

An aerial photograph of an airport, showing runways, taxiways, and terminal buildings. A network of blue dots connected by thin white lines is overlaid on the image, primarily concentrated on the left and right sides, suggesting a digital or data network.

# OICE Forum Internazionale 2017

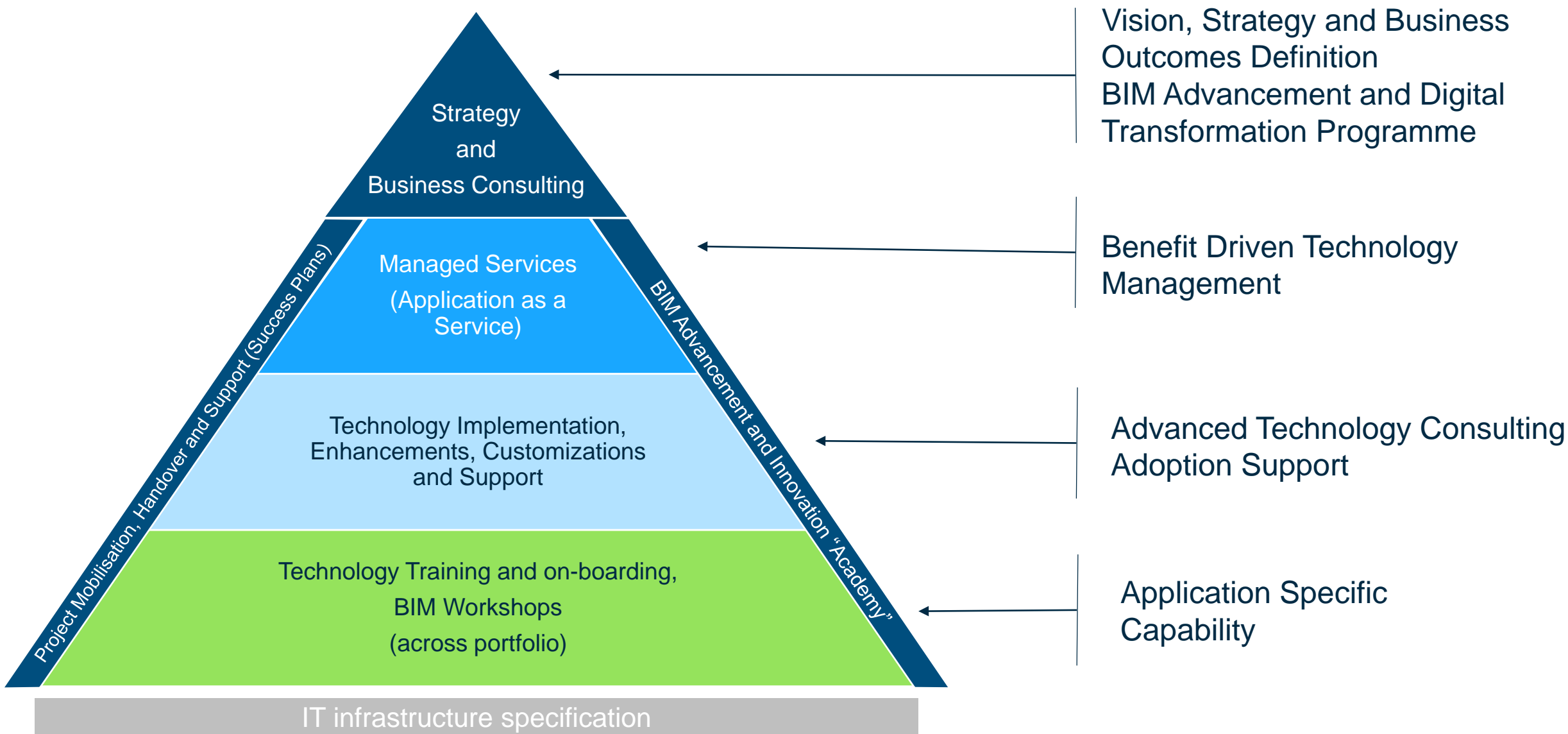
## Digital Transformation and the Connected Data Environment

**Jakub Wachocki**

Digital Strategies Advisor - Bentley Systems



# Digital Transformation





# CHALLENGE. ENGAGE. CO-CREATE. TRANSFORM.

discover, develop and adopt smarter ways to build the built environment

Peer-Innovate Now

[www.thePIF.org](http://www.thePIF.org)

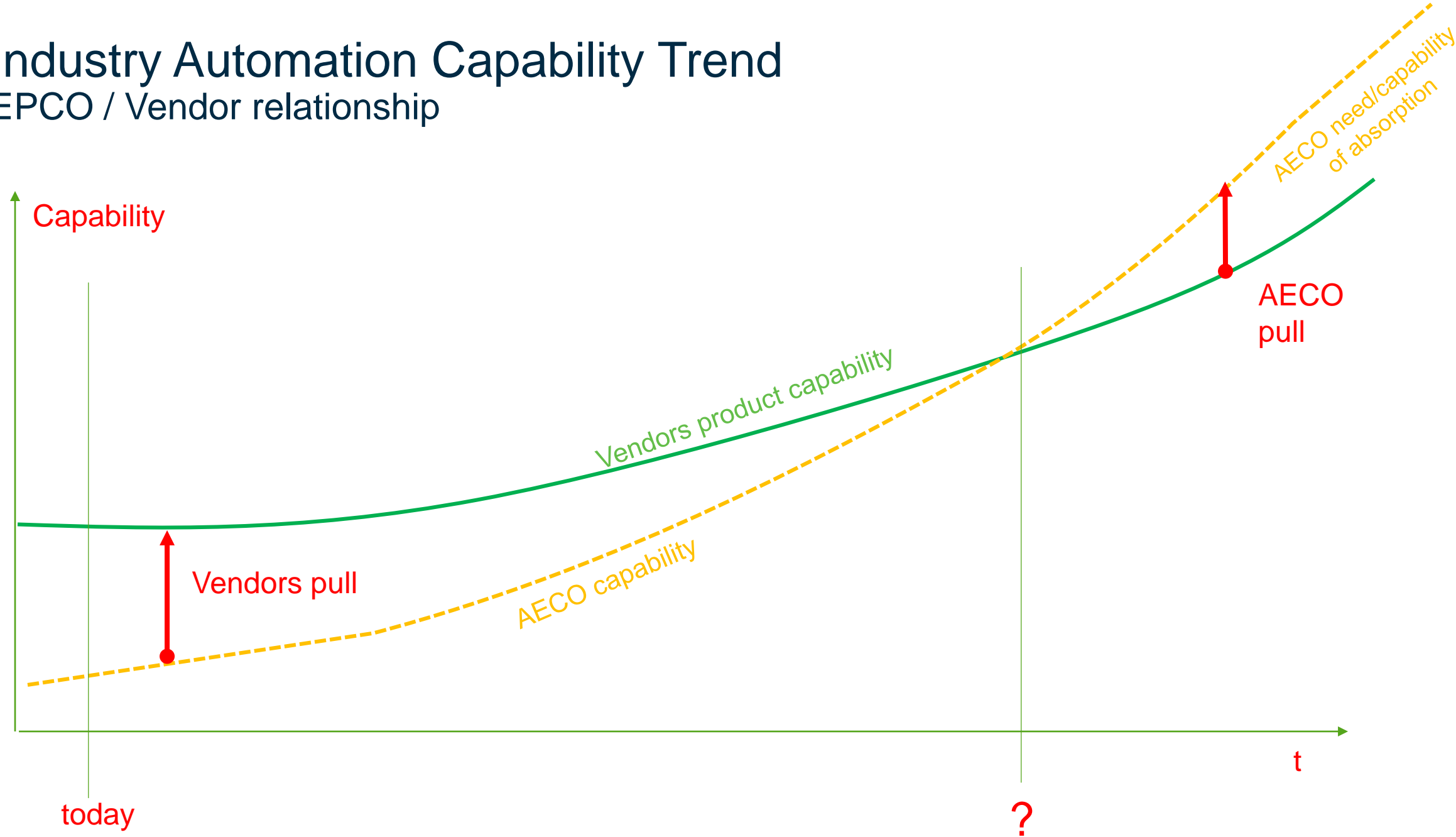


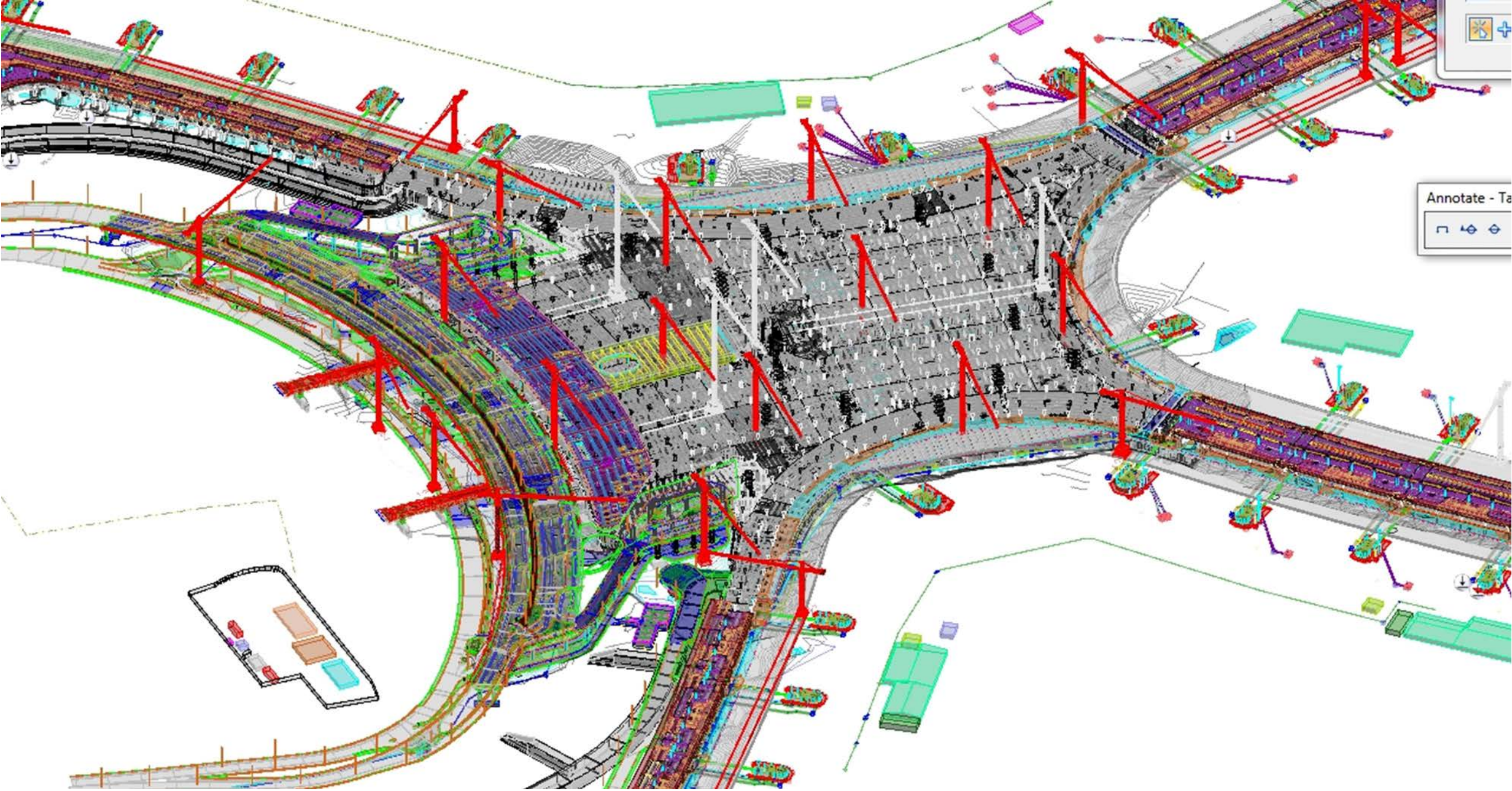
@thePIForg



# Industry Automation Capability Trend

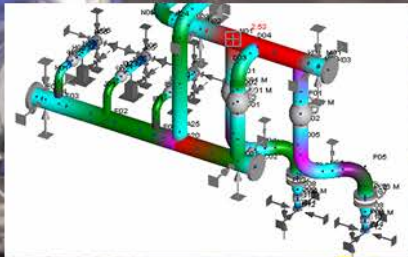
## EPCO / Vendor relationship



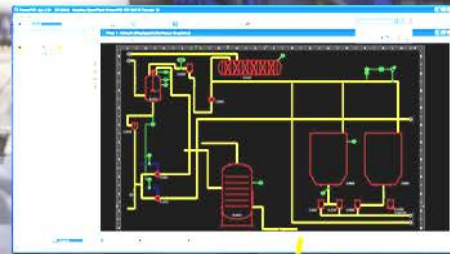




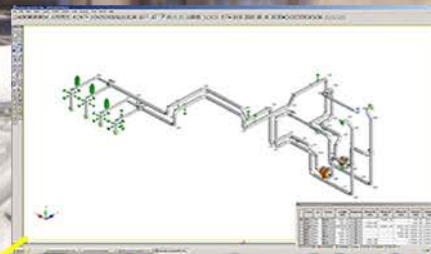
# The Owners' vision: *Operational excellence through on-time/on-budget Capital Projects*



Analytical Model

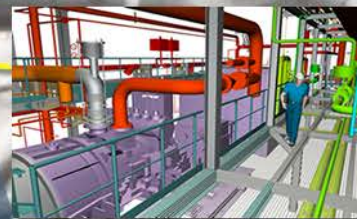


Schematics



Engineering Model

Inspection Form



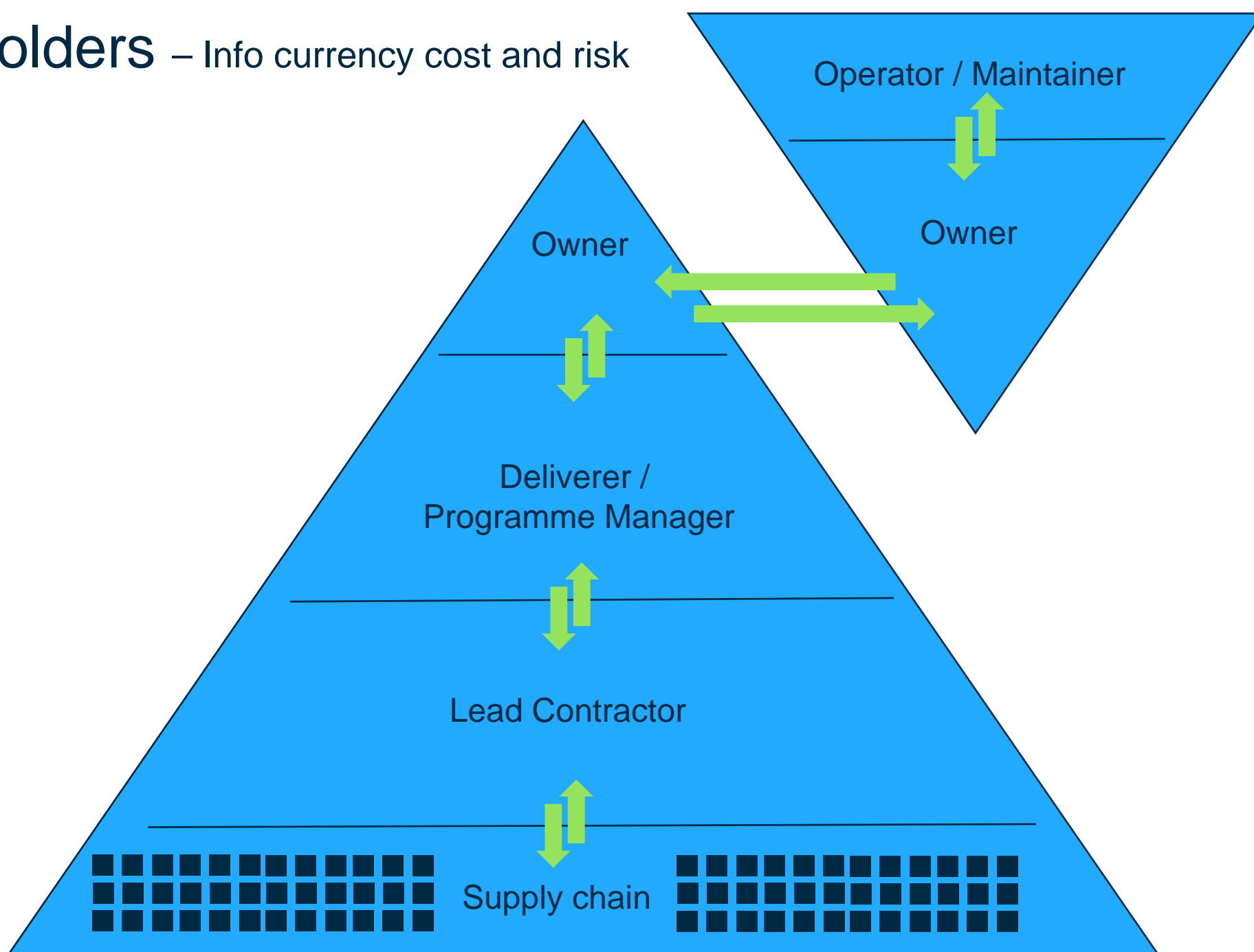
Training Video



Failure Modes and  
Effects Analysis

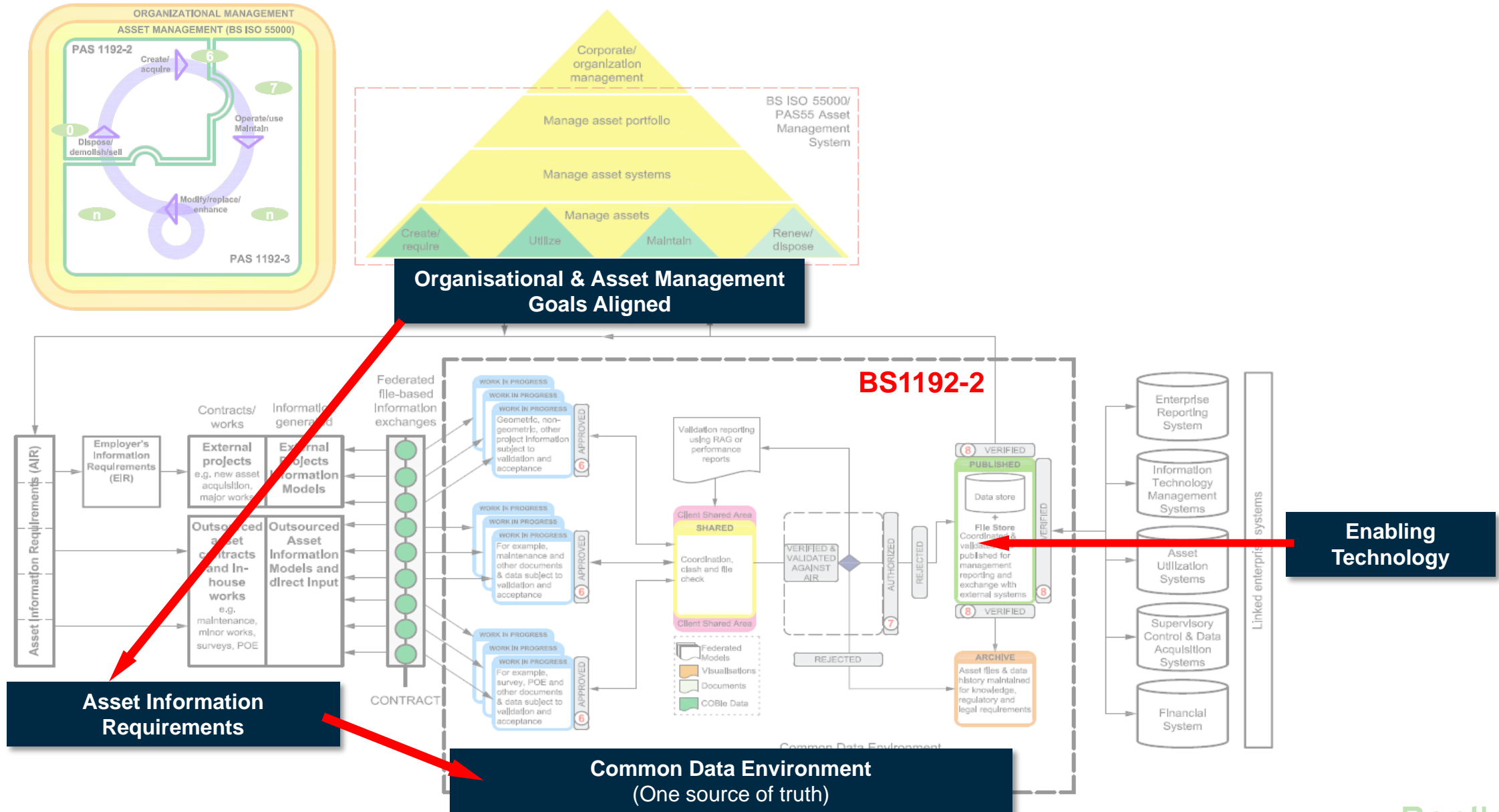
Chiller  
Piping

# Stakeholders – Info currency cost and risk

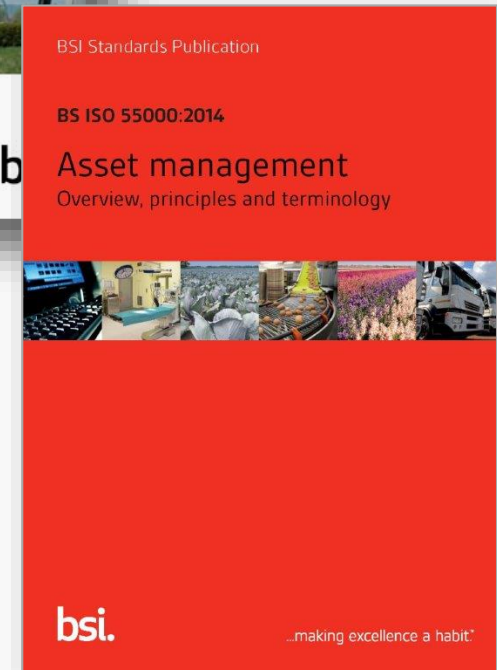
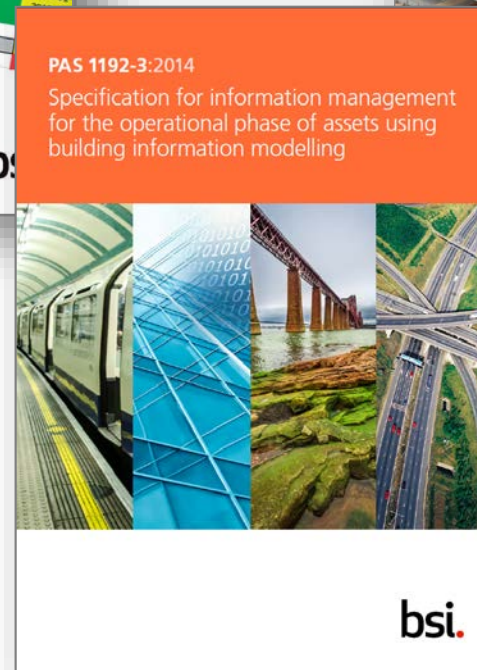
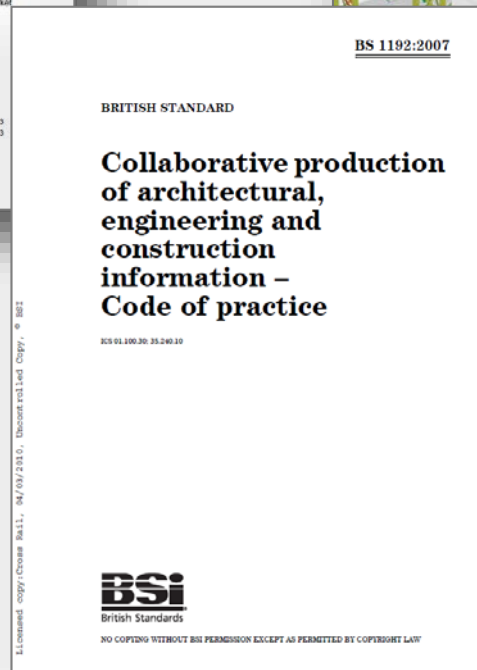
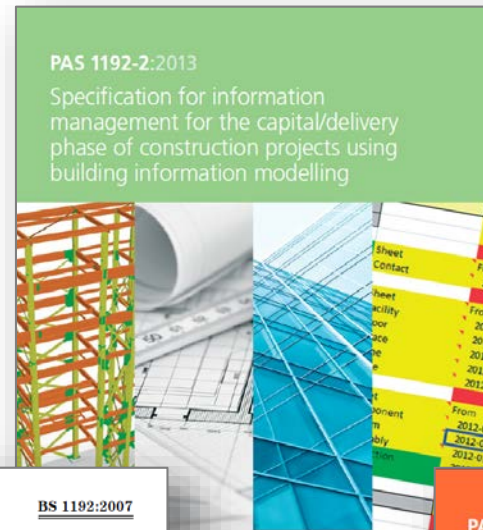
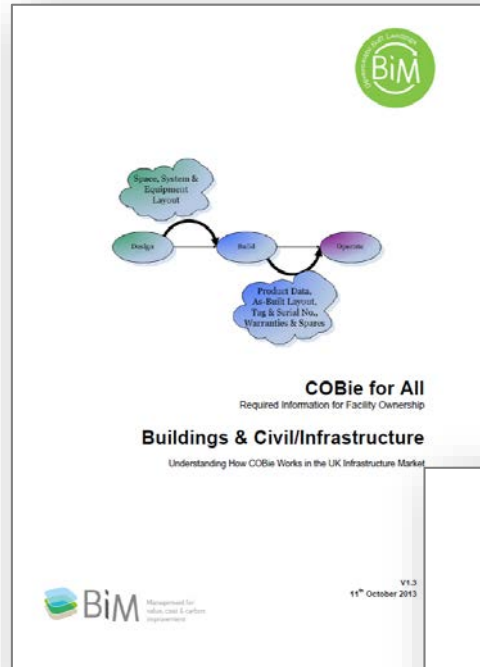




# Define the Digital Asset Strategy

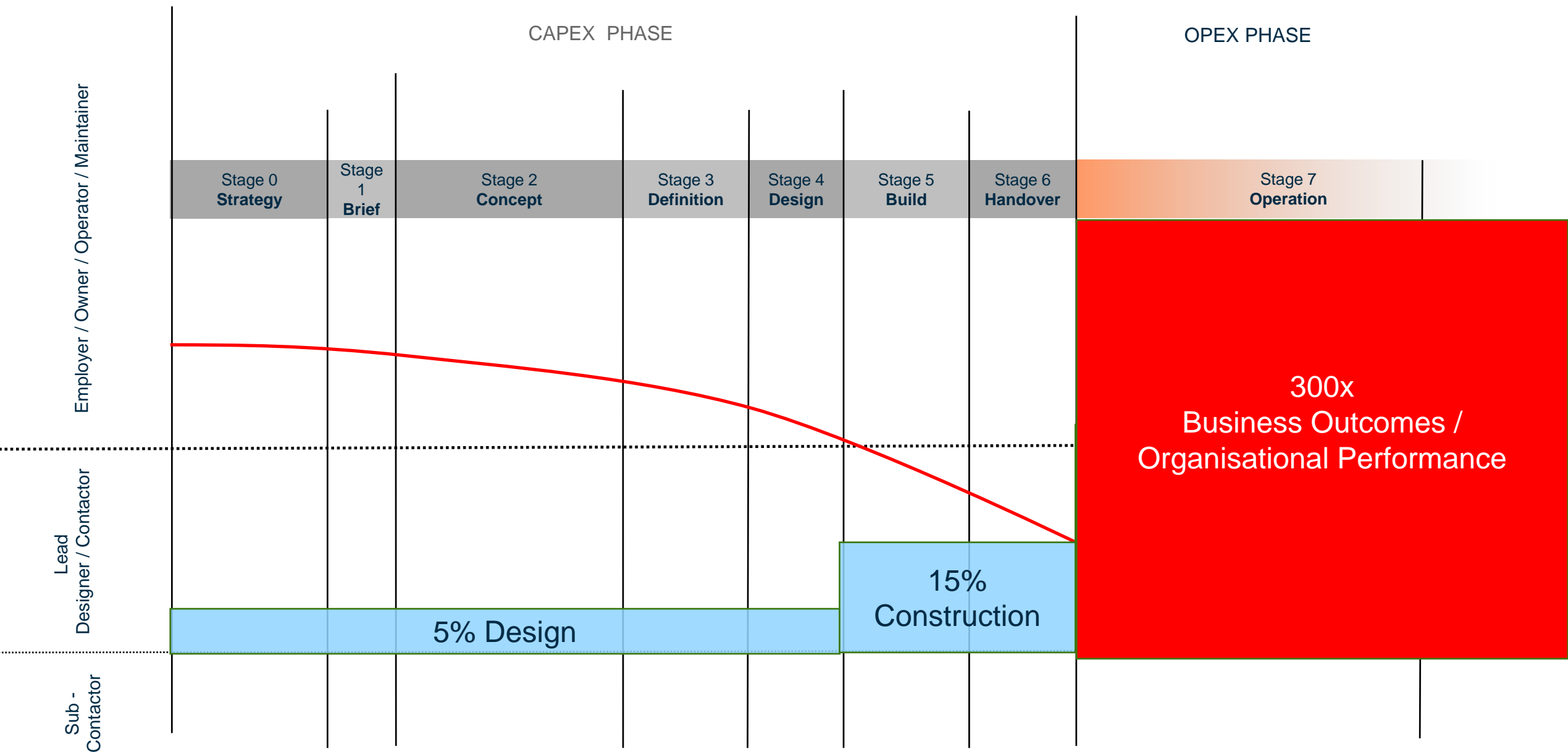


# Apply Standards & Best Practices

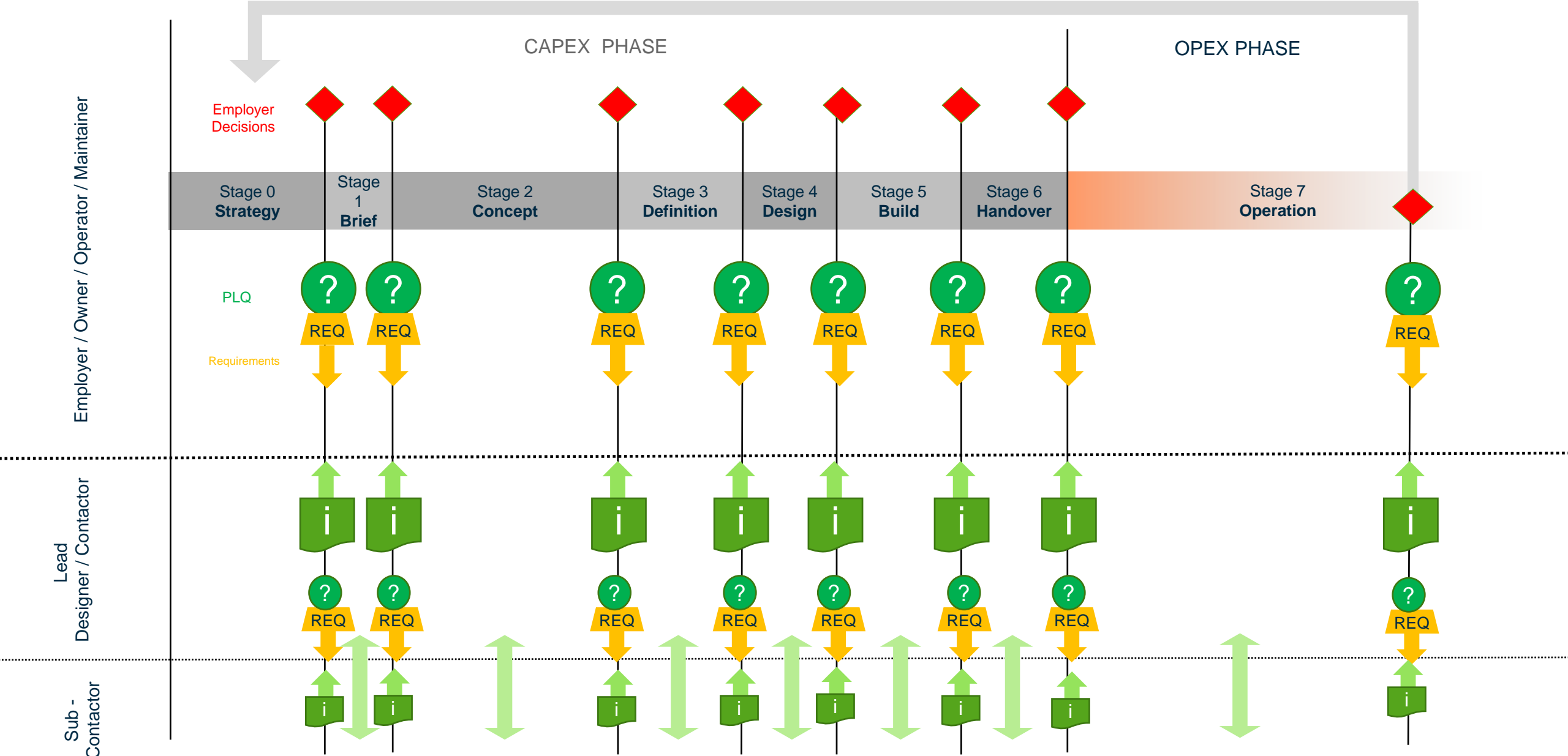


ISO 19650

# ASSET LIFECYCLE VALUE

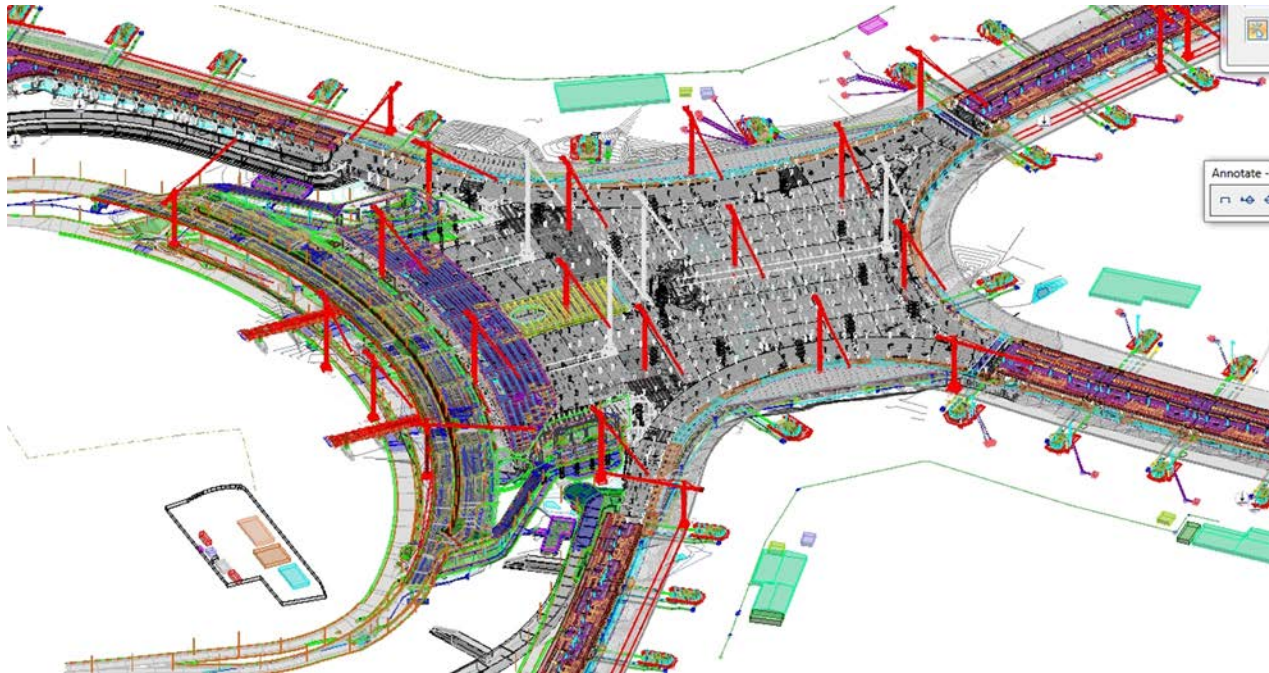


# Contract Stages, Gates, Requirements and Compliance

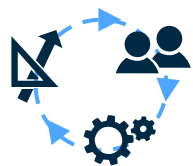




# So is it BIM?



# So is it BIM? ... or is it a digitally empowered:



## Project Governance

Project Strategy  
Collaboration  
Contracts  
Org. Structures  
H&S  
Design Review and Approval  
Process  
Innovation Schemes



## Project Coordination

Interface  
Resources  
Stakeholders  
Comms



## Contract Management Integrated Project Controls

Scope  
Change  
Configuration Mgt  
Claims and Delays



## OPEX Performance

Asset strategy  
Operations  
Performance  
Reliability

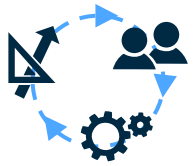


ProjectWise

AssetWise



# HS2 JV COMMON DATA ENVIRONMENT



## Comprehensive BIM Worksharing



BIM Management  
Design Integration  
Asset Registration  
PAS 1192 Workflows  
COBie – Import / Export  
EIR Requirements



GIS Integration  
with engineering, 2D/3D  
geospatial & operational  
data. ESRI connection



Collaboration  
Engineering & Design



Dashboards &  
Reporting



## BIM Review

BIM co-ordination reviews  
Create Visual reports  
Navigate models immersively  
Issue resolution  
Query model information  
Clash resolution  
Schedule Simulation (Q3 2016)  
Use on any device (Windows,  
Apple & Android)



## ALIM



Asset Registry &  
Tag Management



Contract  
Administration



Technical  
Queries



Document Control &  
Management



Dashboards &  
Reporting



## Enterprise Interoperability



ProjectWise to AssetWise



Connectivity to HS2  
CDE (when verified by  
HS2)

*Other connections to JV or partner  
systems is outside the scope of this  
offering but can be arranged through  
the Account Manager.*



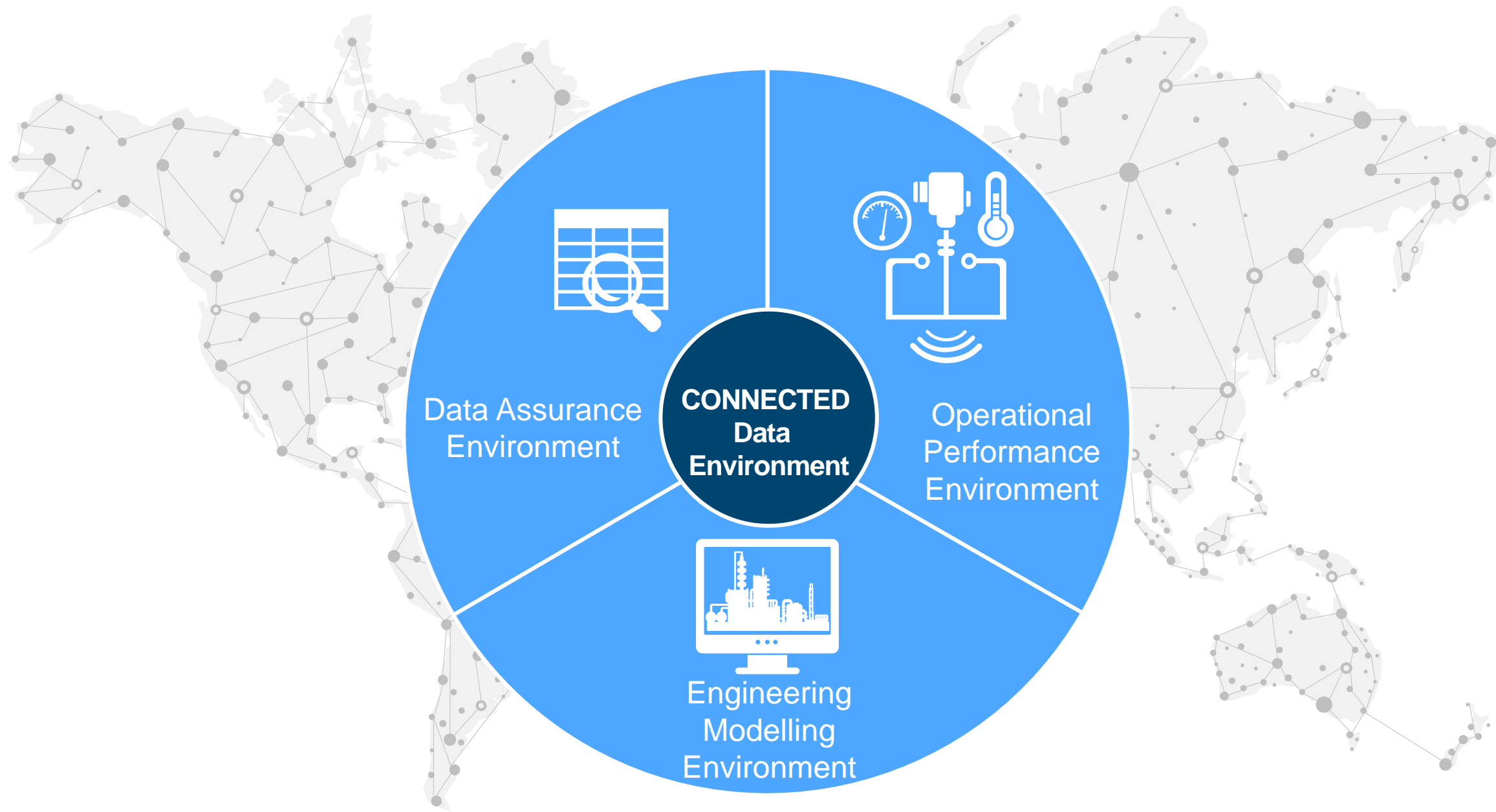
ProjectWise



AssetWise



Bentley Managed Service



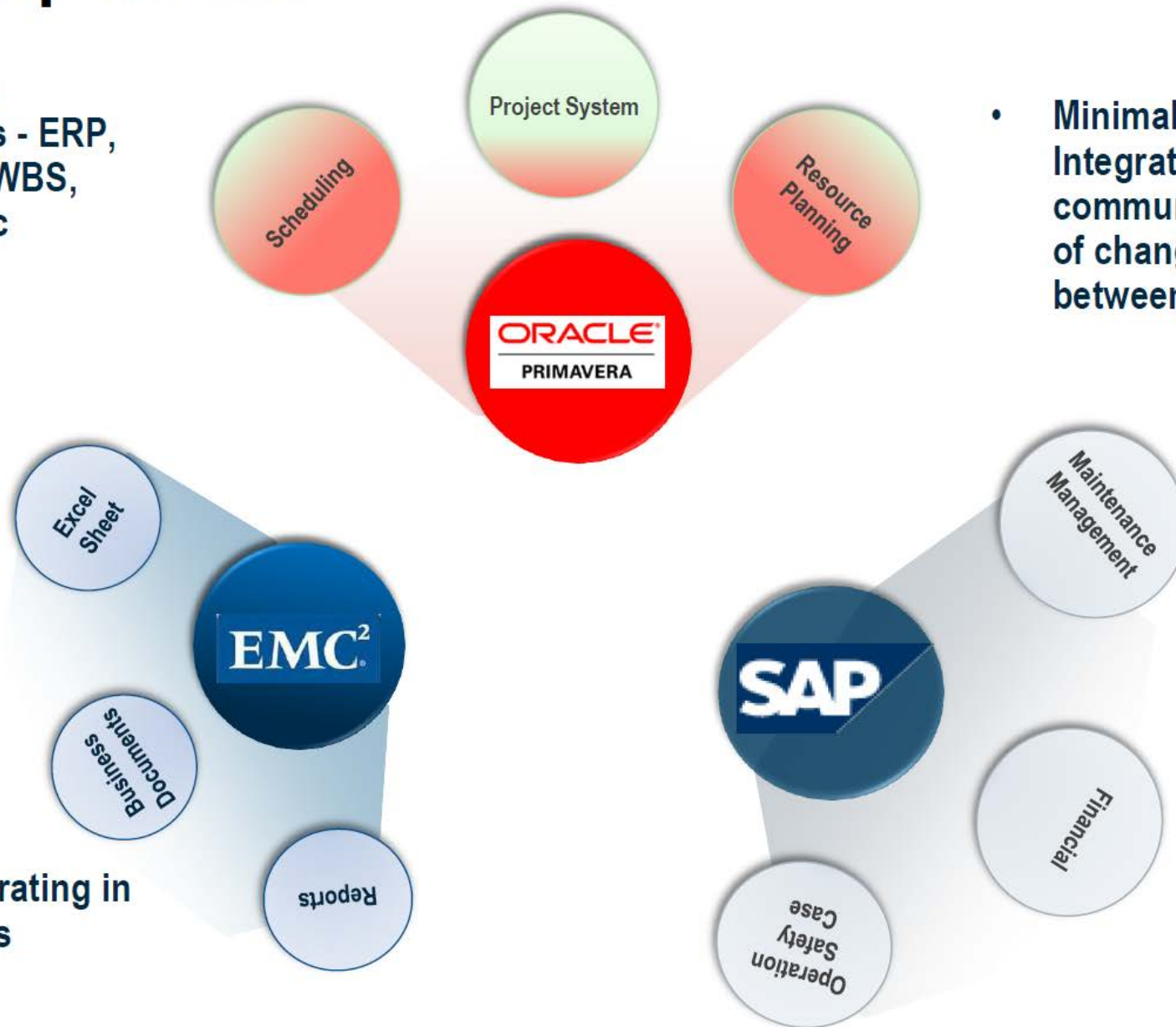


# Silo Operation

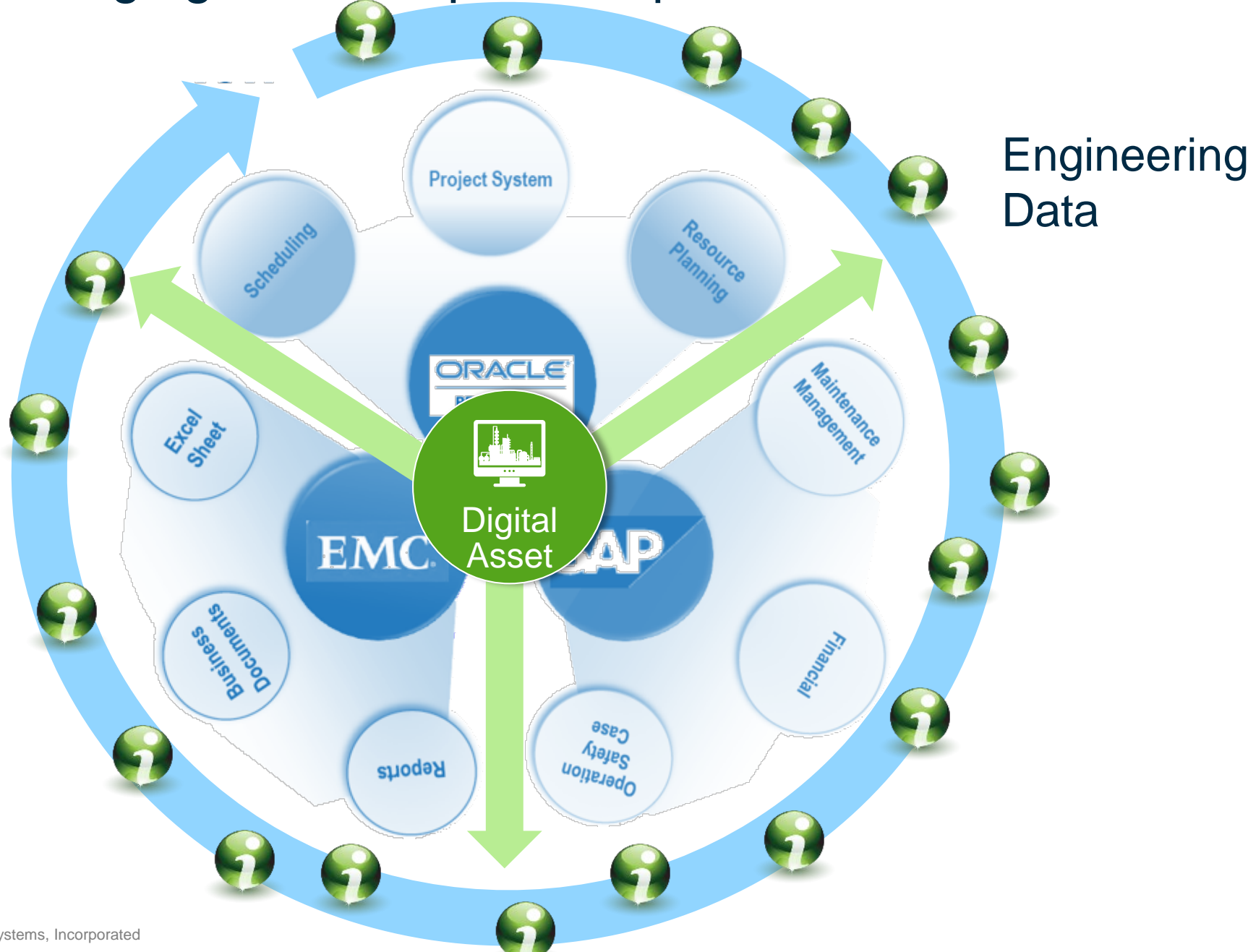
- Multiple Systems - ERP, EMMS, WBS, CAD, etc

- Minimal Integration - No communication of change between apps

- Operating in Silos

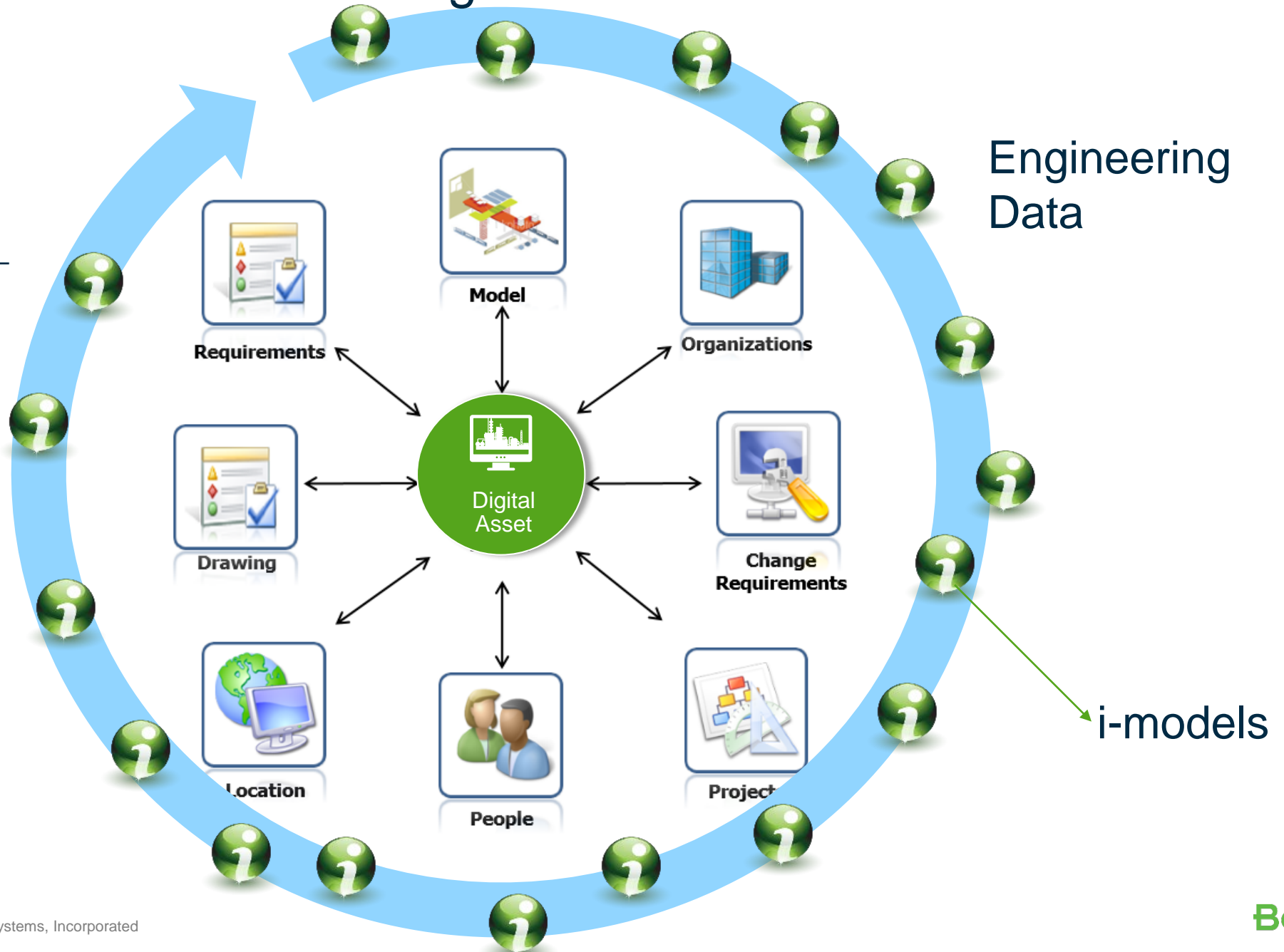


# Digital Asset – Bridging the Enterprise Gap



# Asset Lifecycle Information Management

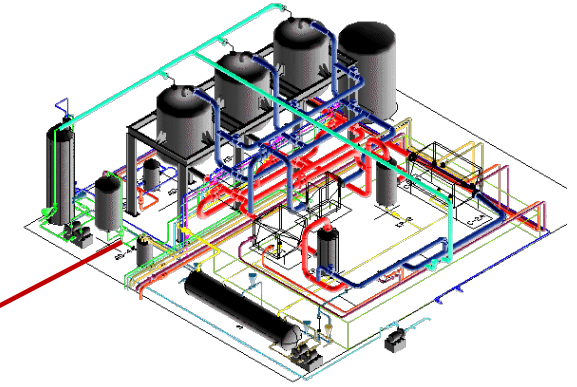
- Manages much more than just documents...
- Relates structured and unstructured information
- Focuses on relationships – information in context
- Records conditions, incidents and actions
- Captures, tracks and facilitates change
- Creates auditable sequences



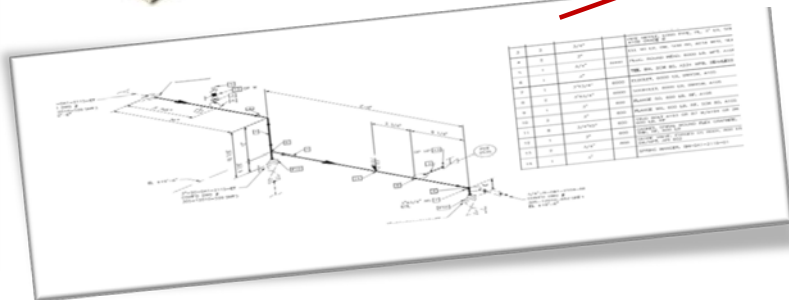


# DIGITAL ID

## Linking the physical and virtual



**M25-TMPS-00265**  
**Temporary Works**  
**Scaffolding**



Tag Code	Name	Description	Operational Status	Height (Metre)	Length (Metre)	Length (Metre) Number
M25-TMPS-00237	Tmp works scaffold	wsp00237	Planned			
M25-TMPS-00238	Tmp works scaffold	wsp00238	Planned			
M25-TMPS-00239	Tmp works scaffold	wsp00239	Planned			
M25-TMPS-00233	Tmp works scaffold	wsp00233	Abandoned in Place			
M25-TMPS-00230	Tmp works scaffold	wsp00230	Installed			
			Uninstalled			

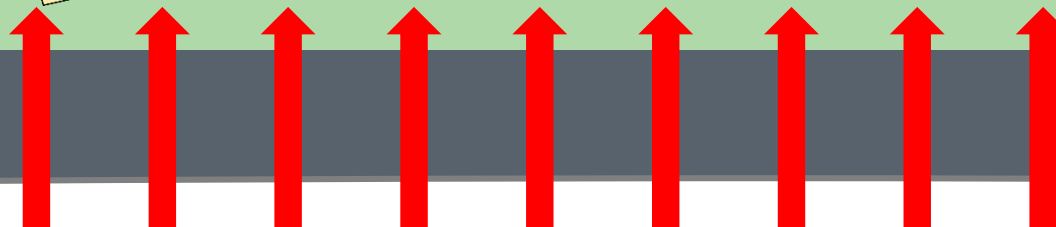




## Connected Data Environment



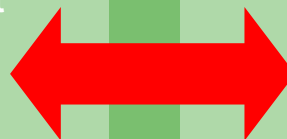
Deliverables



## Engineering Productivity

Common Analysis Environment

Common Modelling Environment





# Connected Data Environment



Context Share



Components Center



Optioneering



Project Performance Dashboards



Project Share



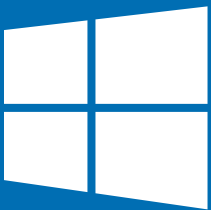
Deliverables Management



Issues Resolution



Automation



Microsoft Azure

Engineering Productivity



Analyze



Design



Review



Road



Rail



Bridge



Site



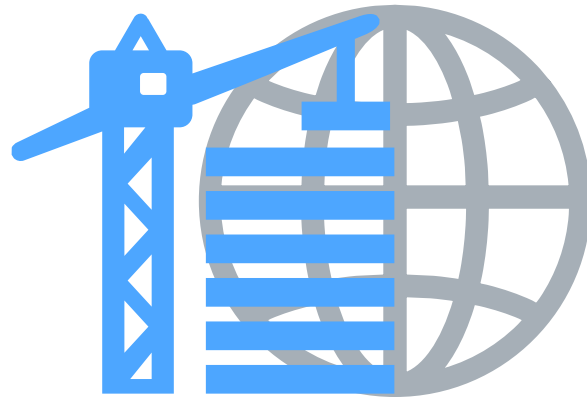
Building



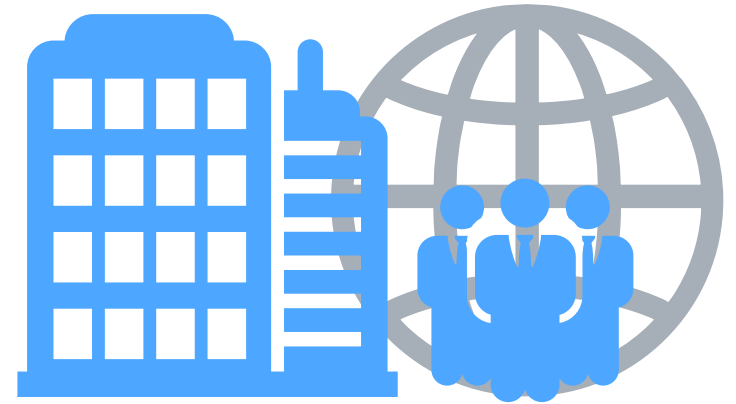
# Instant Knowledge about Users, Projects and Enterprise



CONNECTED Users



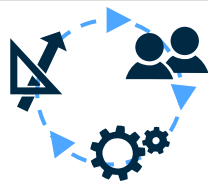
CONNECTED Projects



CONNECTED Enterprise

# ProjectWise CONNECT Edition

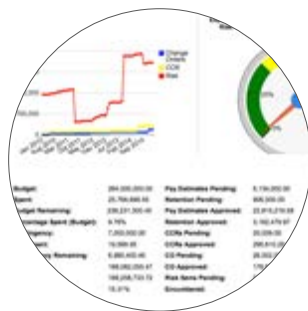
## PROJECT INSIGHTS



Comprehensive  
BIM Worksharing



Contract and  
Construction Mgmt.



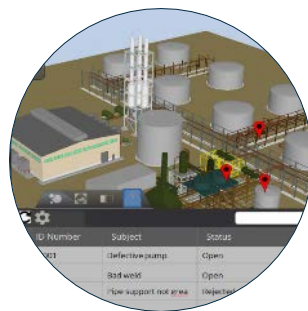
Work Packaging



Completions



BIM Review



COMMON DATA ENVIRONMENT

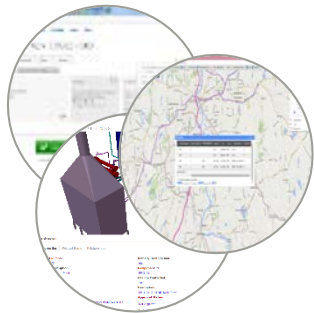
# AssetWise CONNECT Edition



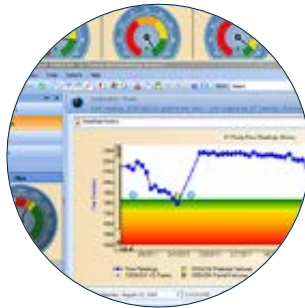
## CONNECTED ASSET PERFORMANCE



ALIM



Asset Reliability



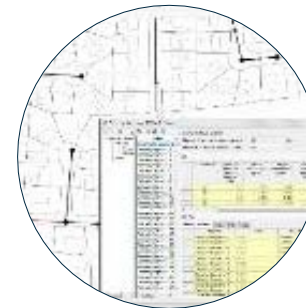
Work Management



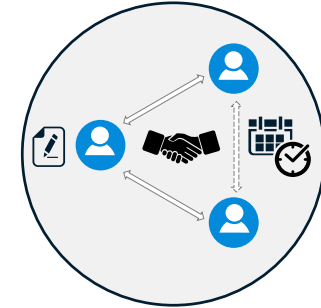
Operational Analytics



Asset Optioneering



Enterprise Interoperability



COMMON DATA ENVIRONMENT



CFA 14  
Newton Purcell to Brackley

HS2 CFA 14 TO 4 - this video is a snapshot in time and reflects the  
land take as shown in the deposited hybrid bill (November 2013)

# HS2 CDE Compliant Delivery

Landscape Mitigation Planting

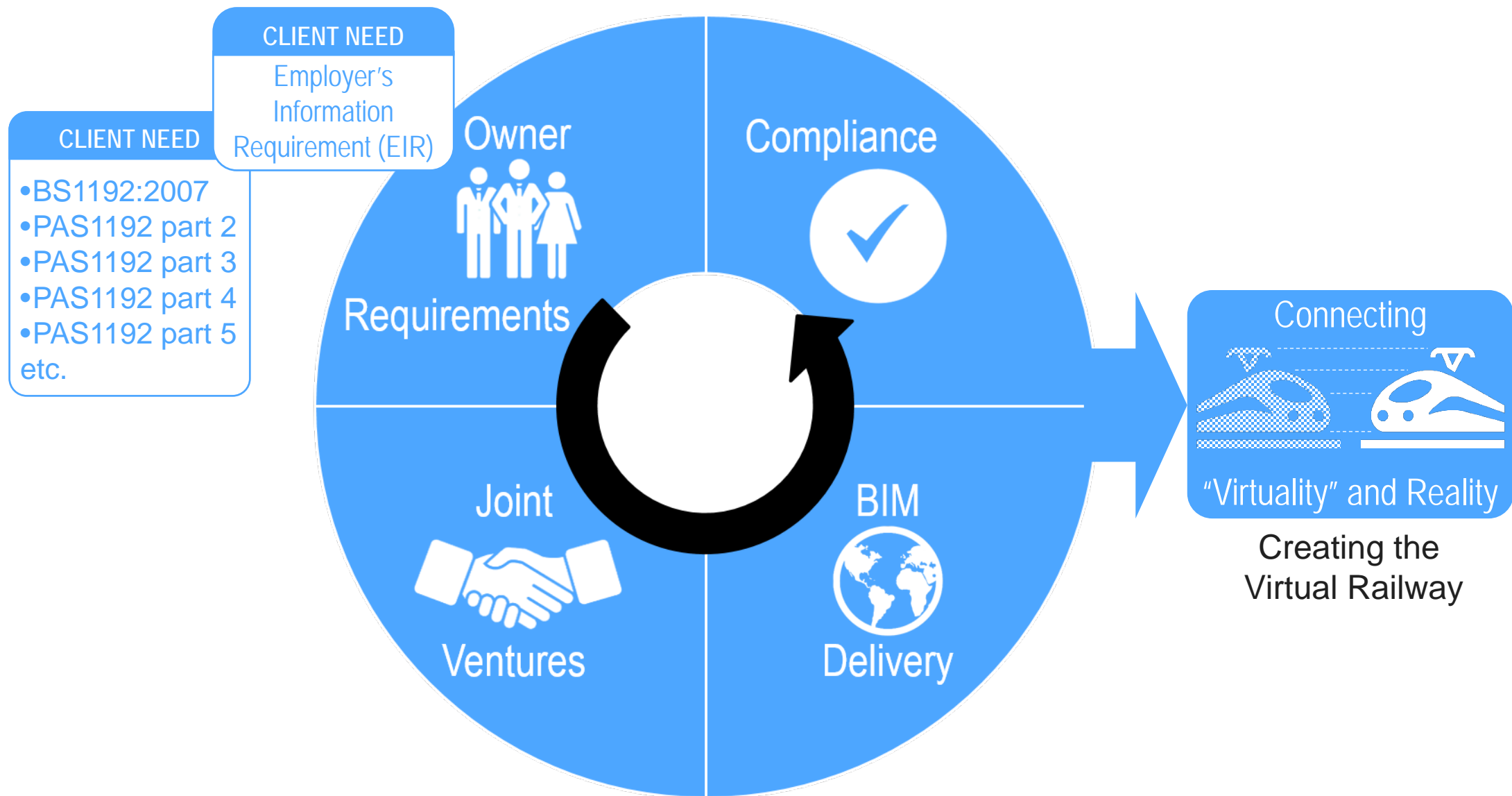
hs2  
engine for growth

Balancing Pond

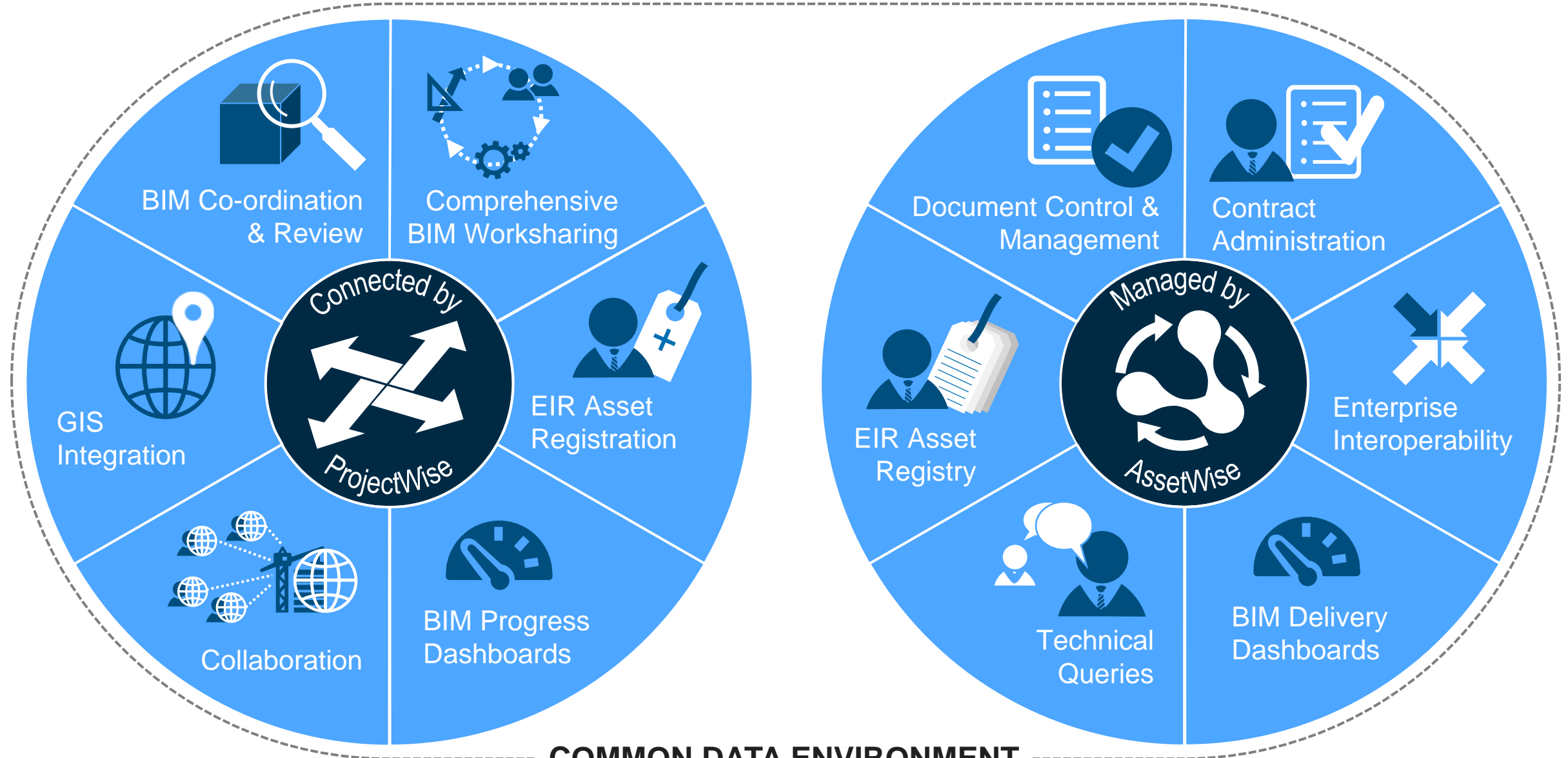
Balancing Pond

Overbridge

ARUP

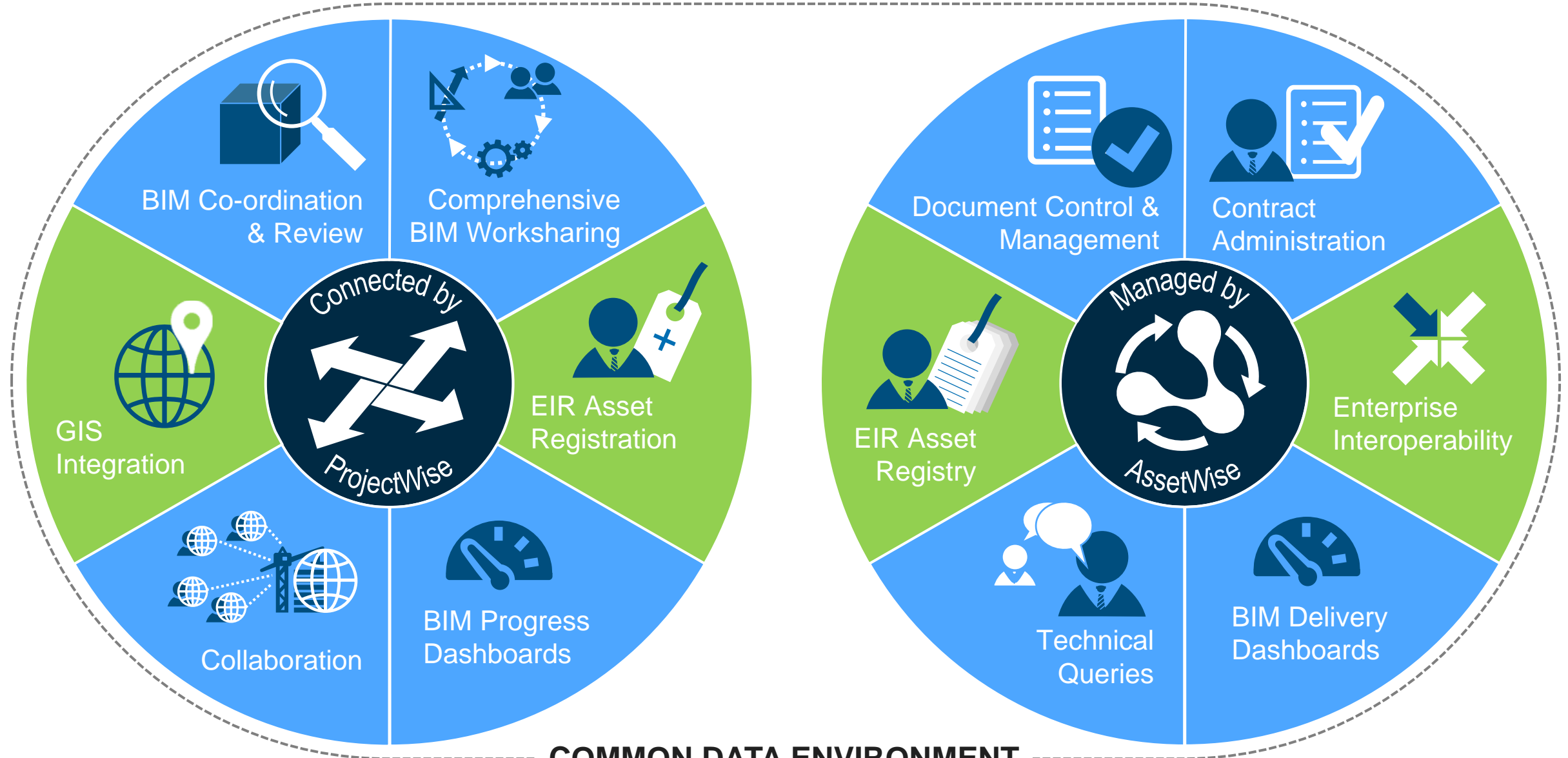


# HS2 BIM Delivery



**COMMON DATA ENVIRONMENT**

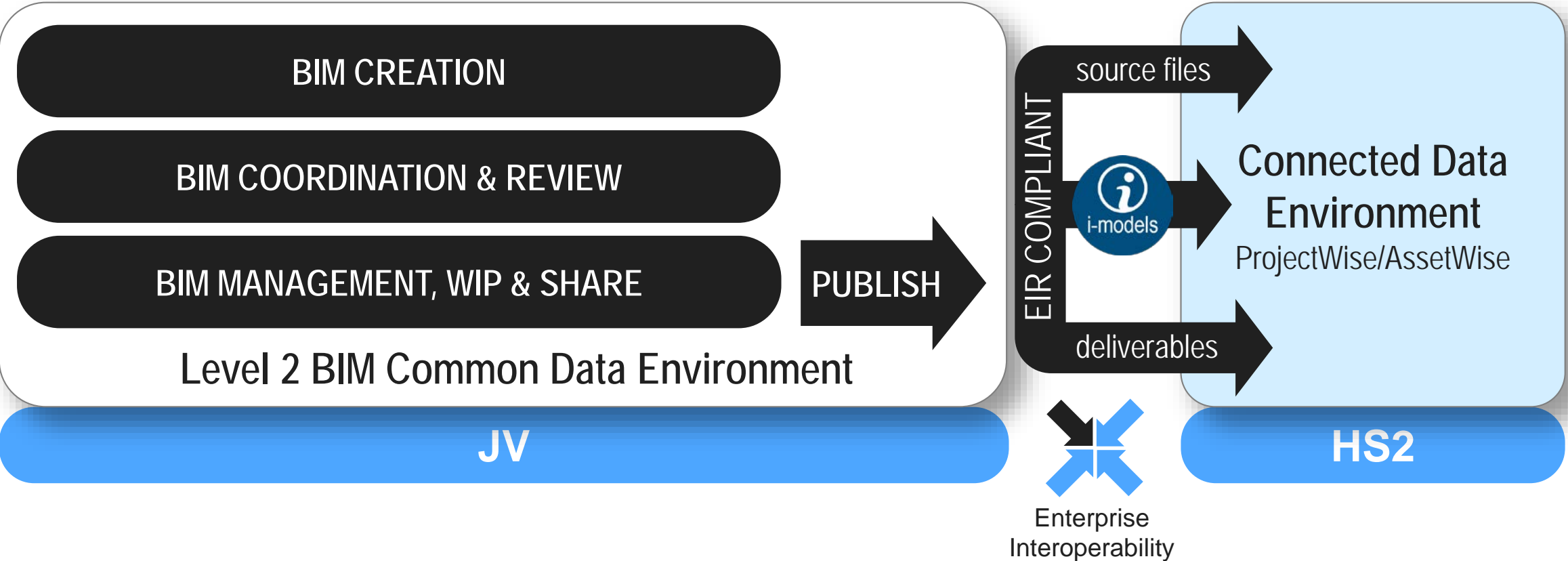
# HS2 BIM Delivery



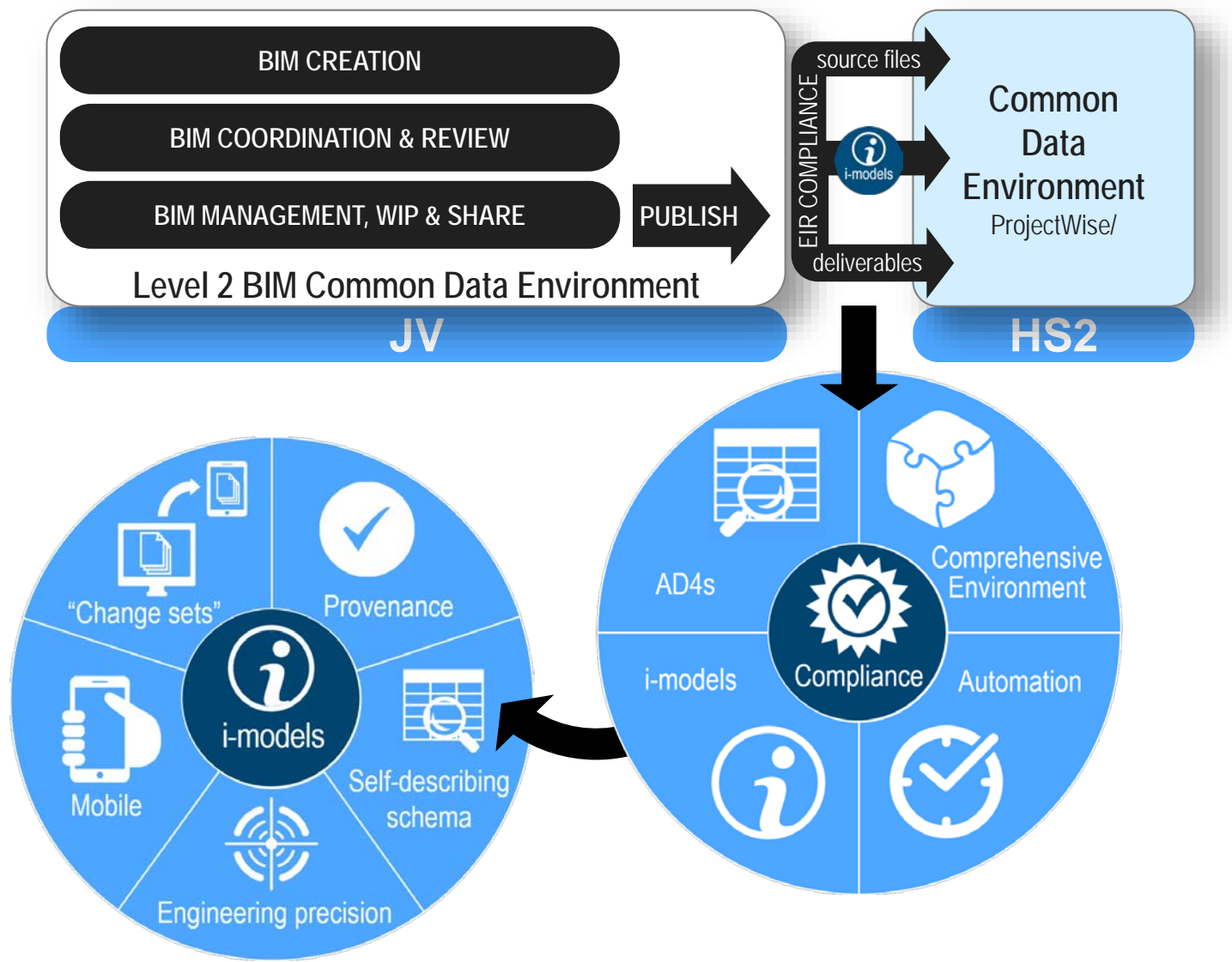
**COMMON DATA ENVIRONMENT**



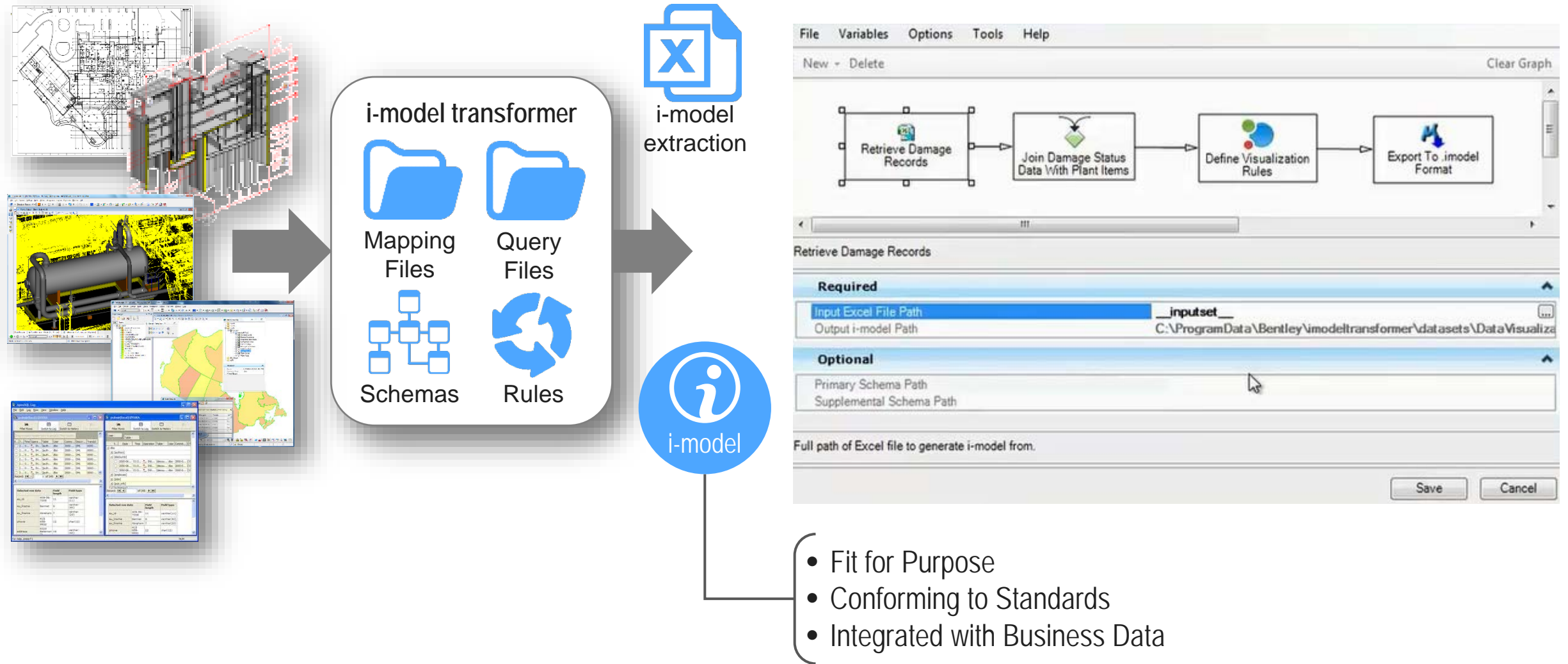
# Overview BIM delivery



# Overview Compliant Delivery



# i-Model Composition Server for i-Model





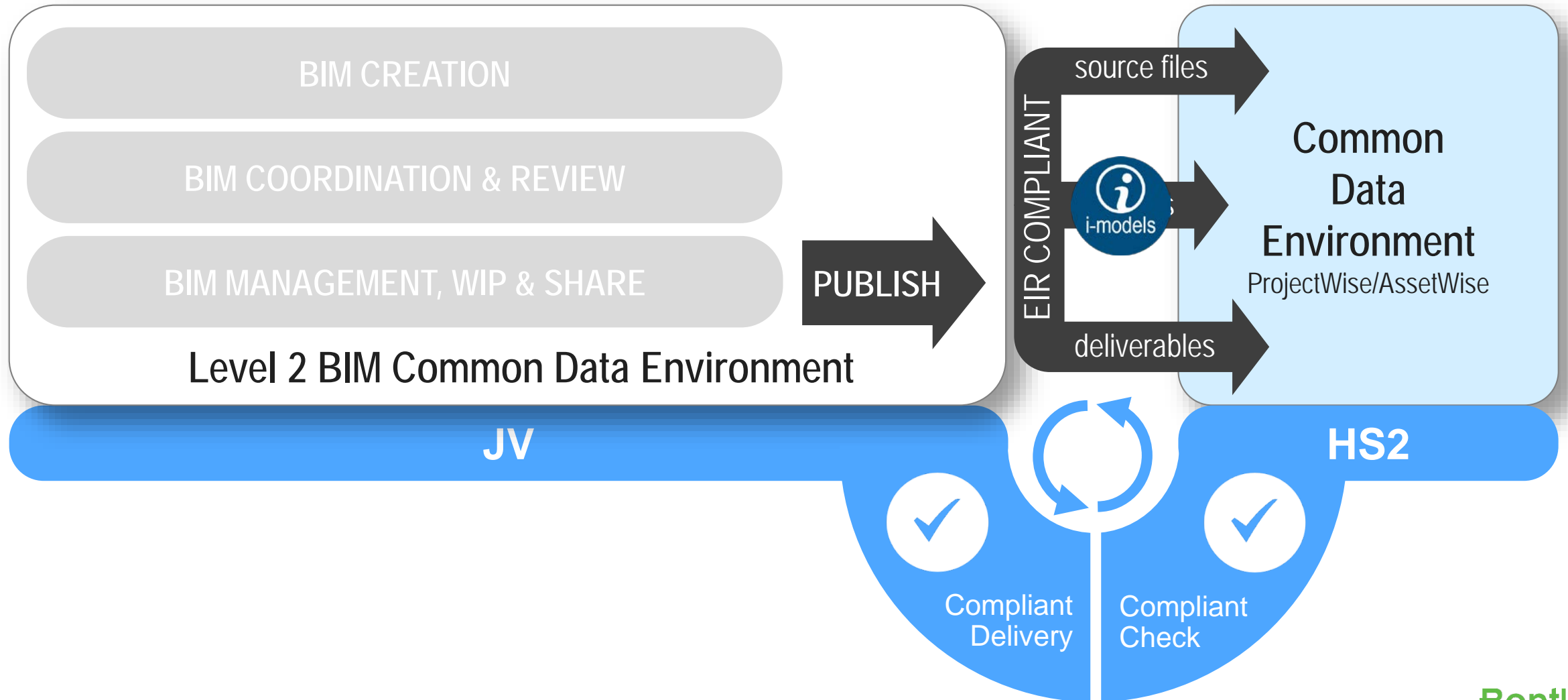


# Overview BIM delivery





# Compliant BIM delivery



# Decision making enablement

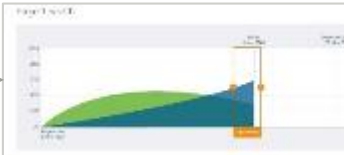
## Project Dashboards



Aggregate across Projects



Project 3 Analytics



Project 1 Analytics



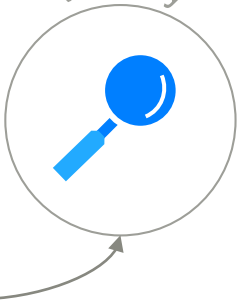
Project 2 Analytics



Project Performance

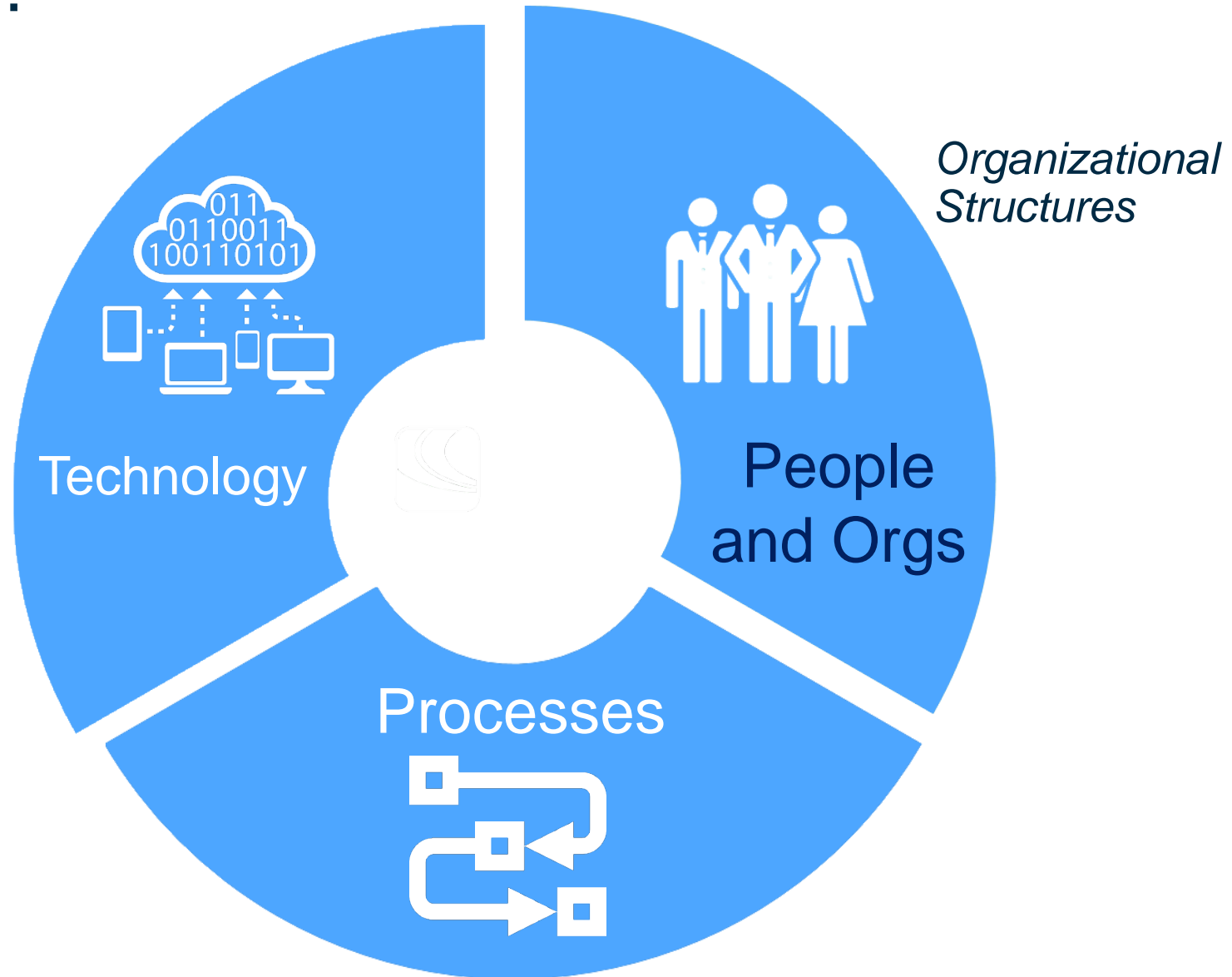


Visibility

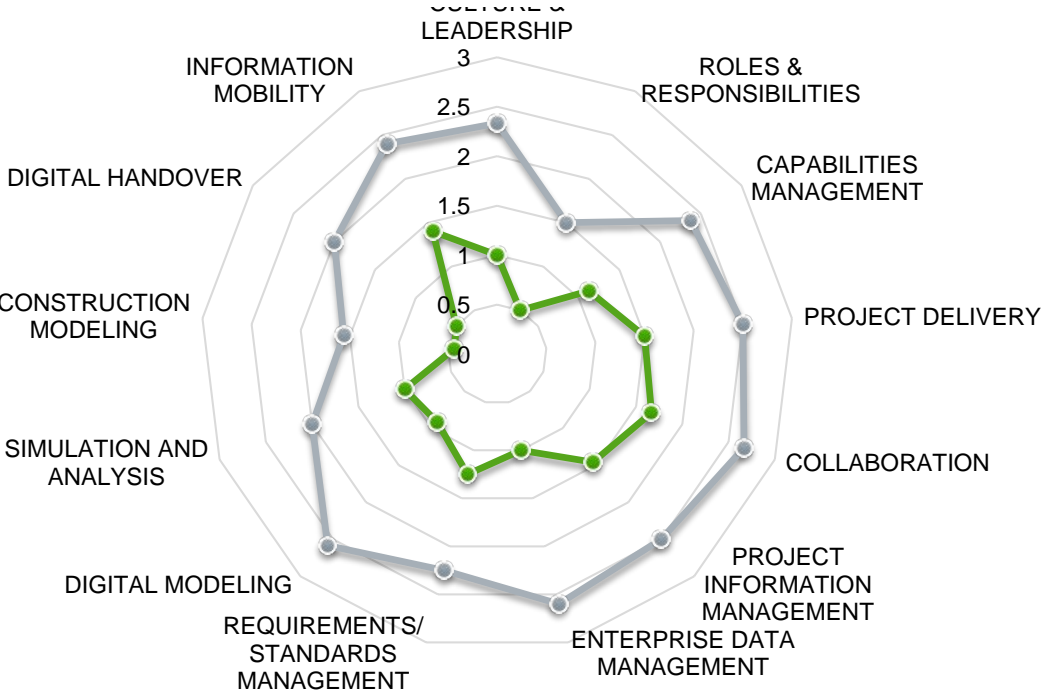




# Going Digital...



# Organisational Maturity



People		
Culture & Leadership	Roles & Responsibilities	Capabilities Management

Process				
Project Delivery	Collaboration	Project Information Management	Enterprise Data Management	Requirements & Standards Management

Technology				
Digital Modelling	Simulation & Analysis	Construction Modelling	Digital Handover	Information Mobility

Maturity Level 1  
Initial/Learning

- The organization is aware of BIM
- BIM is not currently being applied

Maturity Level 2  
Defined/Applying/Repeatable

- The organization is aware of the importance of BIM
- Now starting to implement

Maturity Level 3  
Managed/Embedding

- The organization is developing its BIM activities & processes
- Now implementing & embedding them across certain functional groups within the organization

Maturity Level 4  
Integrated

- BIM activities & processes are embedded, applied and integrated through the main functional groups within the organization

Maturity Level 5  
Optimised

- BIM activities & processes are now implemented & fully integrated across the Extended Project Enterprise
- Current BIM activities & processes are continuously improved to embrace 'next' practices & to optimize current & future project performance

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# Digital Transformation Roadmap



## Benefits Phase 1

- Single Source of Through Foundation
- On-cost on-budget CAPEX assurance
- Informed and reliable procurement
- Better collaboration and communication
- Better informed organisation

## Outcomes Phase 1

- BIM Level 2 maturity foundation
- ALIM Prove of concept

## Enablers Phase 1

- Project Mobilisation & Handover and Support Services
- Process and Strategy. Standards, Methods and Procedures
- Technology Implementation, Training and Support Services

Quale e` il costo di non farlo?



# Grazie e ...GO-DIGITAL!

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