Oct 17, 2025		ARK-RAK		
> Täydentävät teräsrakenteet listaus 26	Oct 21, 2025		ARK-RAK		
Muurattujen seinien yläpäiden liitokset TT-laatastoon vai huon...	Oct 27, 2025		ARK-RAK		
Taiteseinän tuenta kokouksissa	Nov 12, 2025		ARK-RAK		
> Pintalattioiden suunnittelu 20	Jan 31, 2025		RAK-tuotanto ARK-RAK		
> Elementtipintojen visuaalisten "poikkeamien" käsittely 2	Dec 10, 2025		RAK-tu... LUJA ARK-R...		
Lasiseinärakenteet E-lohko	Dec 9, 2025		ARK-RAK		
> Lattiamateriaalit 24	Dec 15, 2025		ARK-RAK		
Varavoimakoneen pakoputken reikiä ei tehdä 1 vaiheessa	Nov 20, 2025	MS JB	ARK-RAK LVI-Tuotanto		
Raivausautotallin muutokset	Dec 17, 2025		ARK-RAK TATE Käyttäjä		
Toimiston käytävän ovien yläosan seinätyyppi	Dec 11, 2025	MS	ARK-RAK		
Poistumisparven tiputus ja siirto	Jan 29, 2026		ARK-RAK		
Lujan porrasmittat vs ARK, pieniä eroja	Feb 2, 2026		ARK-RAK		
Tarkistetaan, millaisiin seinisiin infonäytöt tulee -> tarvitaanko tu...	Feb 2, 2026		Käyttäjä ARK-RAK		

VRK-huoltohallin terästolpat hyödykepisteille


Updates / 10 Files Activity Log +

Update via email Give feedback

Write an update and mention others with @

Julius Rajamäki 12d

Pohditaan vielä hiekoitusjärjestelmän tolppien sijaintia. Kysytään onko sijainteja mahdollista säätää (mm. ylähuoltotasojen tolpat ja roiskeseinän tolppien kohdalla).



... See less

Like Reply

Anna Äijö 5d

Onko kysymys mennyt jo Kleinille? Käyttöasteiden sijoittelu on aika herkillä, että letkut ylettyvät hiekkasäiliöille vaunujen sisällä. Käyttäjä täytyy pitää mukana, jos tulee muutoksia. Tiedoksi @Mika Nikola @Juha Jokinen

3 Reply

Write a reply and mention others with @

Julius Rajamäki Dec 2025

ARK käynyt läpi hyödykepisteitä. Hiekoitustoimittajalta on tullut / tulee jotain muutostarpeita teräsrakenteeseen.



# ICE topics via ICE form

ICE-AIHEET

Sessio	
<input type="checkbox"/>	Ruskeasuon rakennusteknisten ongelmien läpikäynti
<input type="checkbox"/>	Tilannekuvan visuaalinen ilme
<input type="checkbox"/>	Openspace käyttöönoton ajankohta ja käyttötavat
<input type="checkbox"/>	Riskien kartoitus: kesäloma-aika 2026
<input type="checkbox"/>	Projektin johdon riskien kustannusvaikutukset
<input type="checkbox"/>	Tahtituotanto ja sopimuskirjaukset
<input type="checkbox"/>	TATE:n tietomallipohjaisen työnvalmiusasteen seuranta
<input type="checkbox"/>	Parhaiden käytäntöjen kartoituksen esittely
<input type="checkbox"/>	Ruhan maalämmön haasteet
<input type="checkbox"/>	VRK hallin ylähuoltotason leveys ja vastapuolen putoamisesteen mitoitus
<input type="checkbox"/>	Jydacom: Riskit ja mahdollisuudet
<input type="checkbox"/>	Talotekniikan kiertotalous, uusiokäytettävät IV-koneet, jatko-ICE
<input type="checkbox"/>	> Poikkeamaraportit tilannekuvassa 4
<input type="checkbox"/>	Business Finland / Akseli
<input type="checkbox"/>	Kvartaalikatsoauskäytännön jalkauttaminen
<input type="checkbox"/>	Työmaa-aidat
<input type="checkbox"/>	> Varikon toiminnallisuuden varmistaminen - RATAS 1

## VRK hallin ylähuoltotason leveys ja vastapuolen putoamisesteen...

Updates / 2 | Files | Activity Log | +

Automations 3d

Like Reply

Write a reply and mention others with @

Automations 3d

Uusi ICE-sessiön aihe: February 27th 2026 14:39

ICE-session ehdottaja: Mika Nikola

Session Otsikko: VRK hallin ylähuoltotason leveys ja vastapuolen putoamisesteen mitoitus

Session tavoite: Määritellään VRK hallin ylähuoltotason leveys ja vastapuolen putoamisesteen mitoitukset.

Session vetäjä: Mika Nikola

Session osallistajat: Mika Nikola, Samu Lappalainen, Mika Saarikangas, Henrik Ranta, Antti Toivanen, Julius Rajamäki, Mika Nikola

Sessiolle toivottu päivämäärä: March 24th 2026

Sessiossa tarvitaan fasilitointiapua: Ei

Session toivottu pituus on "Kokonainen ICE-sessio 50 min" ja sessio on/ei ole sarja:

... See less

6



## Uudet ICE-aiheet

Lomakkeella voidaan esittää uusia ICE-sessioaiheita. Lomakkeella ehdotetut aiheet siirtyvät automaattisesti O2 Akseli ICE - taululle ICE-aiheet ryhmään.

### ICE-session aihe (OTSIKKO) \*

Kirjoita tähän ICE-sessiolle sopiva otsikko kokouskutsua varten

### Aiheen ehdottaja

Kirjaamalla oman nimesi helpotat ICE-sessioiden suunnittelua. Voit kuitenkin jättää kentän tyhjäksi jos haluat pysyä anonyyminä

### Session tavoite \*

Kirjoita tähän mielestäsi sessiolle sopiva tavoite. Kuvaa ratkaistava ongelma mahdollisimman selvästi

0/2000

### Session päivämäärä \*

Kirjoita ICE-sessiolle mielestäsi ajankohtainen käsittelypäivämäärä. Tästä muodostuu samalle ICE-aiheiden osalta priorisoitava järjestys ICE-päivän suunnitteluun. ICE-sessiot järjestetään tiistaisin klo 10-15:05 ja torstaisin klo 10-10:50. ICE-päivien sisäinen aikataulutus tehdään ICE-suunnitteluryhmän toimesta aina aikaisemman viikon keskiviikkona.

### Session vetäjä

Ehdota sessiolle sopivaa vetäjää. Voit halutessasi jättää kentän tyhjäksi, jos sopiva vetäjä ei ole sinulle selvää. Tällöin vetäjä määritetään ICE-suunnitteluryhmän toimesta.

0/2000

### Session osallistajat

Määritä session kriittiset osallistajat, jotka tarvitaan ehdottomasti ongelman ratkaisemiseen. Tavoitteena on pitää ICE-sessiot mahdollisimman tehokkaina ja kompakteja. Suuria yli 10 hengen kokouksia tulisi mahdollisuuksien mukaisesti välttää.



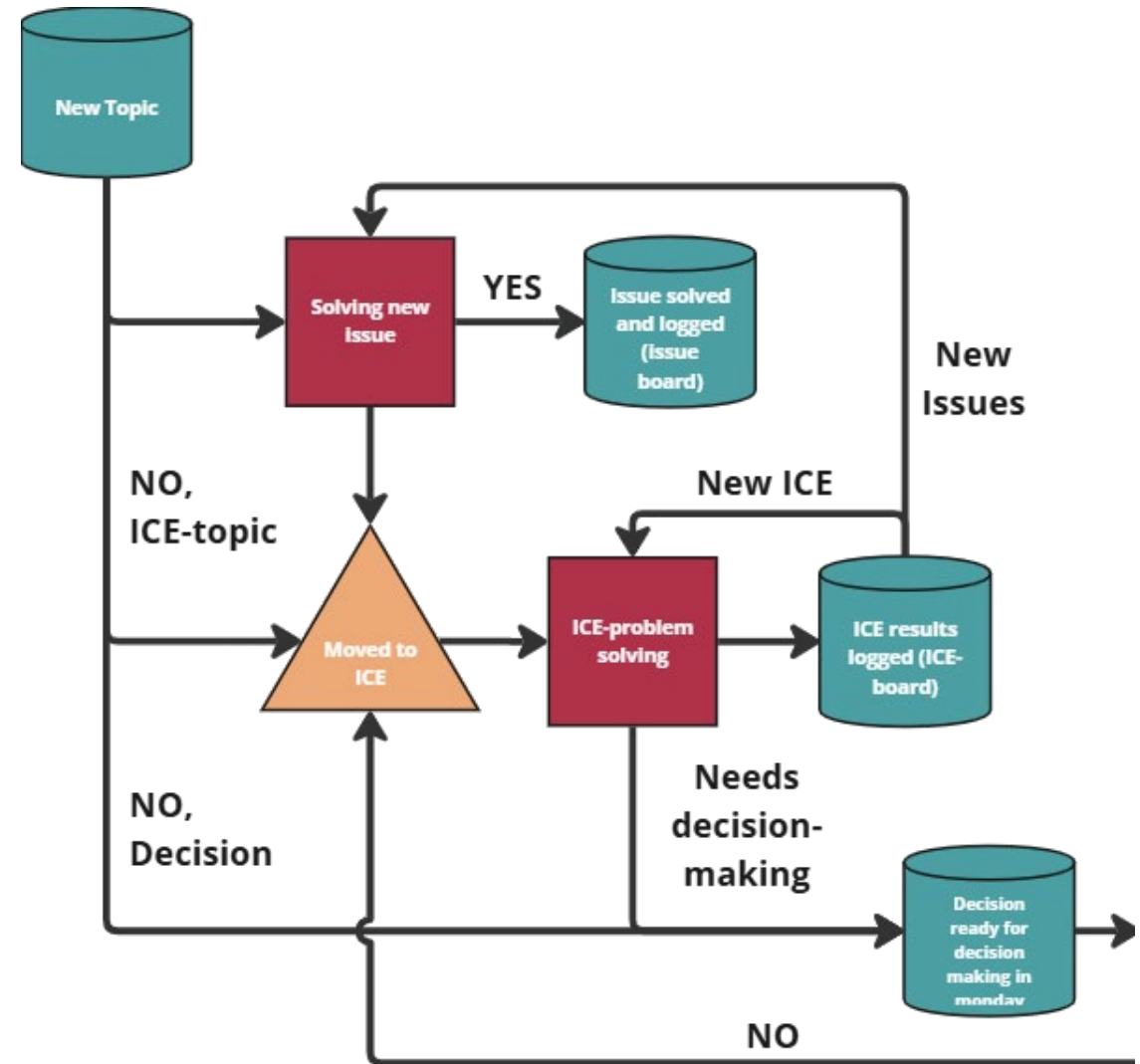
# How do we plan great ICE days?

## ICE-AIHEET

<input type="checkbox"/>	Sessio	Session vet...	Osallistujat	Huone	ICE-Päivä	Session tavoite
<input type="checkbox"/>	Dokumenttien ympäristöosuuden läpikäynt...			EI MÄÄRITELTY	Mar 16	Käydään läpi ainakin seuraavat dokumentit: -...
<input type="checkbox"/>	VRK hallin ylähuoltotason leveys ja vastapu...			EI MÄÄRITELTY	Mar 24	Määritellään VRK hallin ylähuoltotason leveys...
<input type="checkbox"/>	Tekoälyn hyödyntäminen riskien ja mahdoli...			EI MÄÄRITELTY	Mar 24	Käydä läpi, miten tekoälyä voitaisiin jatkossa ...
<input type="checkbox"/>	Ruskeasuon rakennusteknisten ongelmien l...	JZ		EI MÄÄRITELTY	Mar 24	Käydään läpi oleelliset rakennustekniset ...
<input type="checkbox"/>	Projektin johdon riskien kustannusvaikutuk...			EI MÄÄRITELTY	Mar 24	Arvioida projektin johdon riskien kustannuks...
<input type="checkbox"/>	Muutoskenaariot - Käpylän yhteysraide, va...	AL		EI MÄÄRITELTY	Mar 24	Käydään sessiossa varmistavaa keskustelua ...
<input type="checkbox"/>	Palokatkoehankinta			EI MÄÄRITELTY	Mar 24	Rakennuksen palokatkot ovat oleellisessa os...
<input type="checkbox"/>	> Simplebimin käyttö hankinnassa 4			EI MÄÄRITELTY	Mar 24	Tavoitteena päättää miten Simplebimiä hyöd...
<input type="checkbox"/>	5.2 Allianssi rakentajien indeksiseurannan p...	SH		EI MÄÄRITELTY	Mar 26	Saadaan yhteneväiset toimintatavat sovittua...
<input type="checkbox"/>	Jydacom: Riskit ja mahdollisuudet			EI MÄÄRITELTY	Mar 31	Esitellään Jydacom yleisesti. Pohditaan järjes...
<input type="checkbox"/>	Kaapelisuojausputkien rakentaminen			EI MÄÄRITELTY	Mar 31	Käydään läpi kaapelisuojausputkien rakentamis...

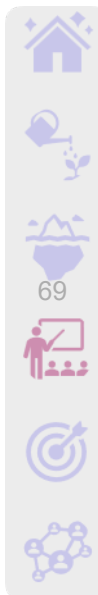
# Three levels of problem-solving?

1. Problems that can be solved by 1 person or a small team (task-management)
2. Problems that need multidisciplinary coordination (ICE)
3. Big topics that need a formal decision (decision-making)



# Key takeaways from the VDC course

1. Confirmed that our current project practices already align well with VDC-principles
2. Valuable networking
3. Strengthened understanding of PPM
4. Clearer view of how client/project objectives link with different VDC elements and metrics





# Outstanding Depot Project

CLIENT OBJECTIVES



100 year depot



Pioneer in environmental responsibility



Remain within budget and schedule



Best practices used

PROJECT OBJECTIVES

Project is delivered with outstanding quality

Reduce carbon emissions during implementation phase

10% budget saving

Safe delivery

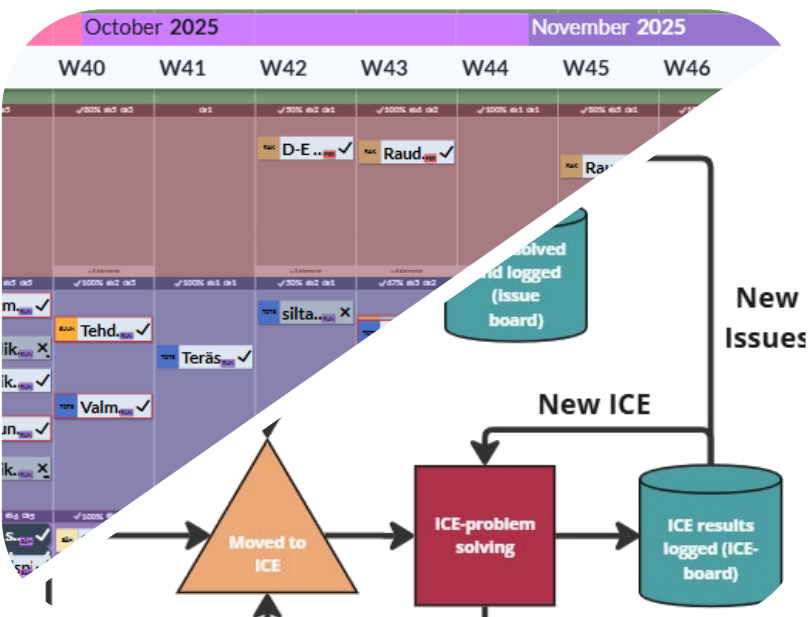
Successful collaboration with end user

BREEAM Outstanding certificate

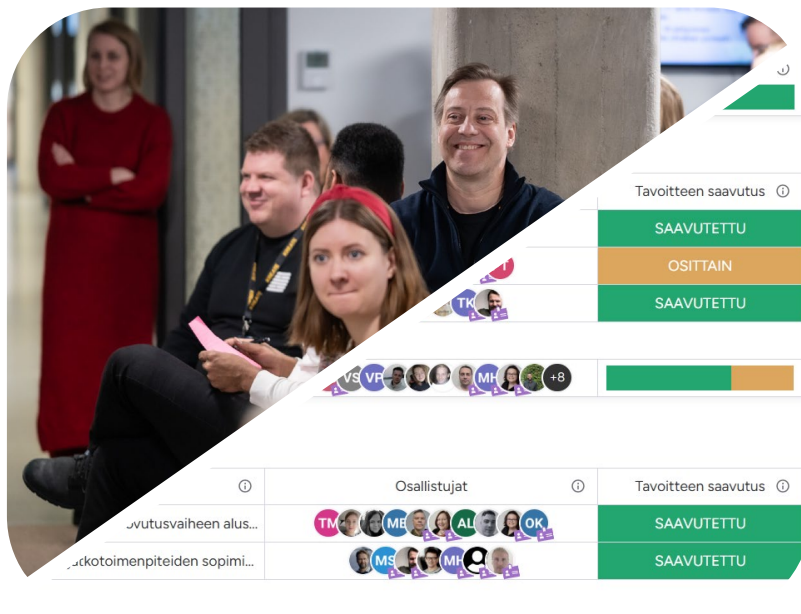
Construction time reduced by 6 months

Develop, introduce and implement innovations

## PPM



## ICE



## VIA / BIM

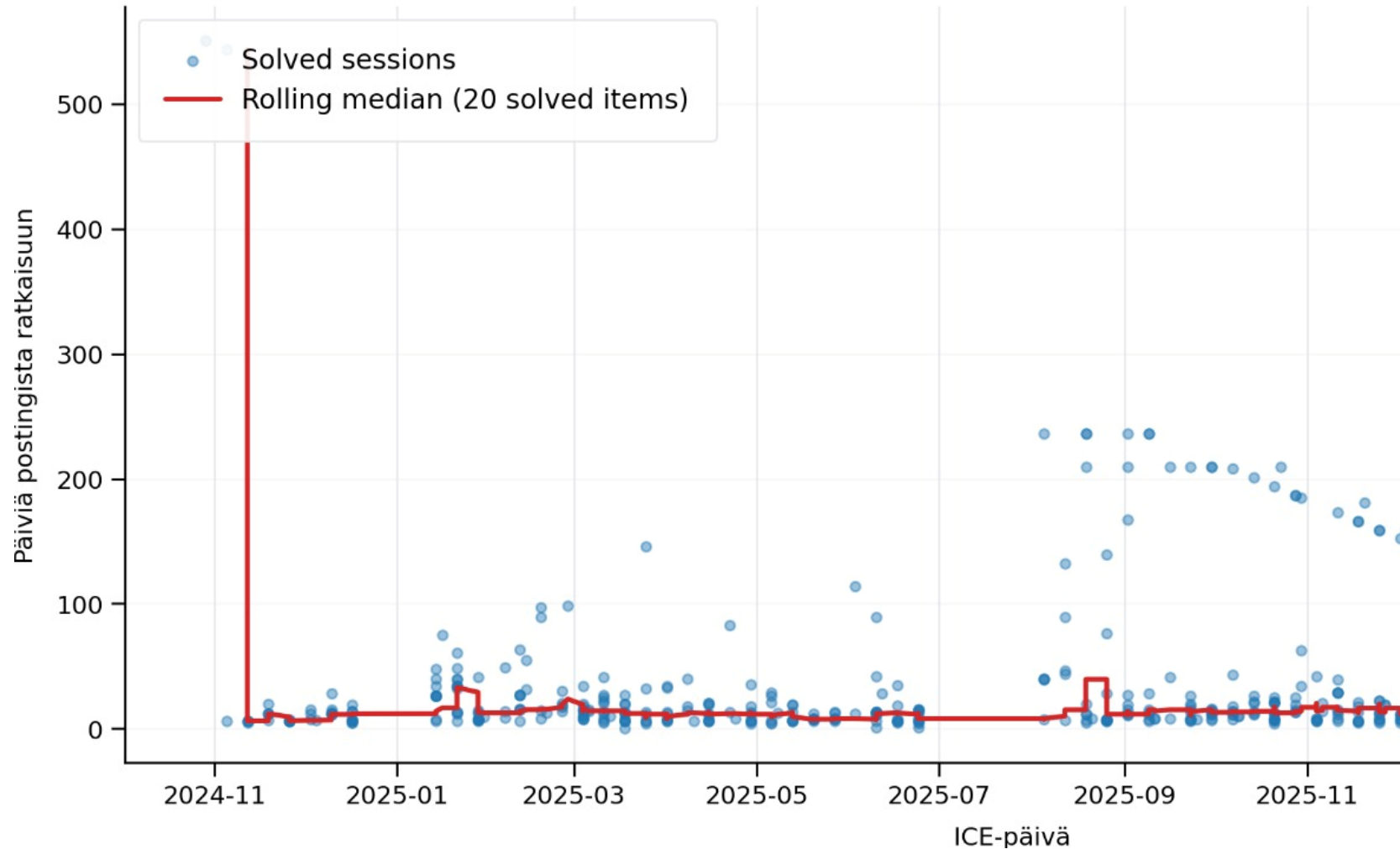


# Client Objectives are always taken into account in decision-making

Tavoitteet	Selite	Ruskon Betoni Oy	Lujabetoni Oy	Rudus Oy	Peab Industry Oy	Svenk Betoni Oy		
Alitamme tavoitekustannuksen -10%	Hankintahinta	✔️ 2	✔️ 2	✔️ 2	✔️ 2	✔️ 2	✔️ 2	edistää tavoitetta
Lyhennämme rakennusaikaa -6kk	Ei vaikutusta toimittajavalinnalla	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 1	täyttää tavoitteen
Saavutamme Breeam outstanding	EPD-kuiduista	⚠️ 1	⚠️ 1	⚠️ 0	⚠️ 1	⚠️ 0	⚠️ 0	ei vaikutusta
Vähennämme toteutusvaiheen hiilipäästöjä	Vähähiilinen betoni	✔️ 2	✔️ 2	✔️ 2	✔️ 2	❌ -1	❌ -1	alittaa tavoitteen
Toteutamme erinomaisella laadulla	Vakioitu laatu	✔️ 2	⚠️ 1	⚠️ 1	⚠️ 1	⚠️ 1		
Toteutamme turvallisesti	Skanskan toimittajapalautteet	⚠️ 1	⚠️ 1	⚠️ 1	⚠️ 1	⚠️ 0		
Otamme käyttöön alan innovaatioita	Innovaatiota on/ ei ole	⚠️ 1	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 0		
Onnistumme yhteistyössä käyttäjien kanssa	Yhteistyörajapinta käyttäjän kanssa on/ei	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 0	⚠️ 0		
		9	7	6	7	2		

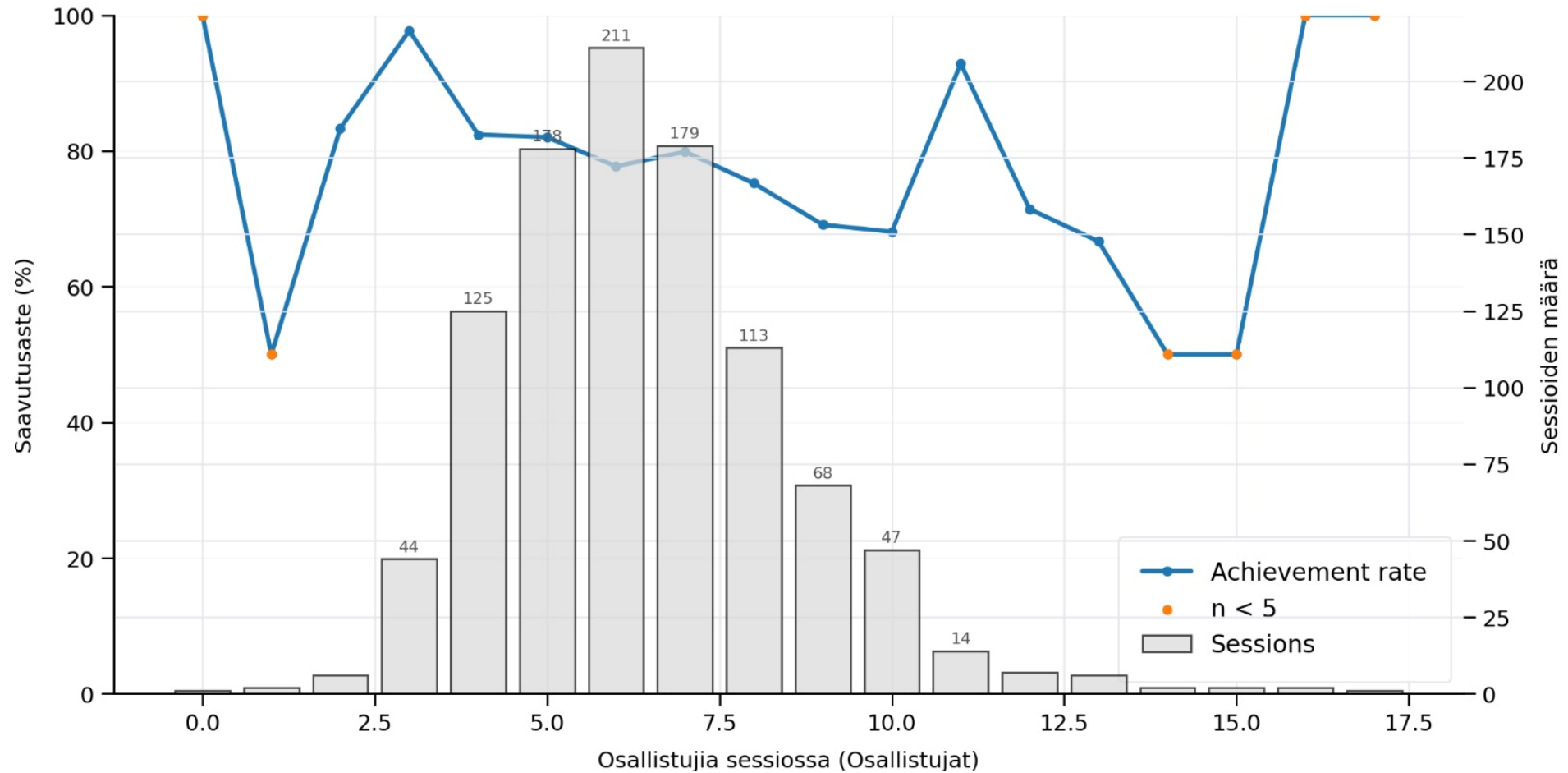
71

# Issues are solved reliably in about 14 days



# % of issues drops slightly as the number of participants in an ICE session increases

Osallistujamäärä vs tavoitteen saavutusaste



# What are the trends across 1,000+ ICE sessions?

## Planning/design coordination decreases over time

- Early in the timeline, a lot of sessions focus on basic design coordination and technical alignment such as structures, foundations, drainage, interfaces, and general design-phase problem solving. Later on, these topics appear less frequently, which suggests the project has moved past the most intensive early coordination phase.

## Execution / production support increases as the timeline progresses

- The sessions shift more toward implementation-oriented topics such as production support, site logistics, schedule coordination, practical execution decisions, and worksite operations. That looks like a clear increase

## Carbon, BREEAM, and environmental themes increase

- Topics related to BREEAM and environmental monitoring become much more common later in the project. These seem to move from occasional topics into a more recurring and structured theme.

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## Digitalization / information management increases

- There is also a noticeable increase in sessions around metrics and data/information management. Digital steering and data-driven project control become more visible over time.

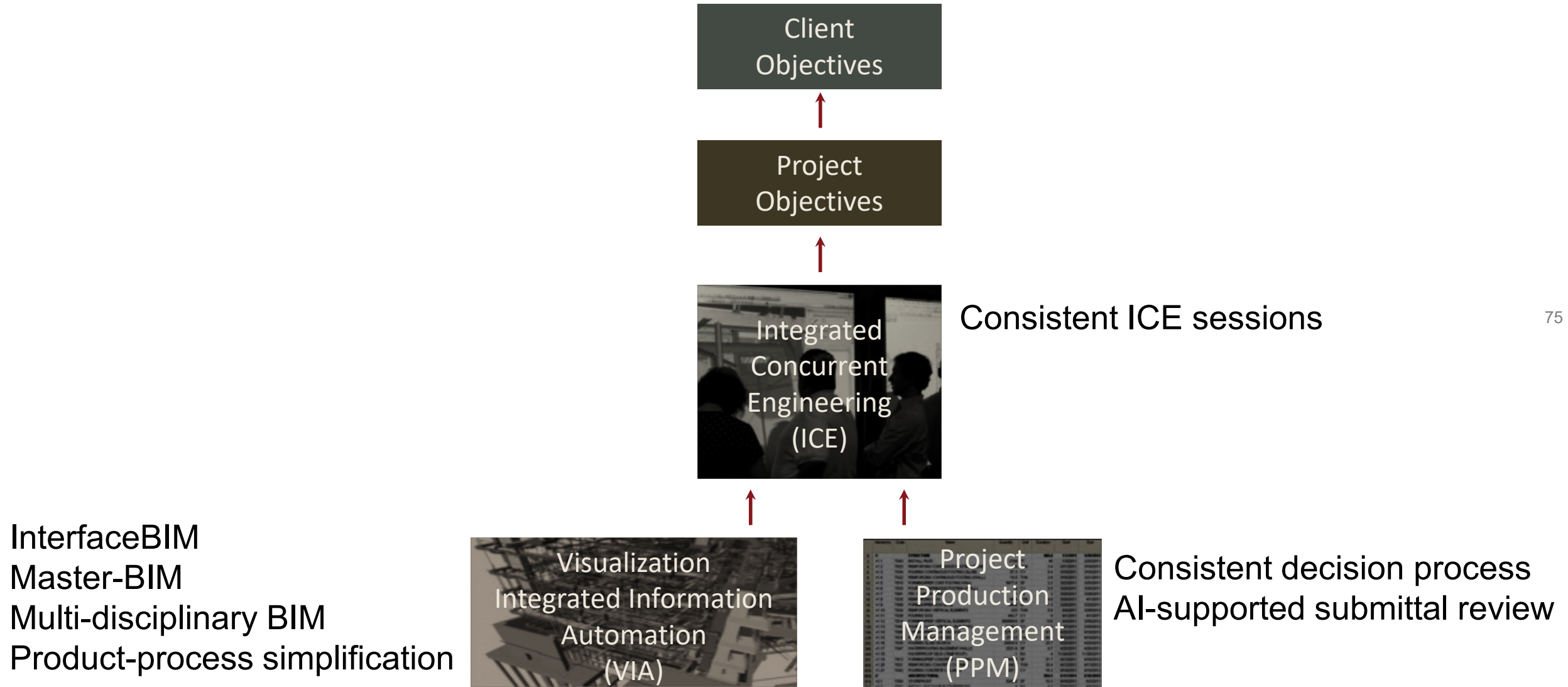
## Quality, safety, and operational control topics increase

- Later sessions include more on quality management, safety observations, risk handling, implementation controls, and operational routines. That suggests the project is moving from “how should we design this?” toward “how do we control and deliver this well in practice

## Commissioning / handover readiness begins to rise

- There is now more emphasis on use-phase preparation, maintenance, handover-related planning, and operational functionality. That indicates gradual movement toward later delivery-stage readiness.

# The VDC Playbook for Relentless Performance

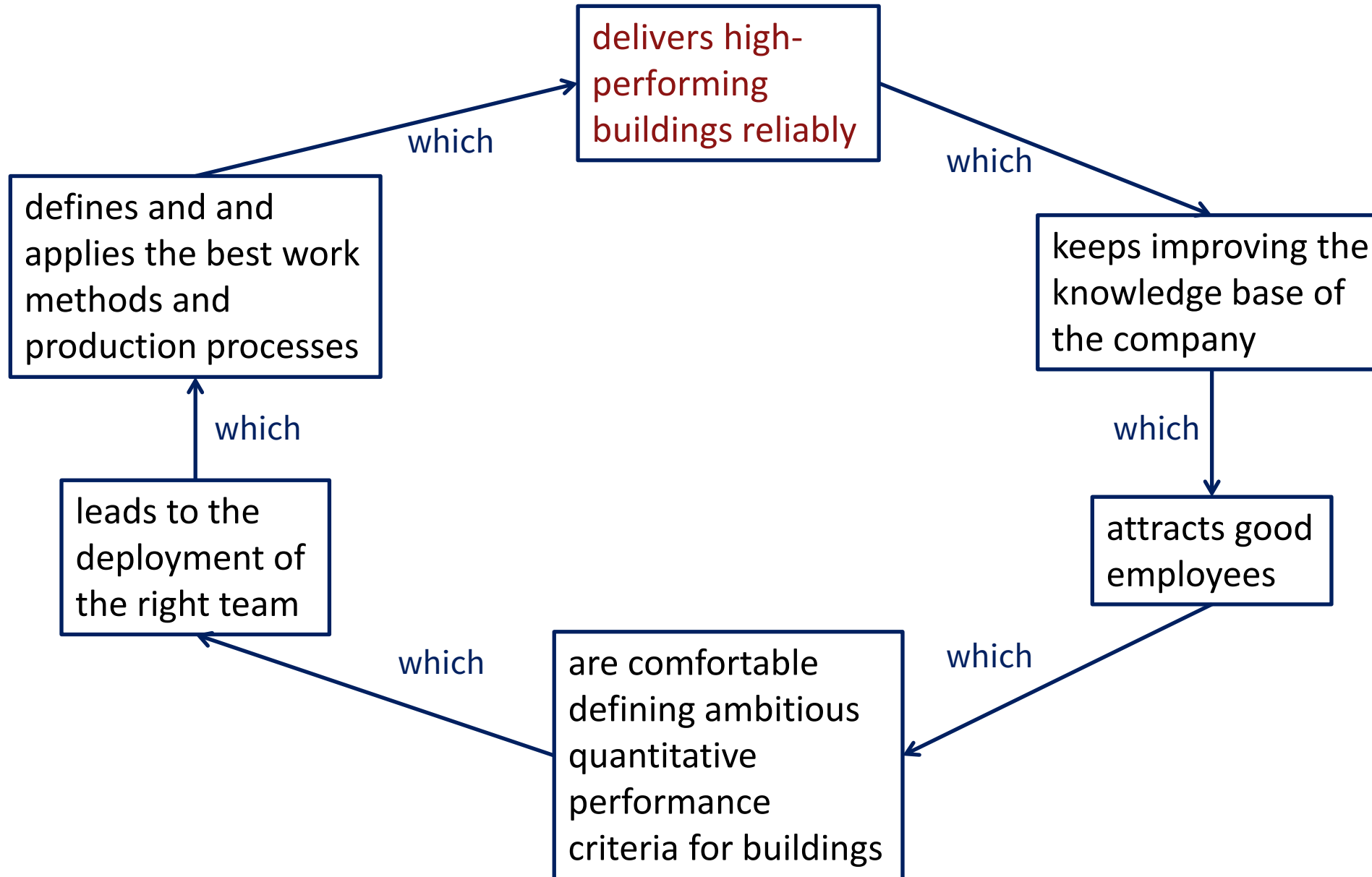


# Everyone wants to deliver great projects with a great team

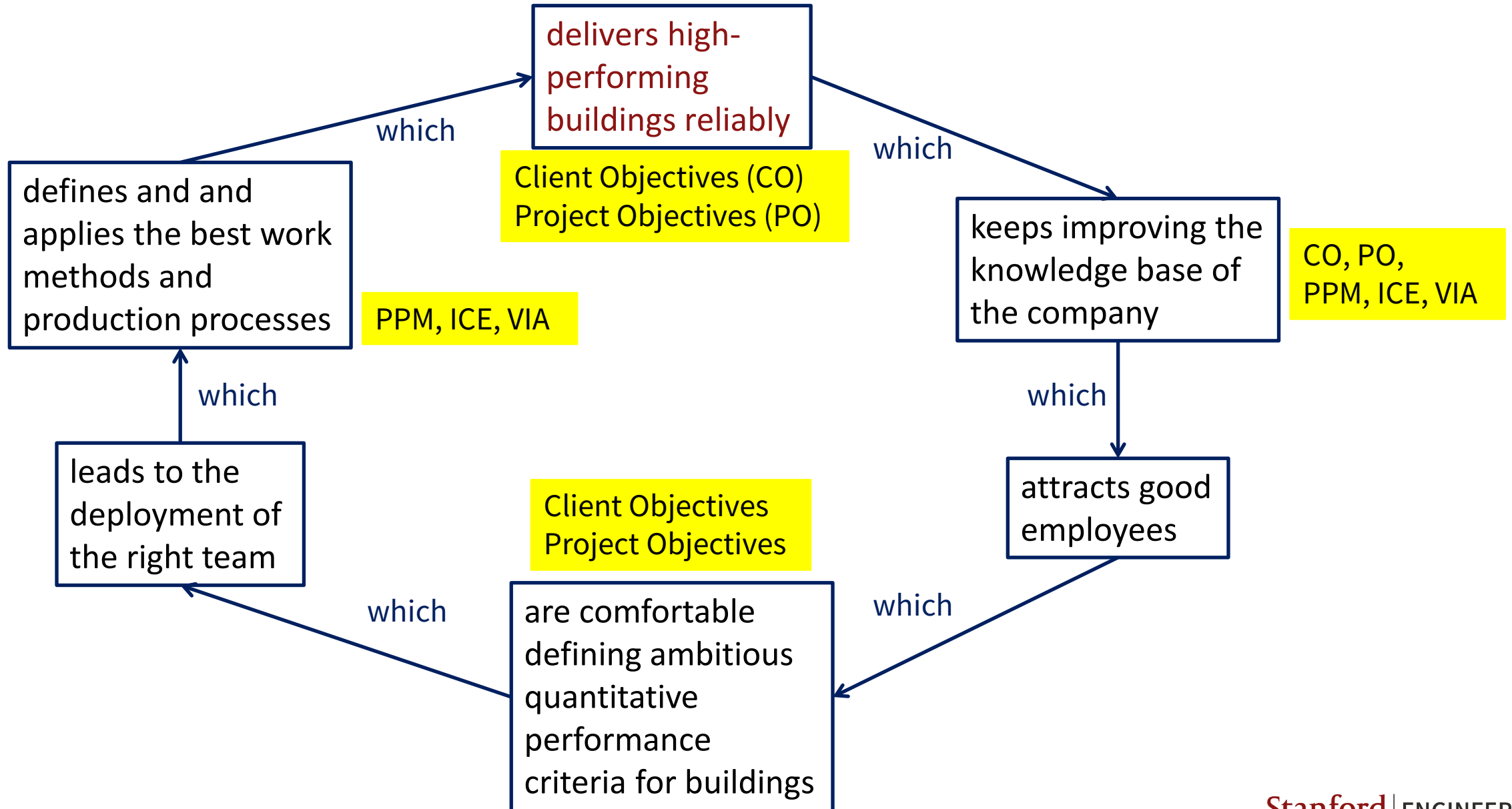
delivers high-  
performing  
buildings reliably

attracts good  
employees

# Flywheel to create high-performing buildings with VDC



# Flywheel to create high-performing buildings with VDC



# Stop Managing Projects. Start Building Flywheels: The VDC Playbook for Relentless Performance

**Martin Fischer, [fischer@stanford.edu](mailto:fischer@stanford.edu)**

- Stanford University
  - Kumagai Professor in the School of Engineering
  - Professor, Civil & Environmental Engineering
  - Coordinator, Sustainable Design and Construction Program
  - Director, Center for Integrated Facility Engineering (CIFE)
  - Senior Fellow, Precourt Institute for Energy (PIE)
- Member, Swedish Academy of Engineering Sciences (ICA)

