

# Eliminating uncertainties and de-risking execution

Digital block driven project delivery



# Agenda

1. Capital Projects at a Glance & the Project Paradigm
2. Introducing “Containerization” and the Digital Construction Block™
3. The Digital Shift for Predictability, Acceleration & Control of Execution
4. De-risking Execution: The DIKW to PACE circular framework
5. The Method Improvement
6. Projects at a Vantage: Real jobs in Execution
7. The Sum is Greater than the Parts



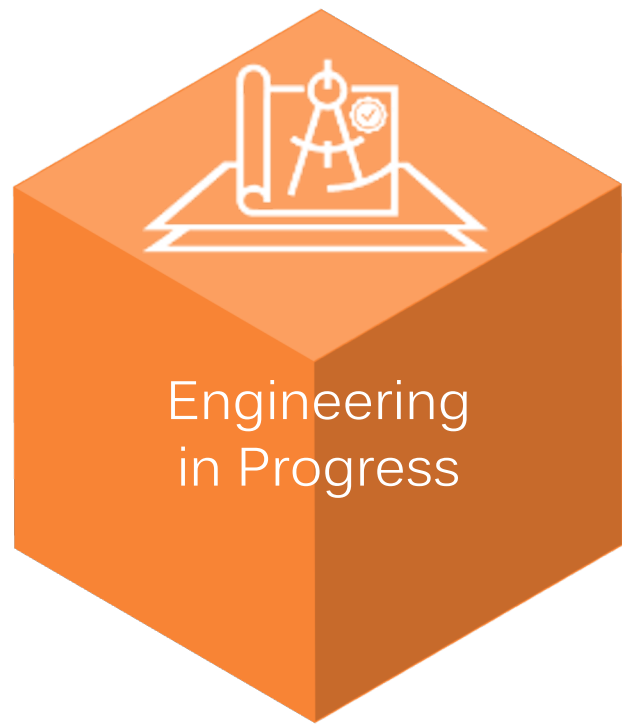
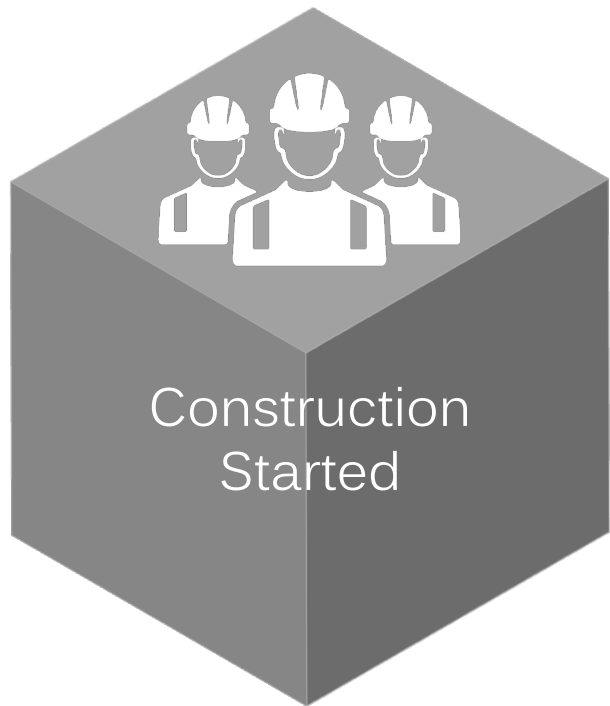


# What Every Project can Gain!

Visibility & Predictability

+ Efficiencies & Cost Savings

+ Acceleration & Optimization

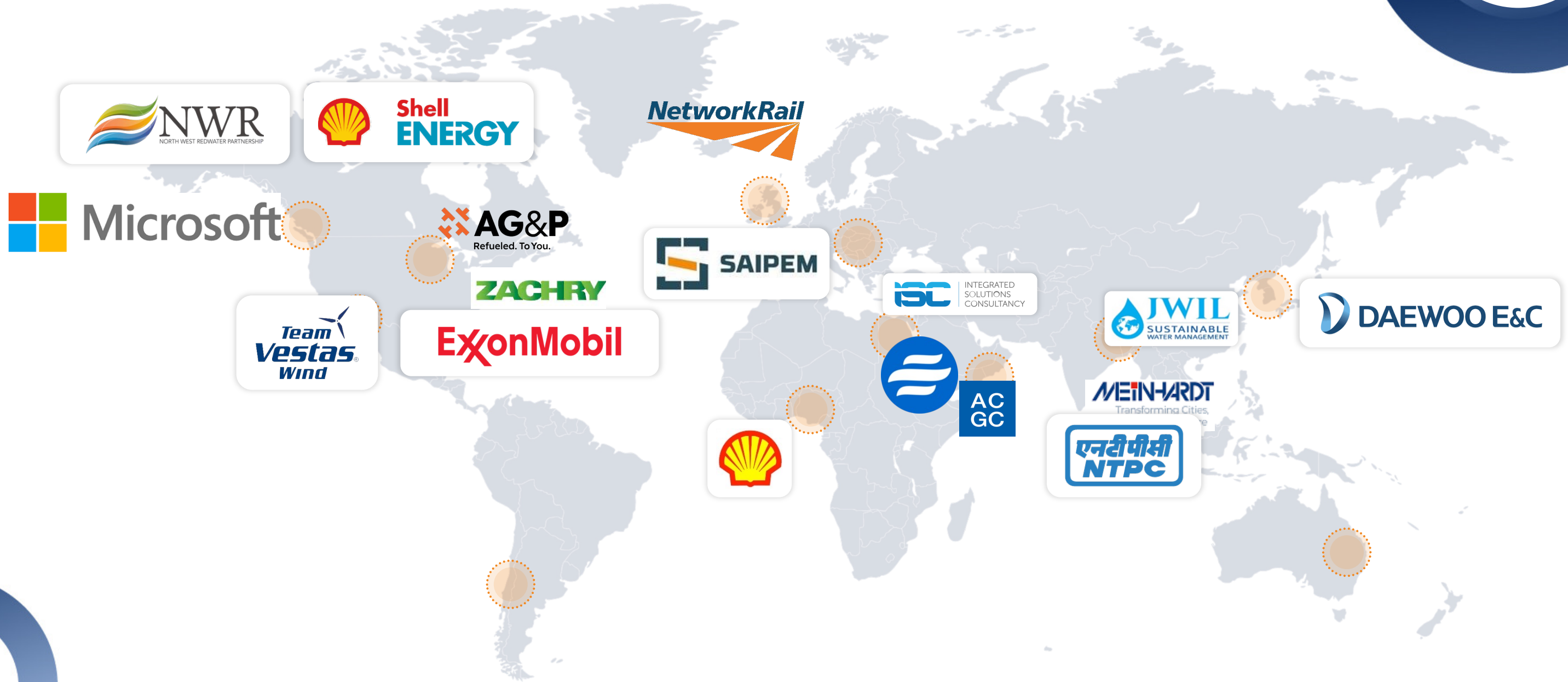


Projects already in Progress

New Build



# Clients & Projects at a Vantage





# The Capital Projects at a Glance

# Today, Across the Globe



North America  
55% Delayed  
51% Over Budget

Europe  
74% Delayed  
57% Over Budget

Middle East  
87% Delayed  
58% Over Budget

Asia Pacific  
80% Delayed  
57% Over Budget



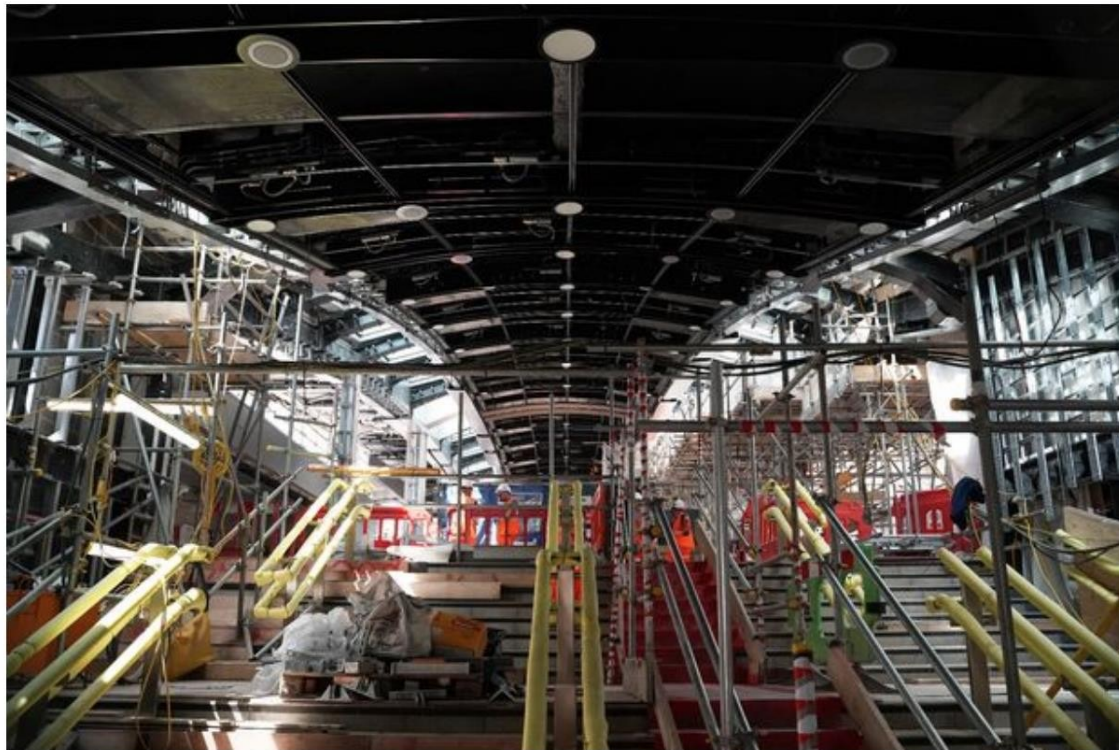


# Elizabeth line: The £19 billion Crossrail fiasco - 'Guessing what needed building', brazen sabotage and staff at war

**DELAYED 4 YEARS**

EXCLUSIVE: The full story of shambolic project plagued by delays and chaos  
**Billions wasted**

Crossrail: 'Build whatever you think'



At one station a whole ceiling was built based on what the contractors thought should have been installed, but when they checked with the design team, the whole thing had to be removed (Image: Chris BevanLee)



A report found that many of the mistakes on the project were driven by the obsession with a fixed completion date (Image: Leon Neal/Getty Images)



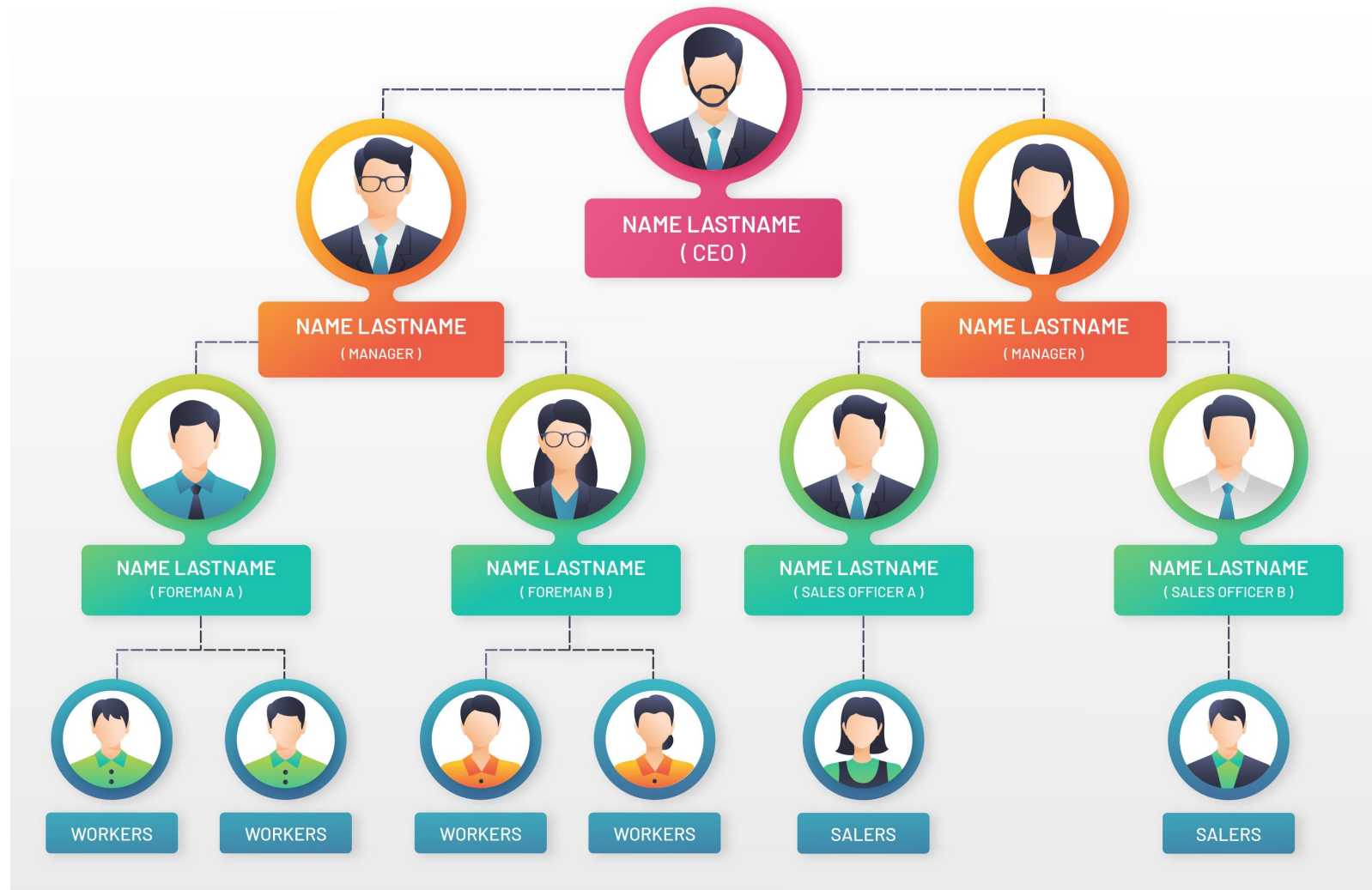


# The Project Paradigm





# People



People – may or may not be the problem; everyone wants to do a good job





# Process

Everyone knows what to do

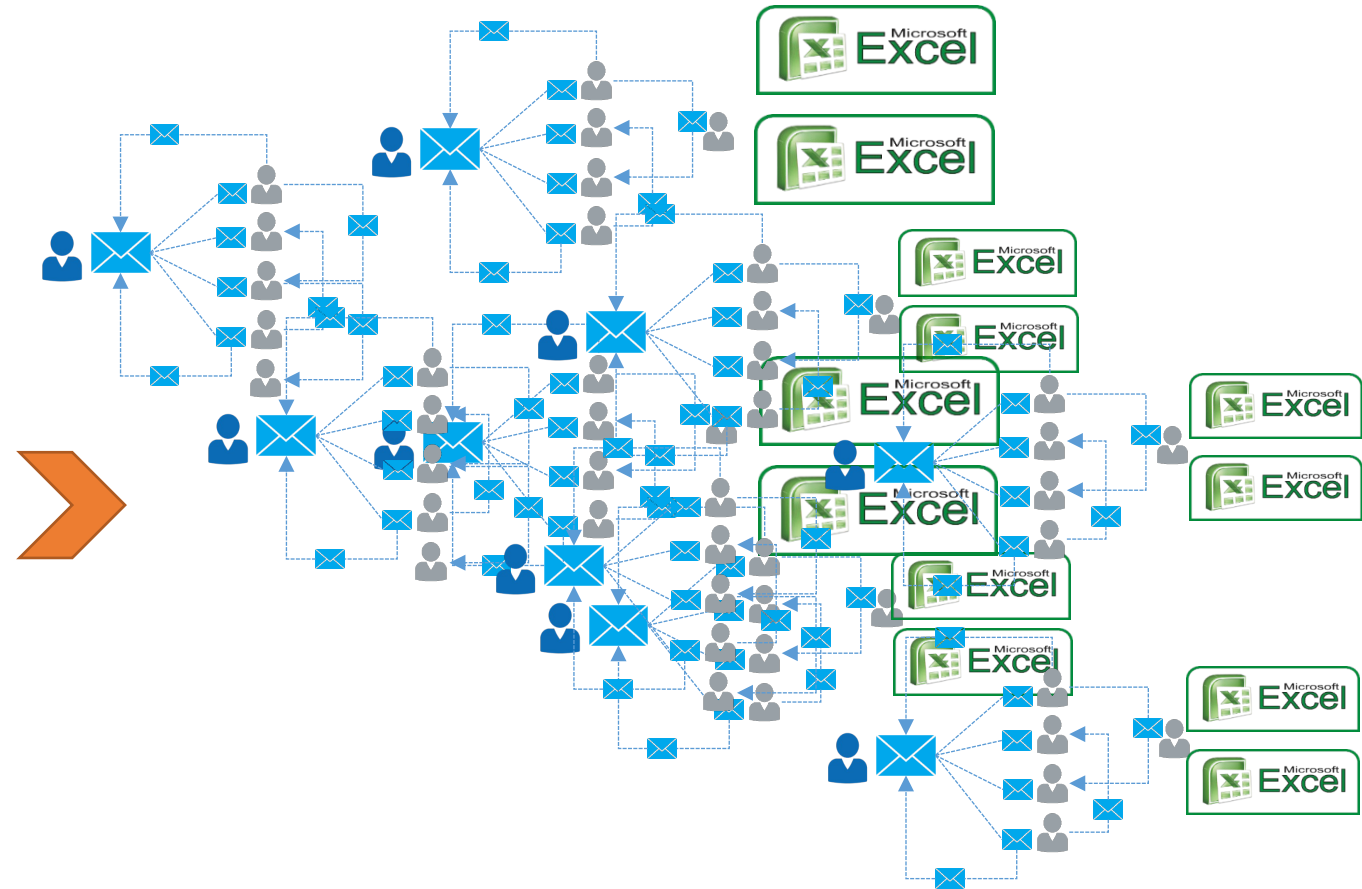
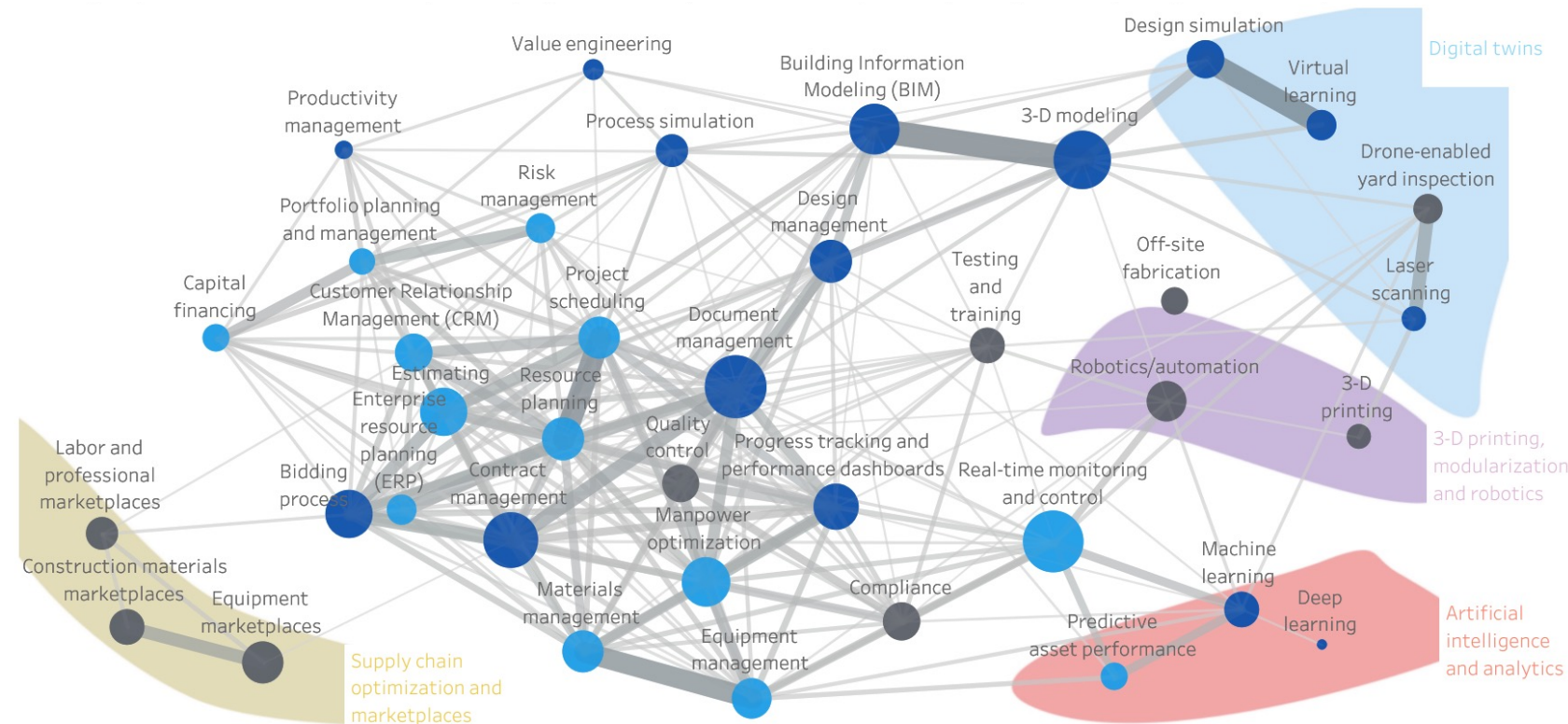


# Technology

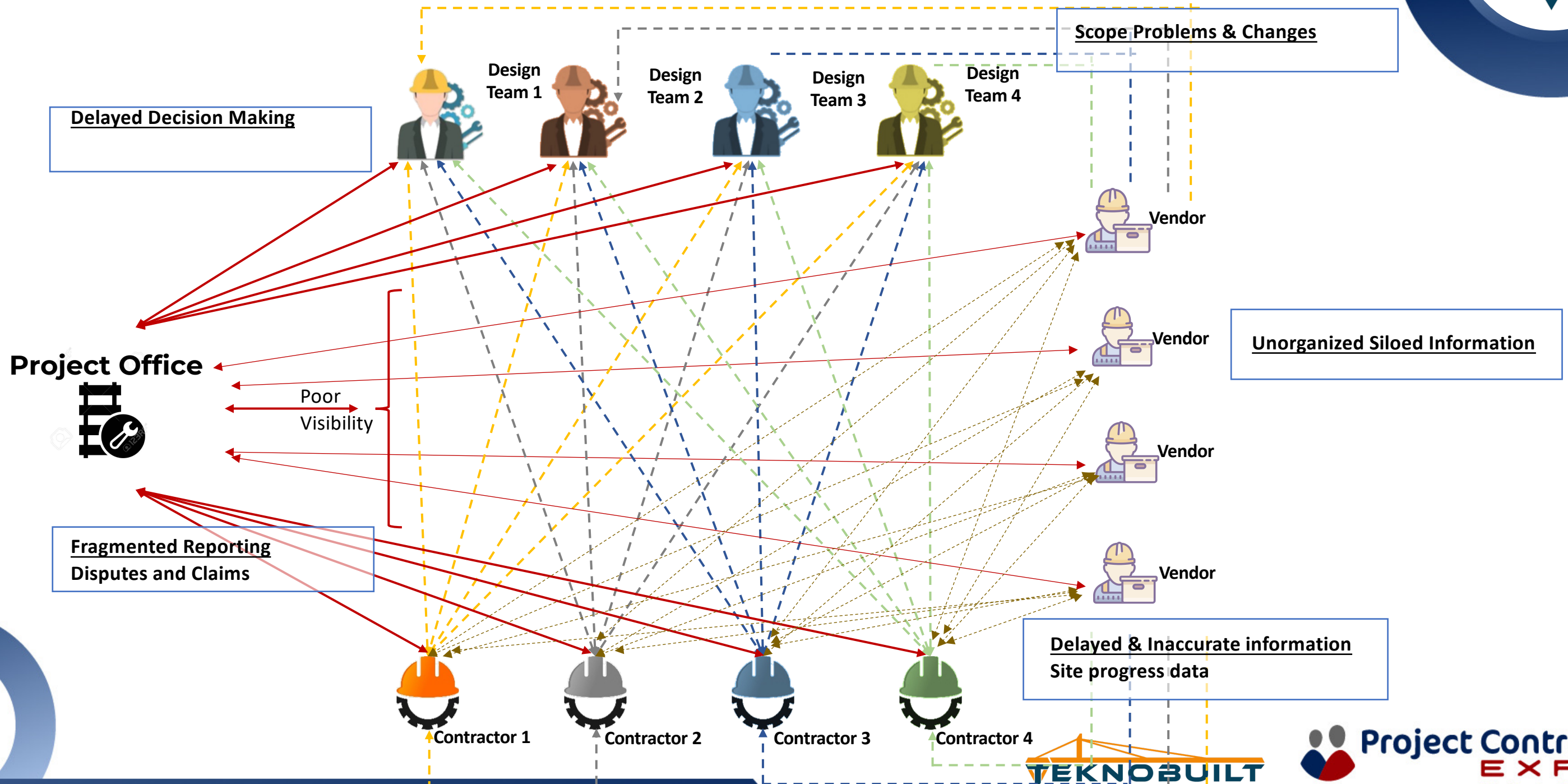


Systems & Tools: Many

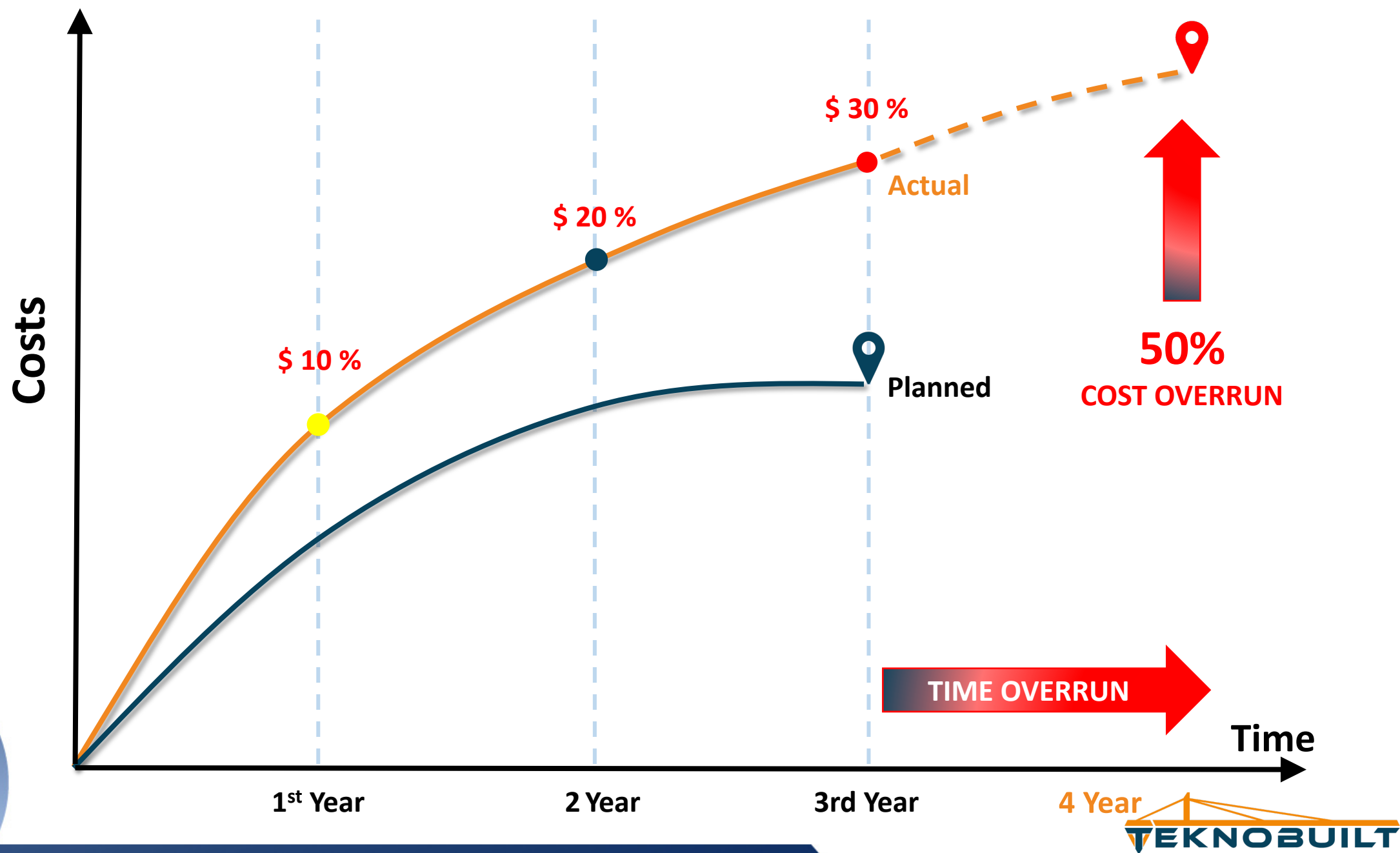
No lack of Data: Data is everywhere



# The Project Paradigm



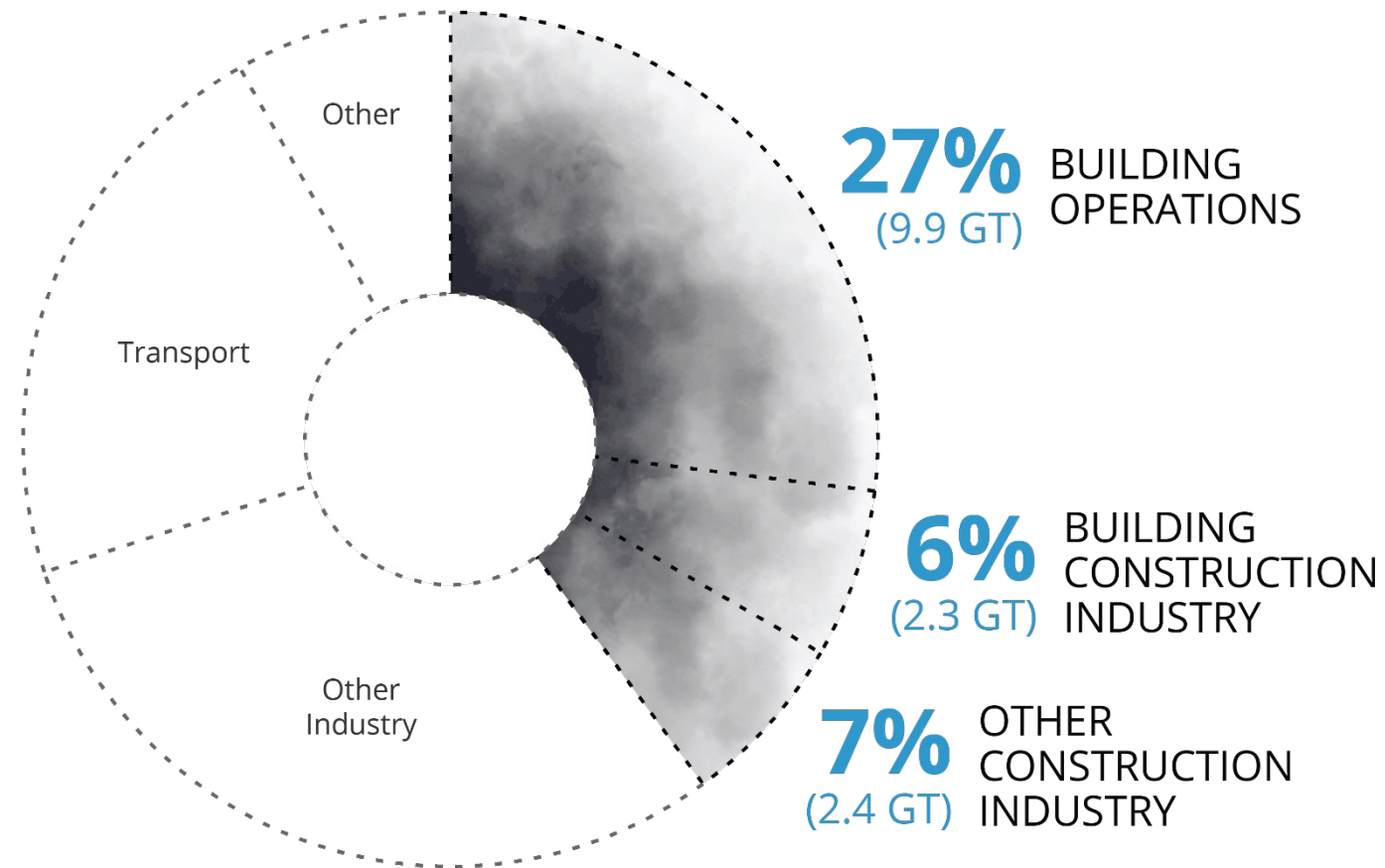
# Late Risk Identification Adds 3% cost every month



# Built Environment Generates 40% of CO<sub>2</sub>



Annual Global CO<sub>2</sub> Emissions



© Architecture 2030. All Rights Reserved. Data Source: IEA (2022), Buildings, IEA, Paris

*Building Construction Industry and Other Construction Industry represent emissions from concrete, steel, and aluminum for buildings and infrastructure respectively.*





# The “Controls”

# “Poor Execution”



Fabrication

Owner

Engineering

Procurement

Construction / Management

Sub-Contractors

Contractual & Organizational Fragmentation

Time based segregated horizons and location based disconnects

Systems & tools, Data Fragmented

Process discontinuity & interruptions

Erection, installation, completion

Commissioning & Start-up

Owner / Operator







# Introducing “Digital Construction Block™” and the Block Driven Project Delivery



# The Digital Construction Block™

- a Multi-dimensional Kanban Container™



- Dynamic, goes live from project start
- Build focus – area and sequence
- Dynamically aligns scope between Construction & Engineering
- Proves field execution readiness and control progressively
- Supported by functions such as Project Controls, Supply Chain & Quality
- May have multiple Assets within
- May have multiple Systems within
- Connected to the Unified Delivery Network



# Containerization: Revolutionizing Concept in 1950s

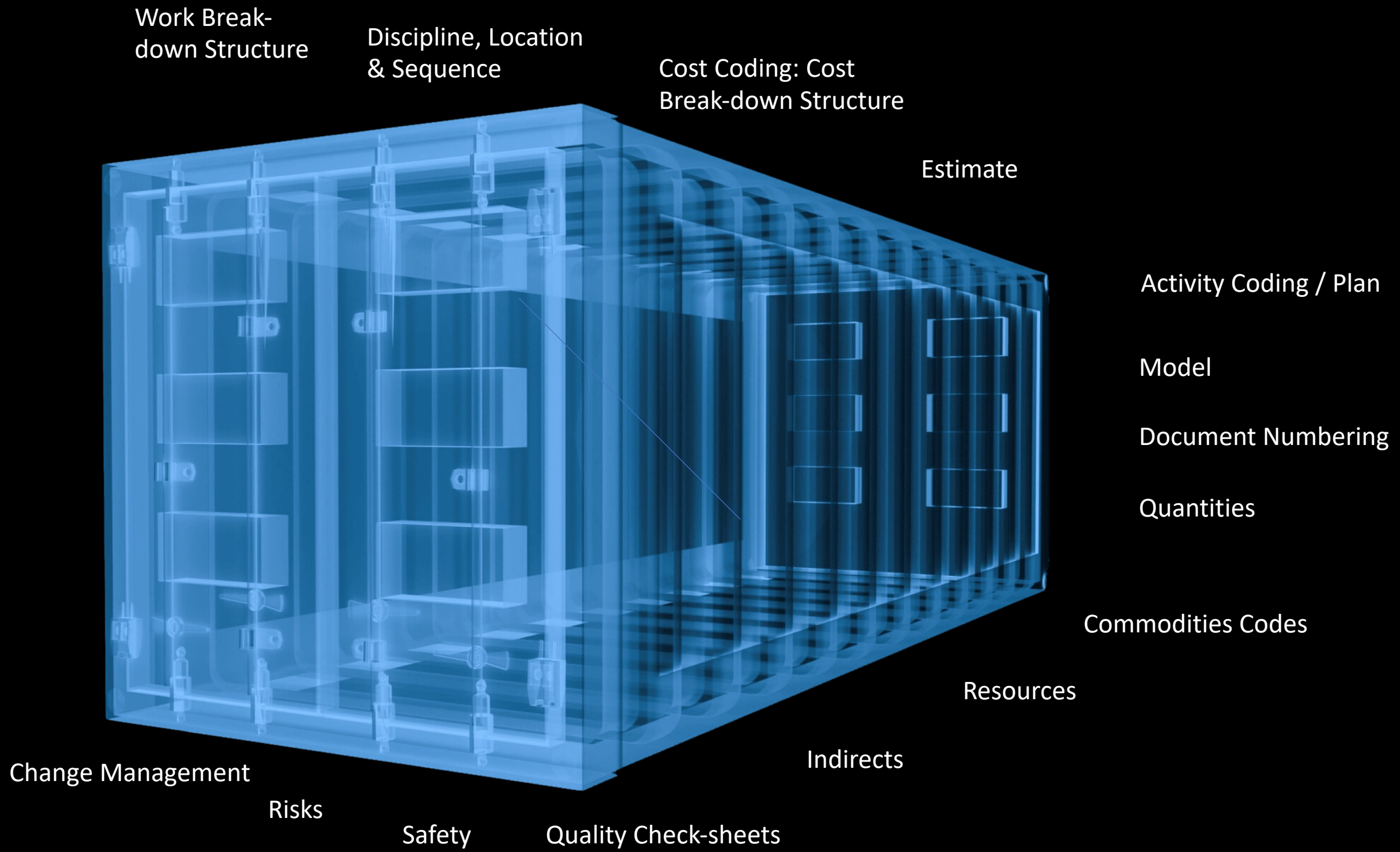


- 20 times faster
- Dramatically reduced costs
- Transformed transportation and international trade
- Globalization

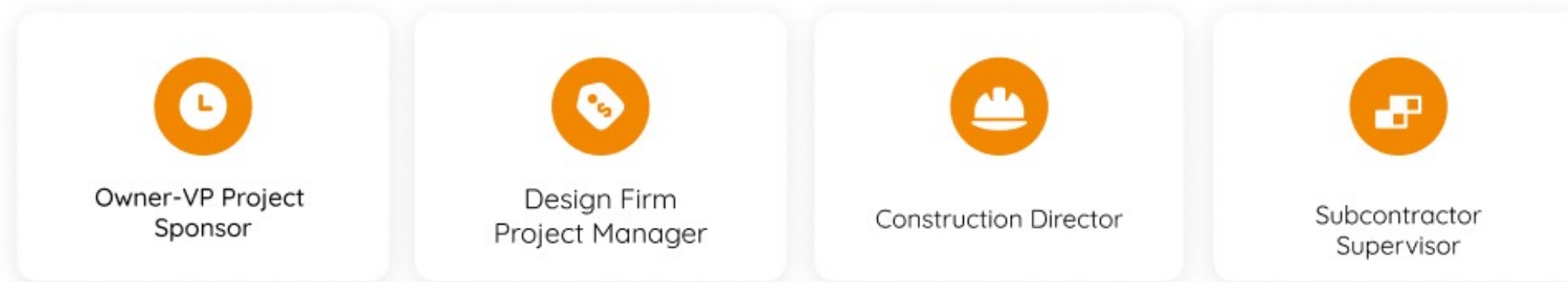
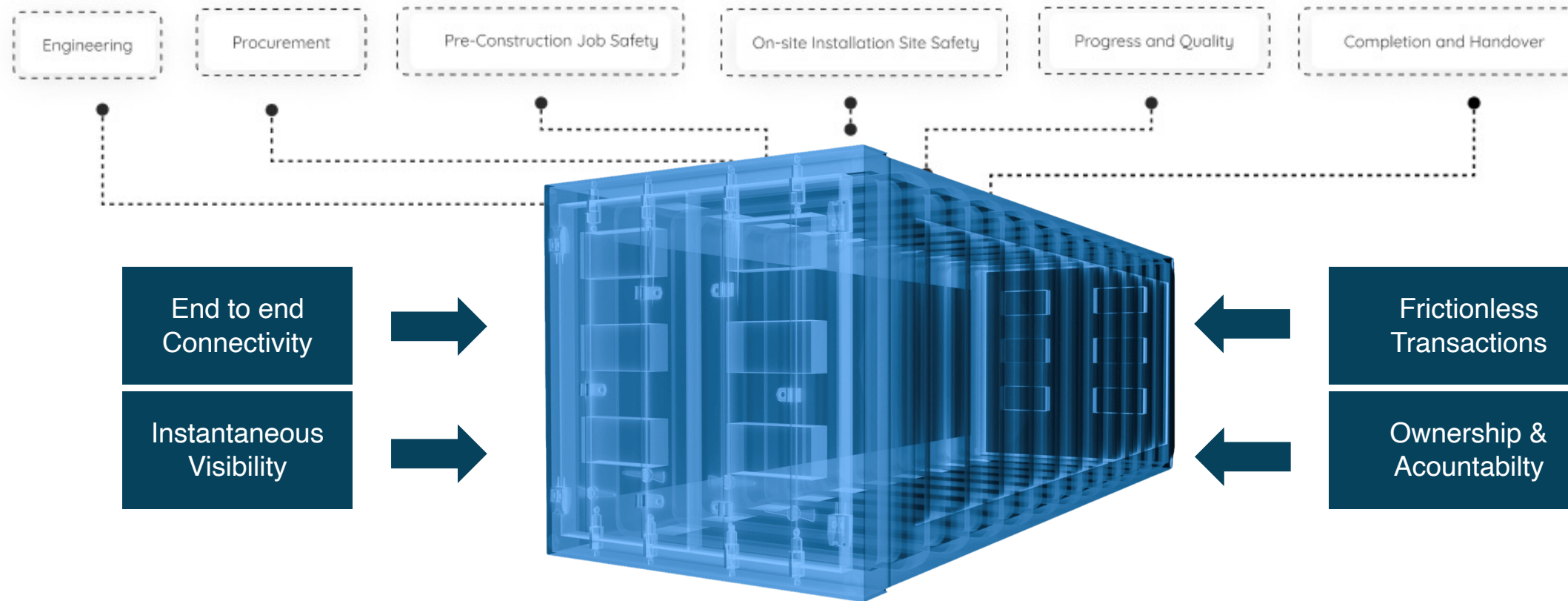




# The "Container" Revolutionized the World



# The Multi-Stage & Organization Connectivity



# Blocks Flow Faster on a Digital Assembly Line

Network View

✖



## Document Register

● M714-CE-E-12121 / T-14.112.121
● M714-CE-E-12123 / T-14.112.123
● M714-CE-B-12120 / T-14.112.120
● M714-CE-B-12122 / T-14.112.122

## Engineering Deliverable

EWP-A01-WP2.3-220-FI-LC-101

	Plan	Actual
▶	2023-02-17	YYYY-MM-DD
📊	2023-02-17	2023-02-09
📄	0 hrs	0 hrs

## Pre-Construction Planning

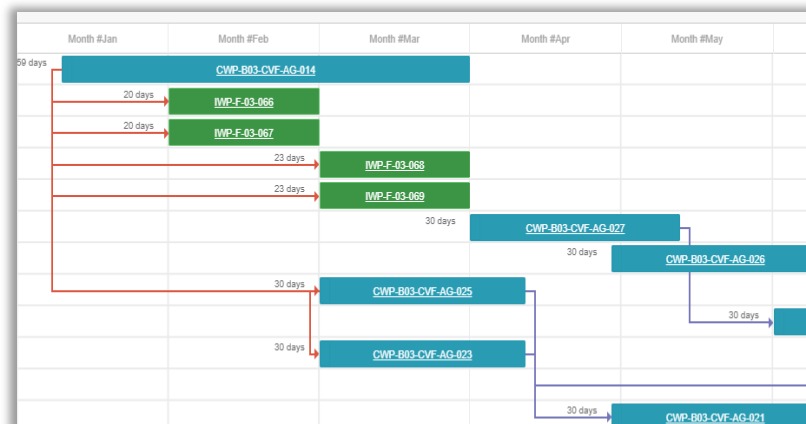
CWP-A01-WP2.3-220-FI-LC-101

	Plan	Actual
▶	2022-12-31	2023-02-10
📊	2023-04-14	2023-02-10
📄	0 hrs	0 hrs

## Onsite Execution

...0-FI-LC-101-CV02-101
...0-FI-LC-101-CV02-102
...0-FI-LC-101-CV02-104

## Ref. CWP



TEKNOBUILT

ols  
EXPO  
Washington, DC - USA



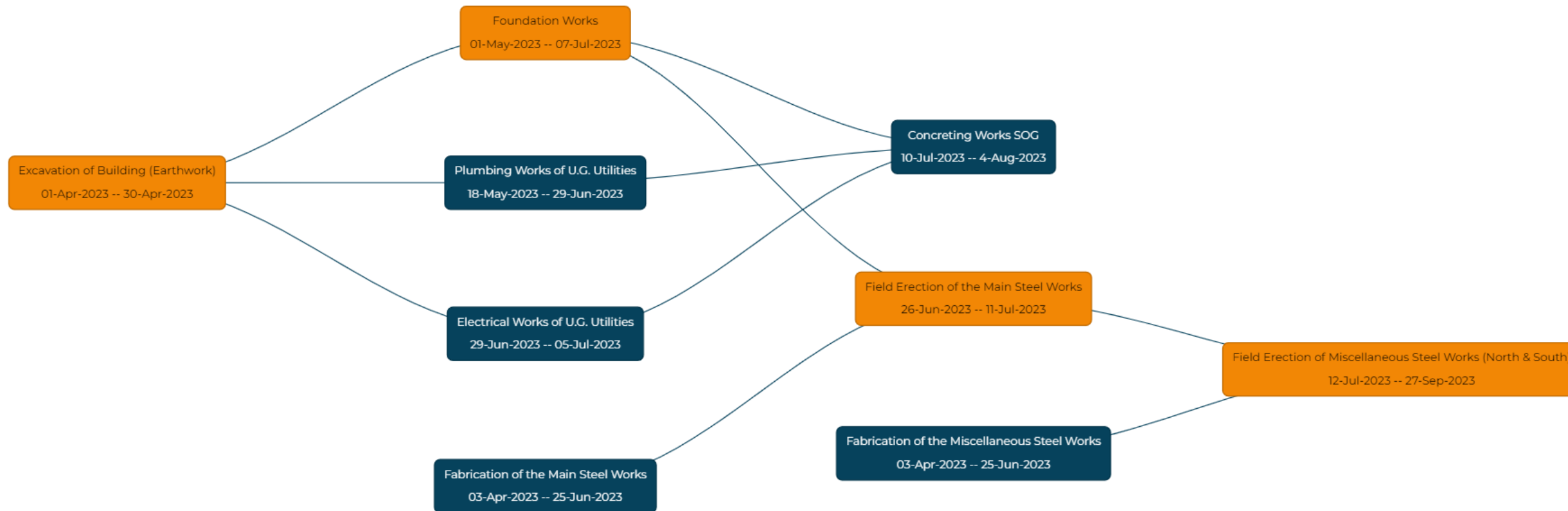
# Unified Block Delivery: Network View



Edit

Critical Work Block Execution:  
Total Duration 180 days

Reset



# No Disruptive Blocks

Easy Overlay on Existing Systems & Processes



Connectivity across Multiple Project Systems & Tools

# PACE OS Unified Platform



Platform for End-to-End Project Delivery with AI & GIS Technology



**EXPO**  
Washington, DC - USA



# The Digital Shift for Predictability, Acceleration & Control of Execution

# Parallels from Manufacturing to Construction



Need for End to End Optimization

Engineering & Construction

Phases

Design

Preconstruction

Construction

Operations and Management

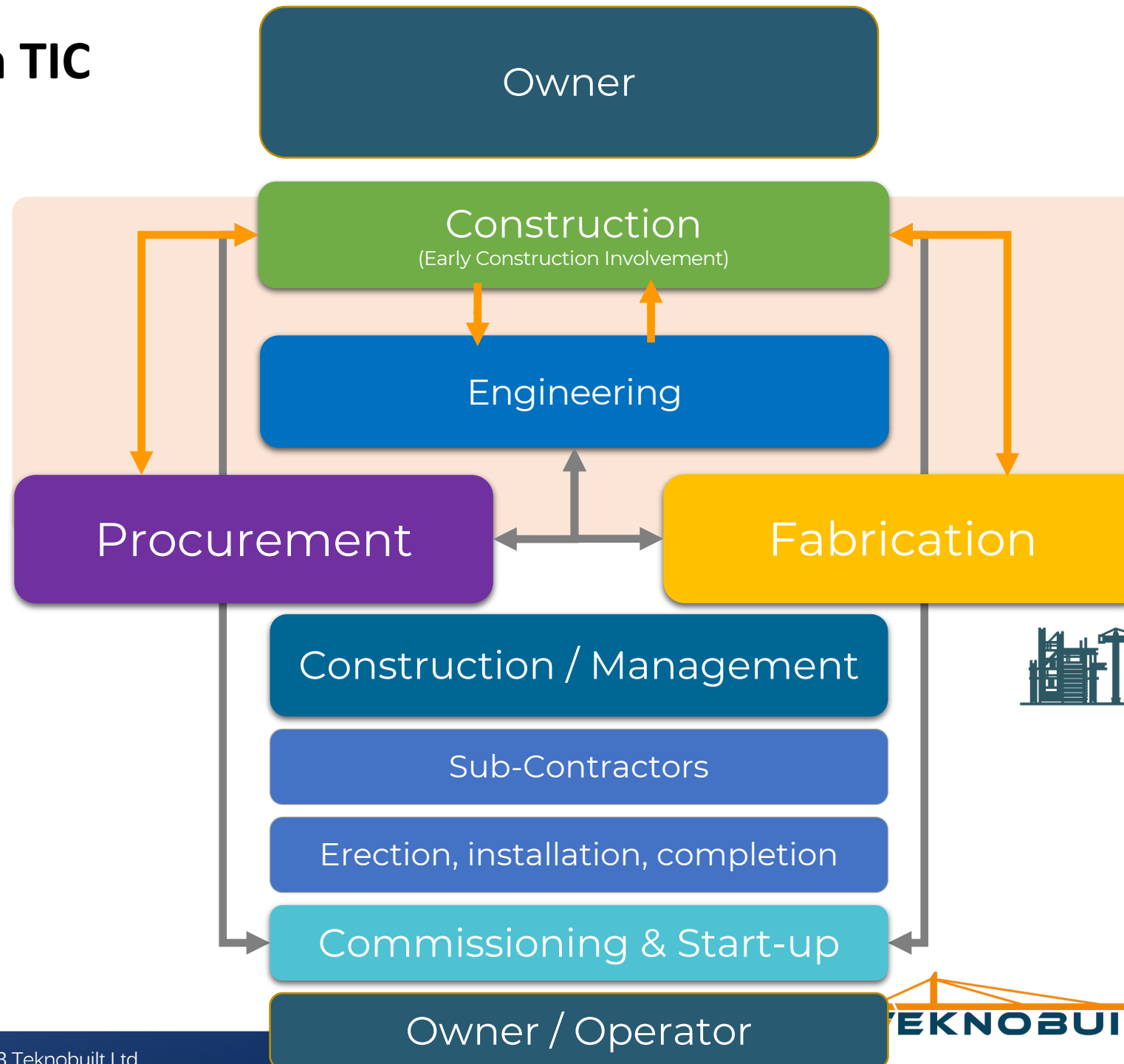
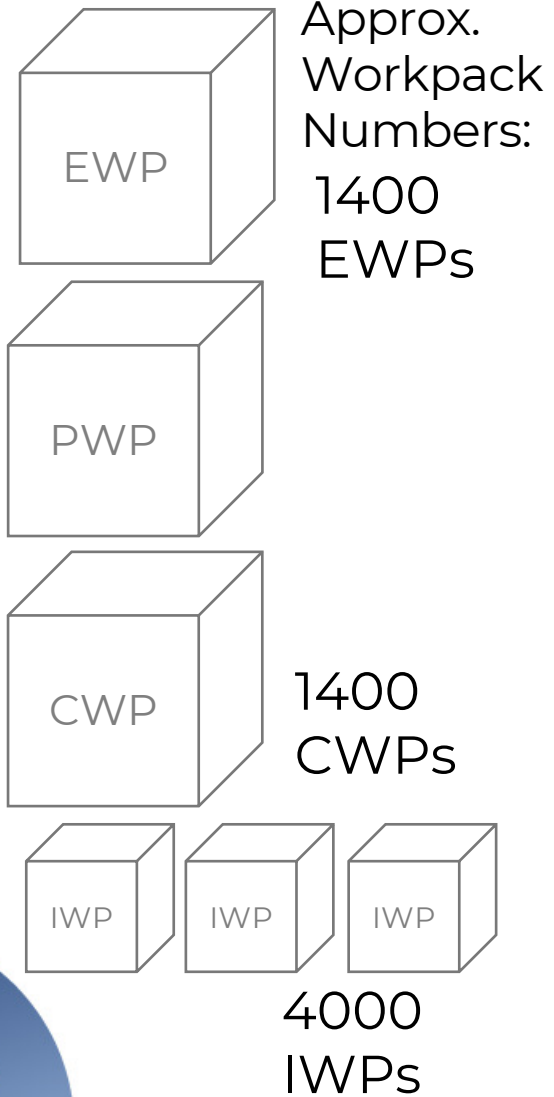
Safety and Performance Management



# The Execution Strategy by Containerizing



## Example of \$1 Billion TIC



**20% increased effort (investment) in good engineering**  
 (20% of 8% of TIC)



**Aggregated savings target of 8 to 10% in Construction**  
 (10% of 40% of TIC)

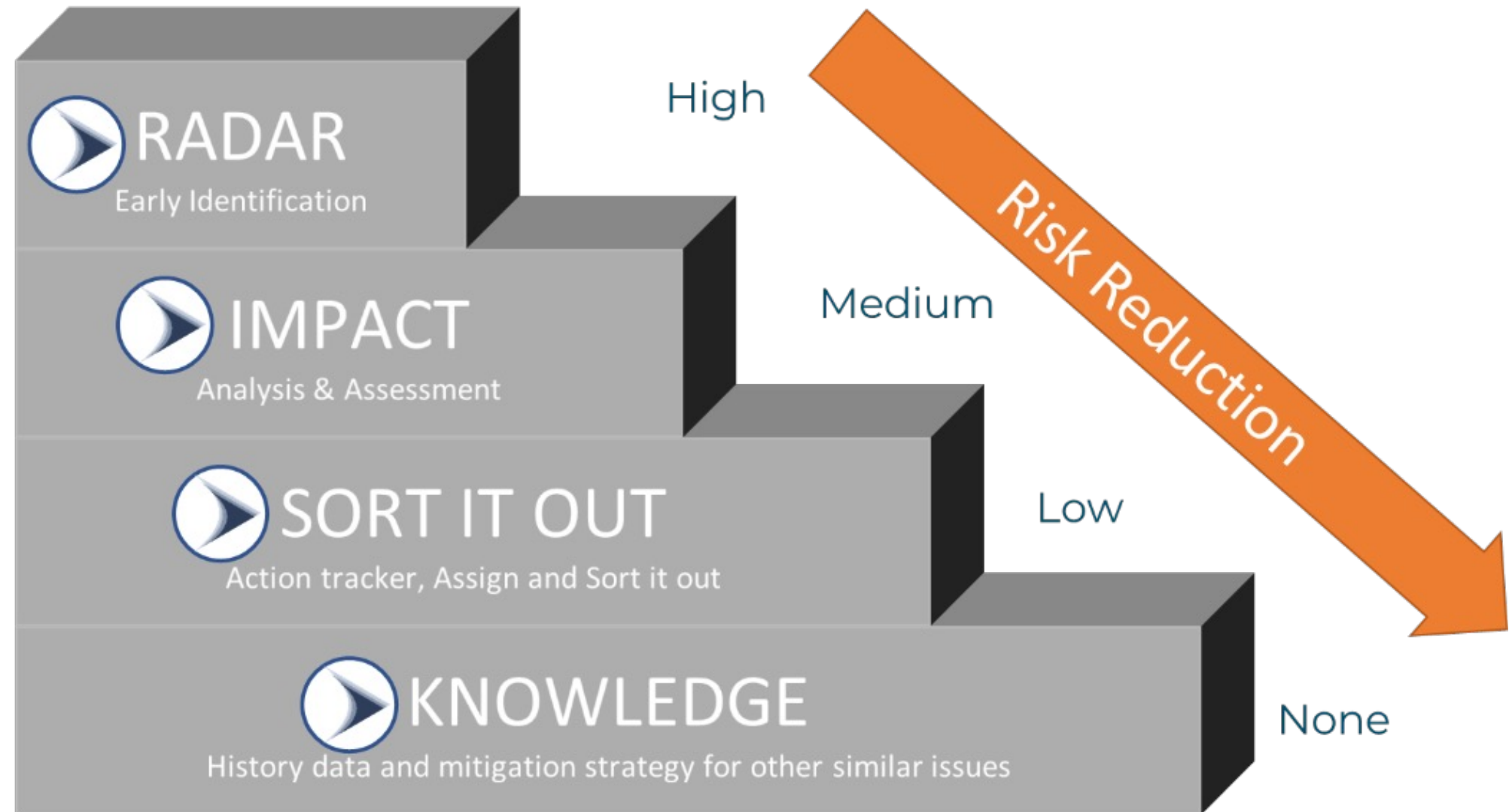




# De-risking Execution

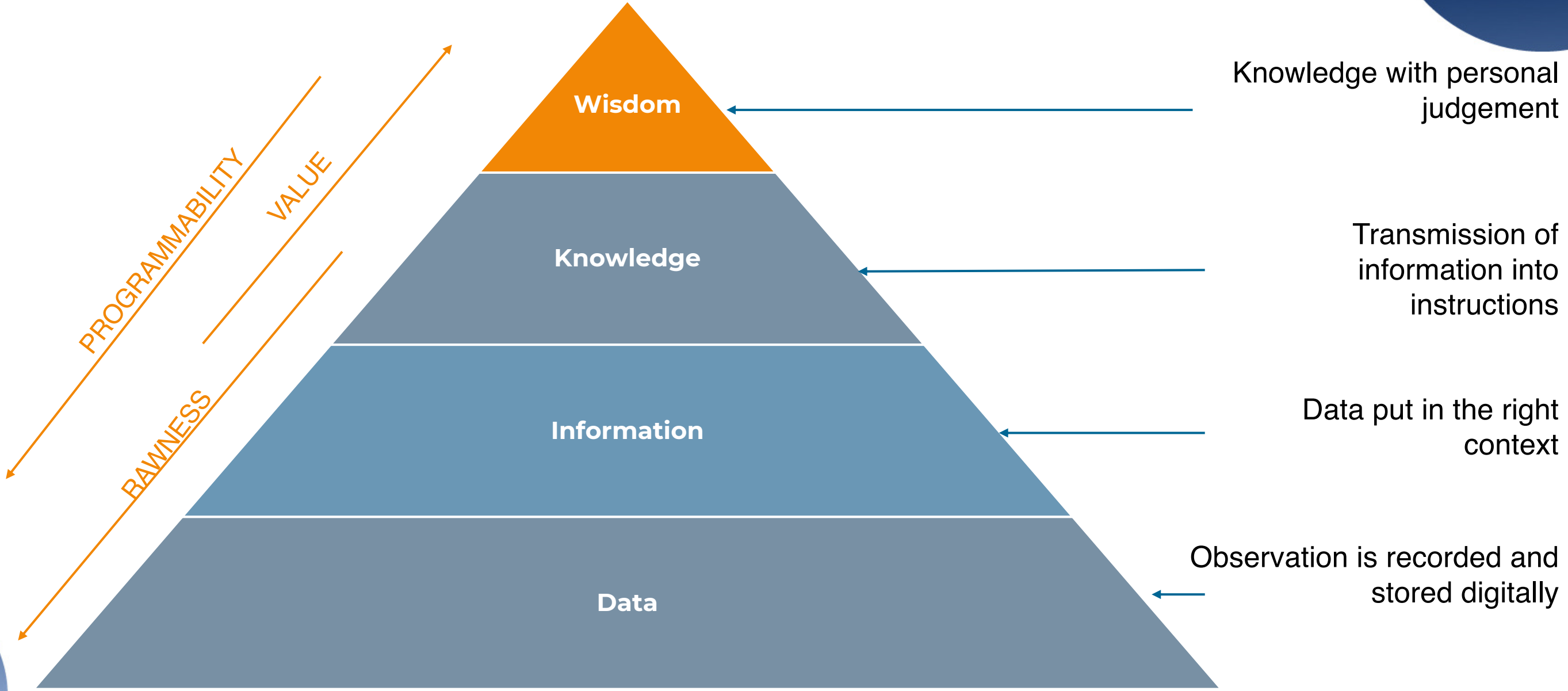
The DIKW to PACE circular framework

# De-risking Execution





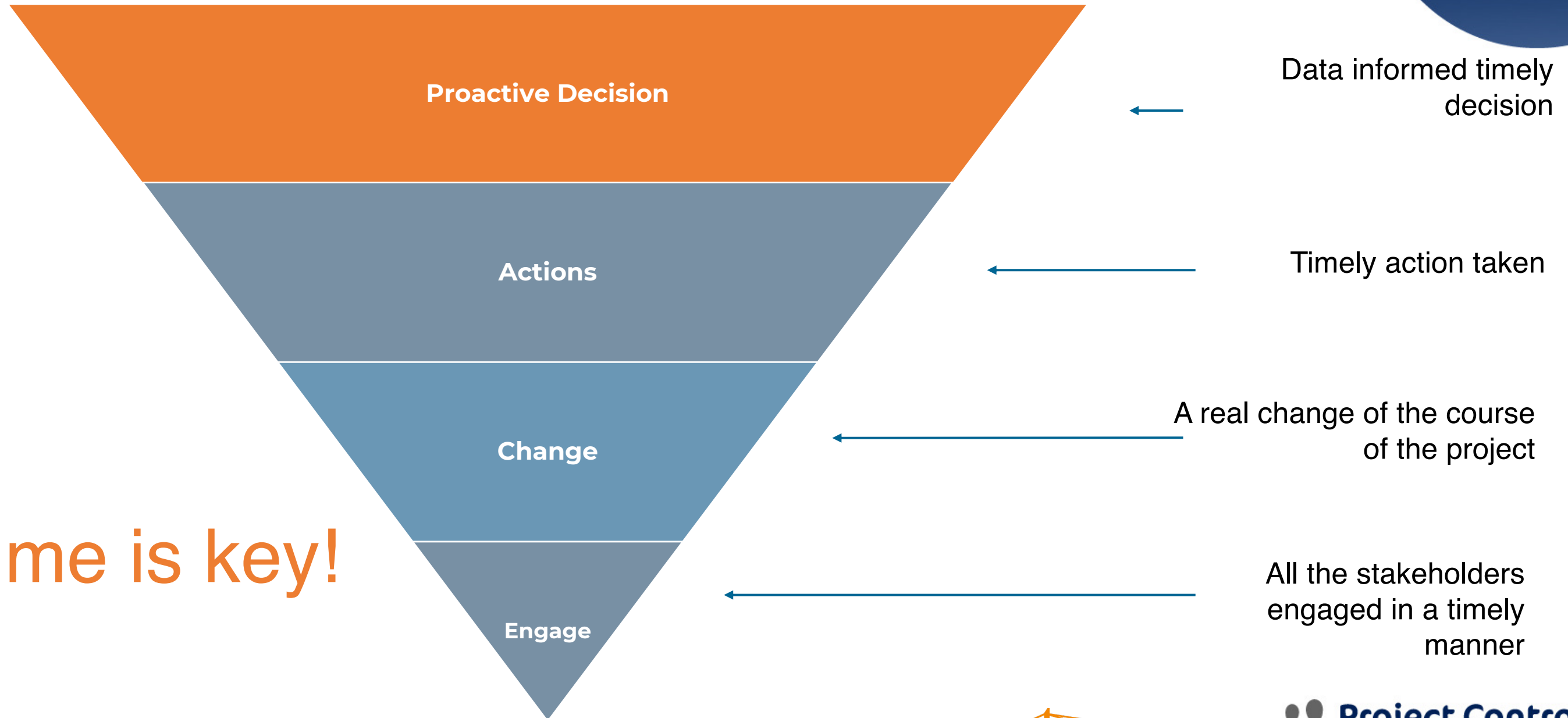
# Data-Information-Knowledge-Wisdom (DIKW) hierarchy



Rowley, Jennifer. "The wisdom hierarchy: representations of the DIKW hierarchy." *Journal of information science* 33, no. 2 (2007): 163-180.



# Pace Intelligent Funnel



Time is key!



# Operational Discipline & Execution Control



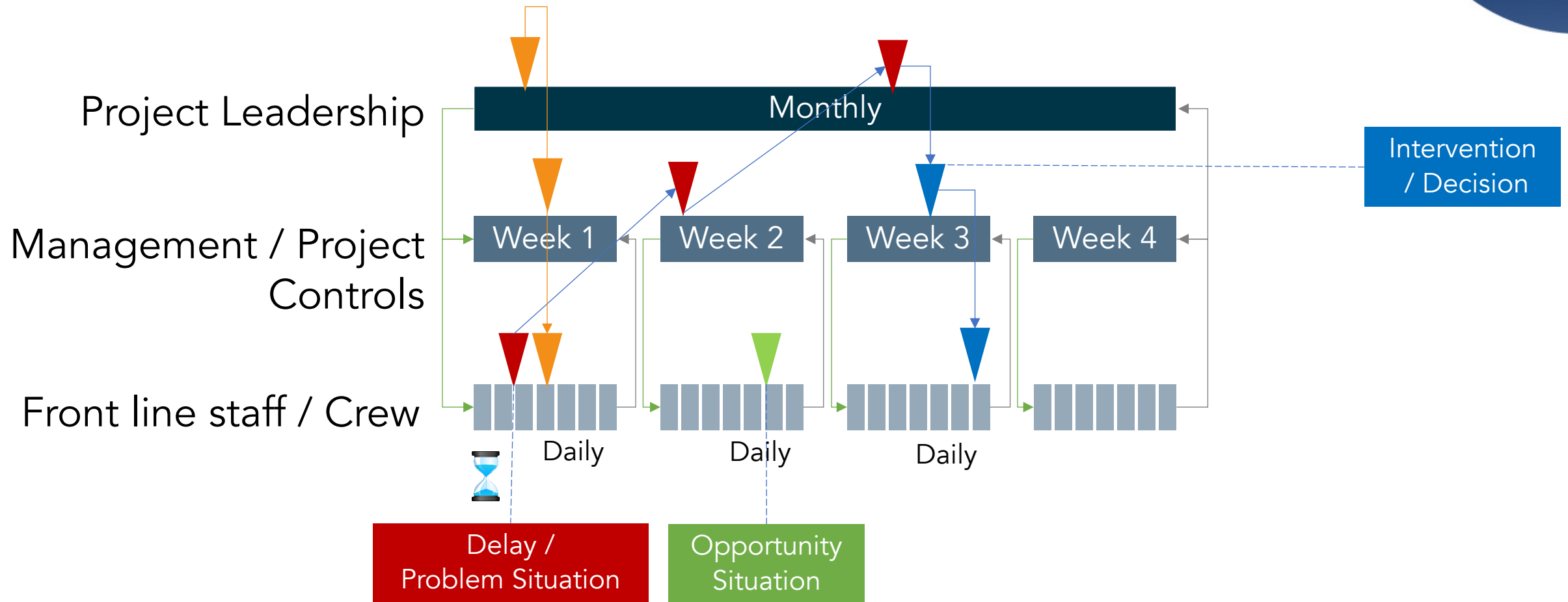
Digital Control Tower



Hindrance Management



PACE Site Mobility



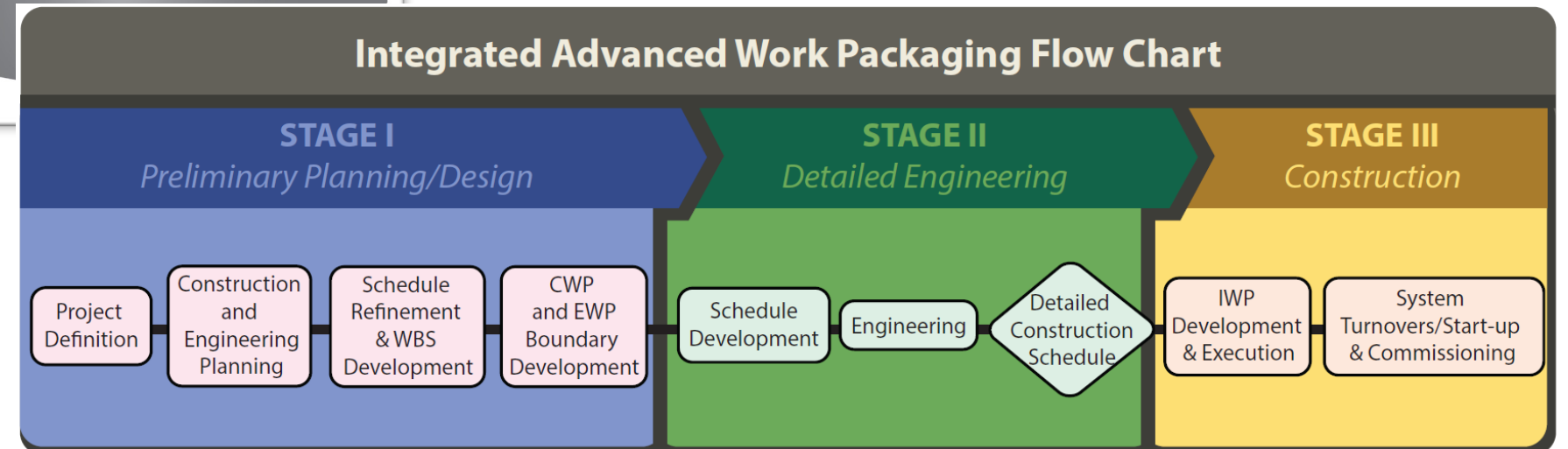
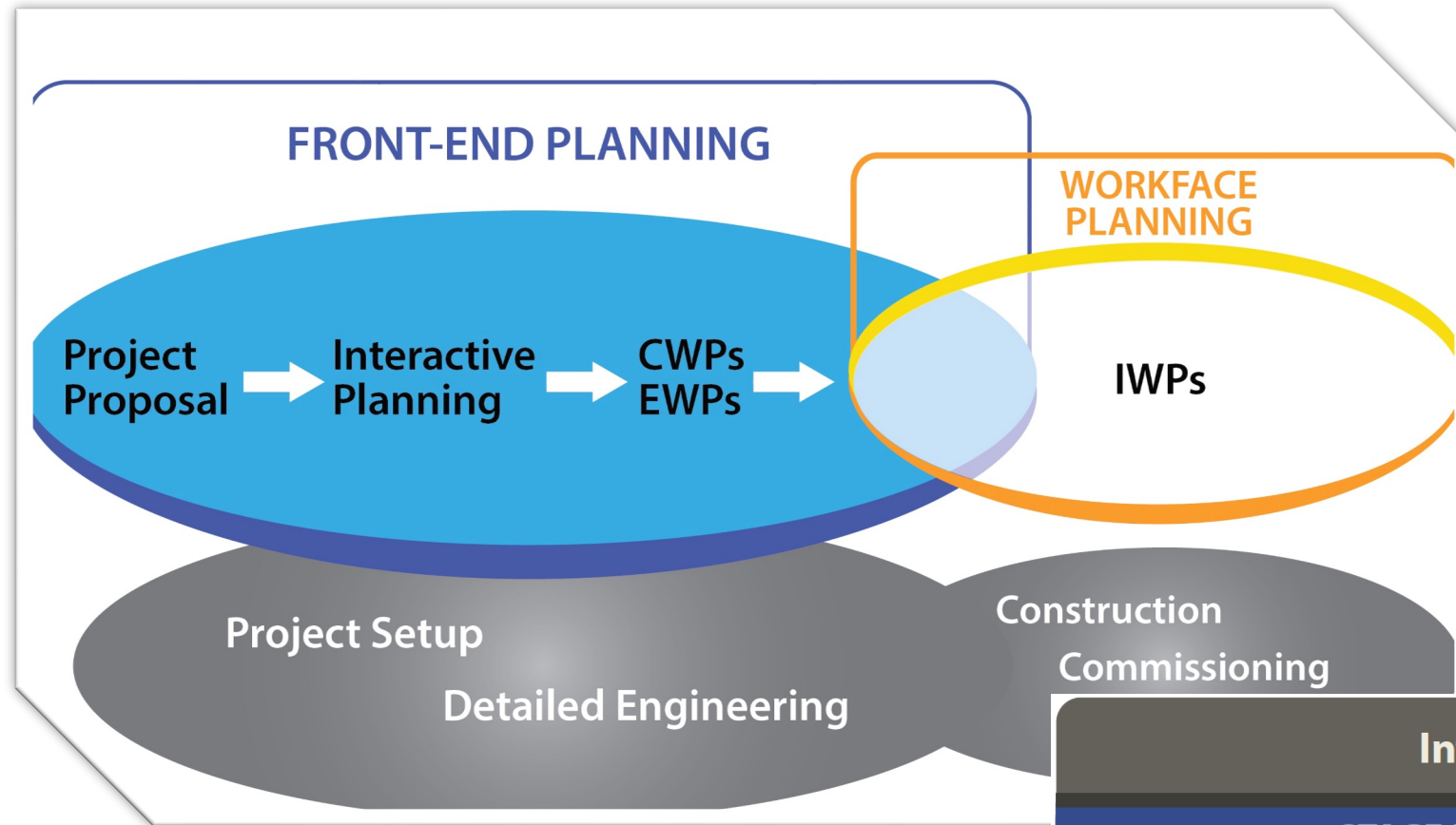
Data Driven Continual De-risking  
Instantaneous Visibility, Granularity & Audit Trail

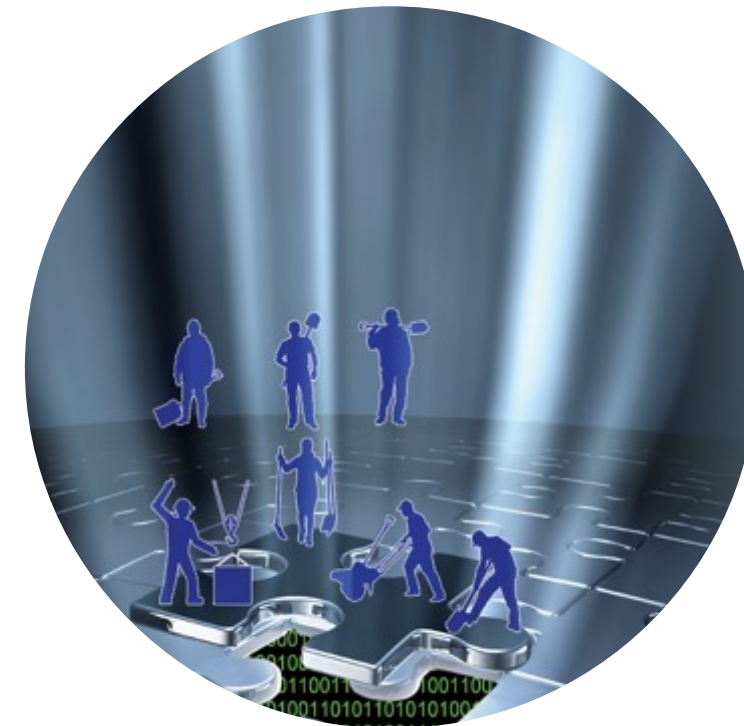
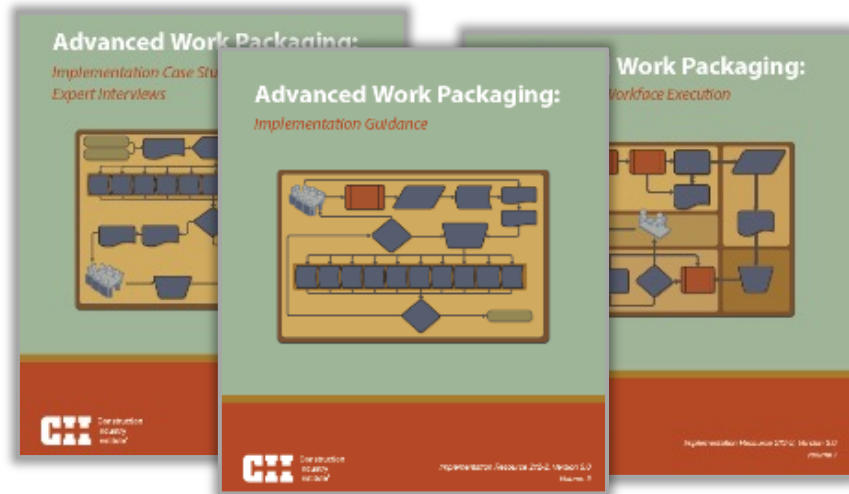




# The Method Improvement

# Advanced Work Packaging (CII-COAA)





# Advanced Work Packaging: Published 2013; Global Best Practice 2015

# Continual De-risking

- Instantaneous visibility to issues of Design, Material, Resources, & Manpower
- Weekly level execution fidelity
- Readiness to meet the Milestones



# Kanban Material Pull



3

While building the plan

Ensure plan is buildable

2

Material follow up team

Impact of changes in sequence

1

Point of Installation

Avoid 'anxious' moments/  
reduce error

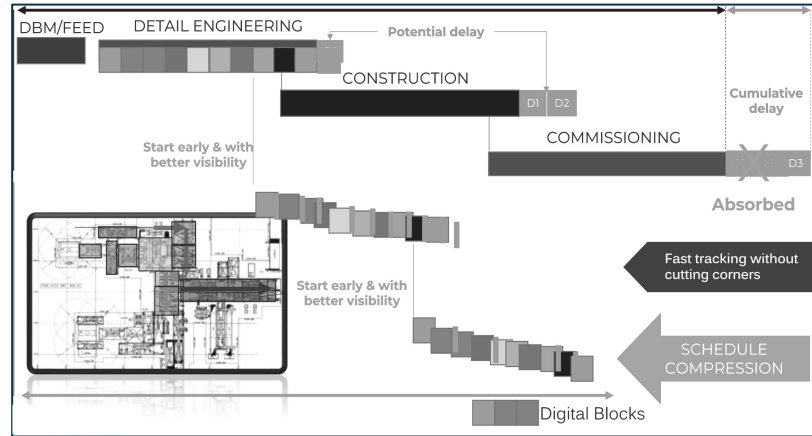




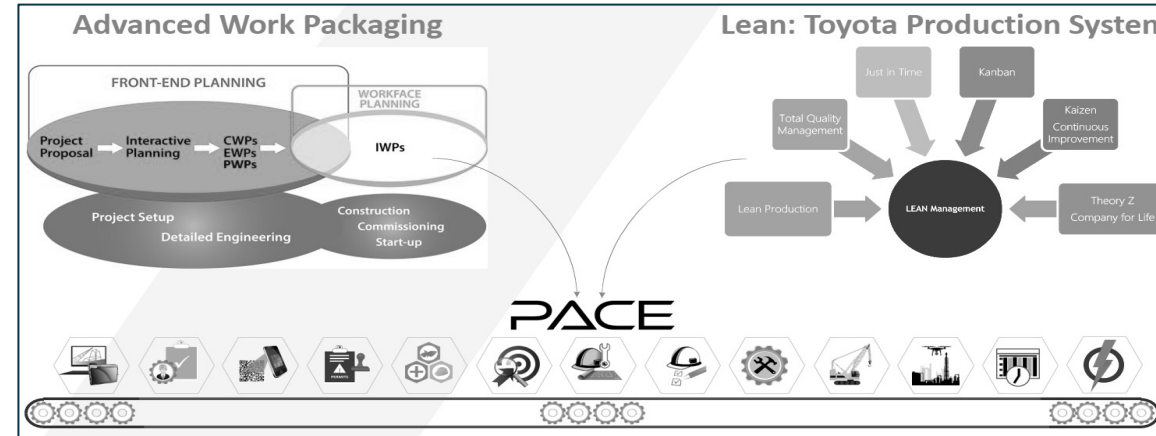
# Machine Augmented Project Intelligence



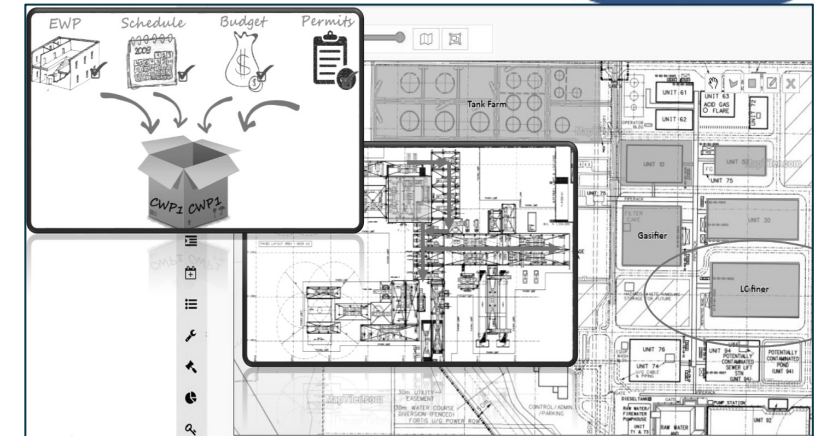
Ensures risk-free work fronts and schedule compression



Embedded AWP and Lean Framework



Unifies and sequences all data logically



GeoPlot Radar: Visualize your deliverables  
One window to all your data & deficiencies

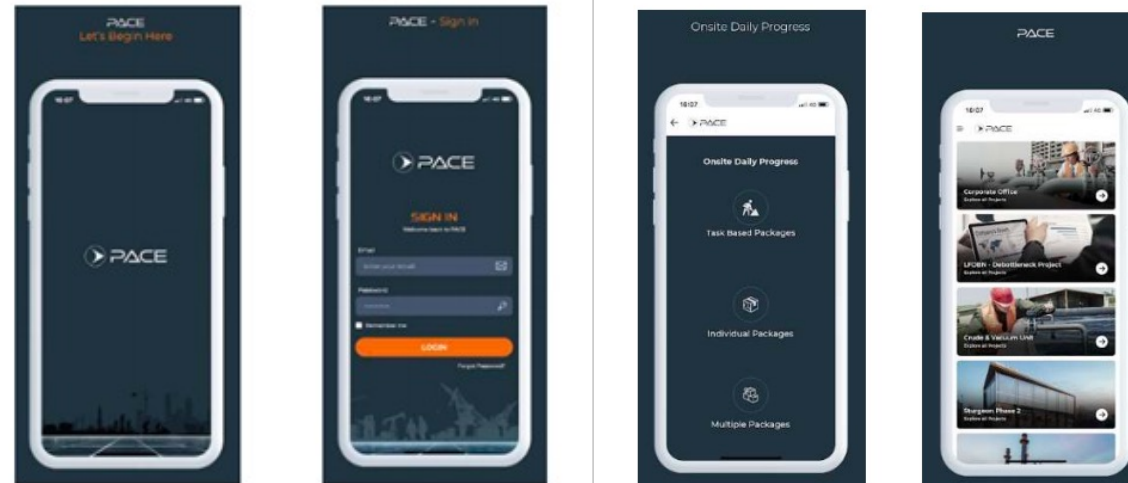
- Issues and Concerns Heat Maps
- Work Packages
- Area Key Plan
- Unit Plot Plan
- Plot Plan
- Satellite views
- Map

Integrated layers from:

GIS basis gets you ahead of 3D for Big or Small projects

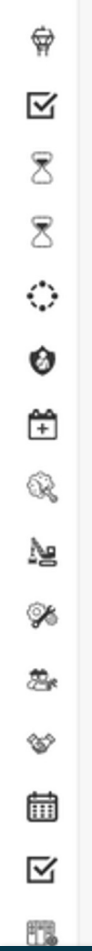
Intelligent Design Areas Aligned with Construction Work Areas in GIS. Visualize your project WBS and receive hinderance alerts.

Digital precision and transparency up to the front line throughout project lifecycle





# Projects at a Vantage: Transformation by Transition



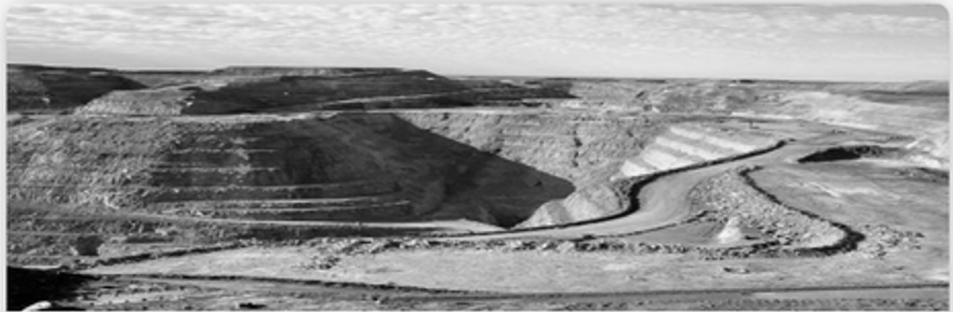
LNG Plant 📍 🔑

- + CT & Utilities
- + CLU
- + Marine
- + Brownfield Work



Birmingham Motorway Project 📍 🔑

- + Stretch-1 40 Miles
- + Stretch-2 50Miles
- + Stretch-3 50Miles
- + Stretch-4 30 Miles



Iron Mining Project 📍 🔑

- + Ore Handling Facility
- + Surface Infrastructure
- + UG Permanent facilities
- + Temporary office complex



Metro Rail Project 📍 🔑



The Goldwater Project 📍 🔑



West Midlands Retrofit Housing 📍 🔑

# Every Project Delivered Successfully



Empire Offshore Equinor Wind Project 📍 🔑



Solar Powered Water ATMs 📍 🔑



KEP1-BF VAR 3 Project (Sicim) 📍 🔑

# Digital Control Tower



## Digital Control Tower™

 **Deliver on Time**

 **Reduce Costs**

 **Enhance Safety**

 **Build Sustainably**



CT-New Complete Train ▶ New Complete Train\_A01

EWP: With Hold (Orange), Without Hold (Green), Delay (Red), Open (Grey)  
CWP: Delayed (Red Triangle), Slow/Hold (Orange Triangle), On Schedule (Blue Triangle), Not Started (Grey Triangle)





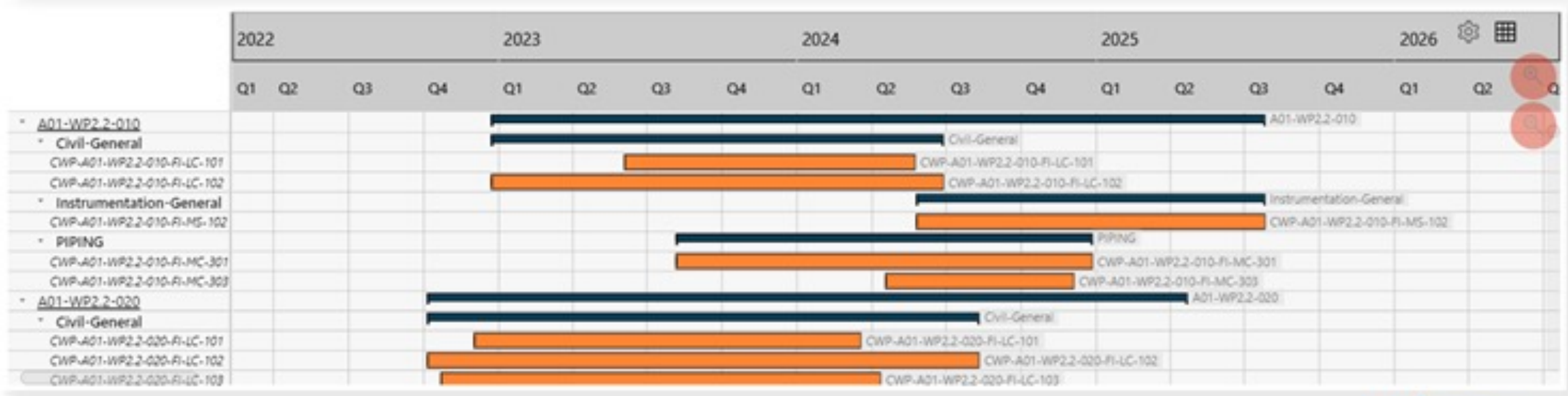
Area  
All

Discipline Name  
All

# Schedule Prediction

PACE OS

Schedule Scenarios



**Project Controls**  
**EXPO**  
Washington, DC - USA

UPTO

**20%**

INCREASED PRODUCTIVITY

UPTO

**100%**

ON SCHEDULE EXECUTION

UPTO

**10%**

REDUCED OVERALL PROJECT COSTS



# Nicola - Testimonial

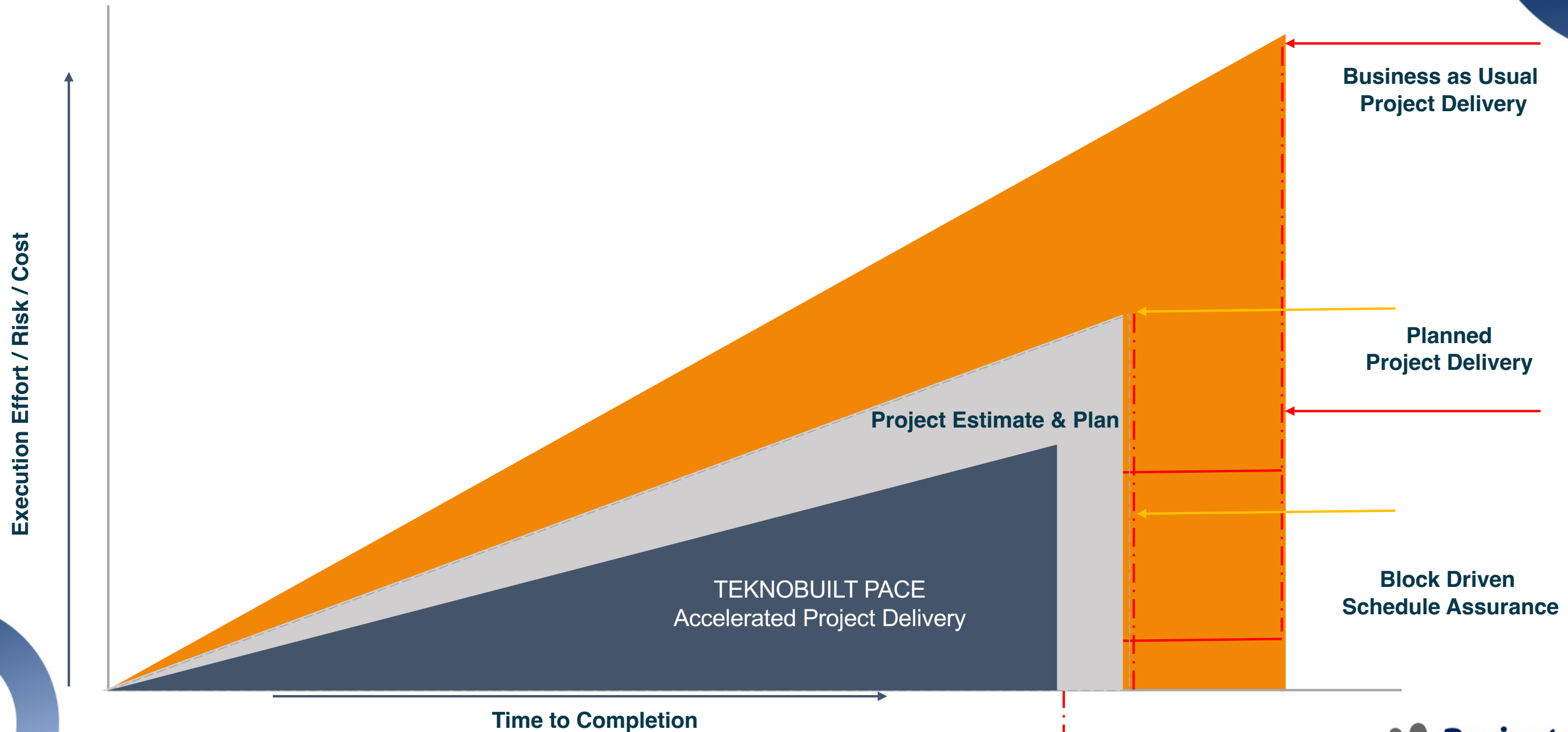


The outcome of these efforts held during the initial project phases combined with the workflow automation (including material tracking) is expected to **reduce by 10% the expected man hours** for Engineering preparation, compilation, and approvals. Thanks to the collaborative nature of the platform, the JV experienced easy coordination of **teams located all over the world (Italy, Korea, and Nigeria)** and clearer and more accurate insight of the project progress. The automated integration with existing tools (**15 tools operating in silos have been connected to the PACE OS through API**) has been particularly appreciated as it allowed deep insight, granular visibility and constant consistency of data, without any disruption of the business-as-usual processes, with no switching costs and less resistance from people in adopting the new processes, making the journey to improvement easy and smooth.





# De-risking Execution and Accelerated Project Delivery





The Sum is Greater than the Parts

# PACE: A Unified Digital Platform



The Sum is greater than the Parts

Instantaneous visibility & granularity  
Digital Construction Block™ driven end-to-end connectivity

Digital Control Tower

Project Planning & Estimation

Engineering Design & Data Management

Intelligent Supply Chain

Project Scope & Geo Plot Manager

PACE OS: Digital Block-driven Operating System

Kanban Cost & Carbon Manager

Fabrication

Construction & Completion

Quality

HSE

Mobility

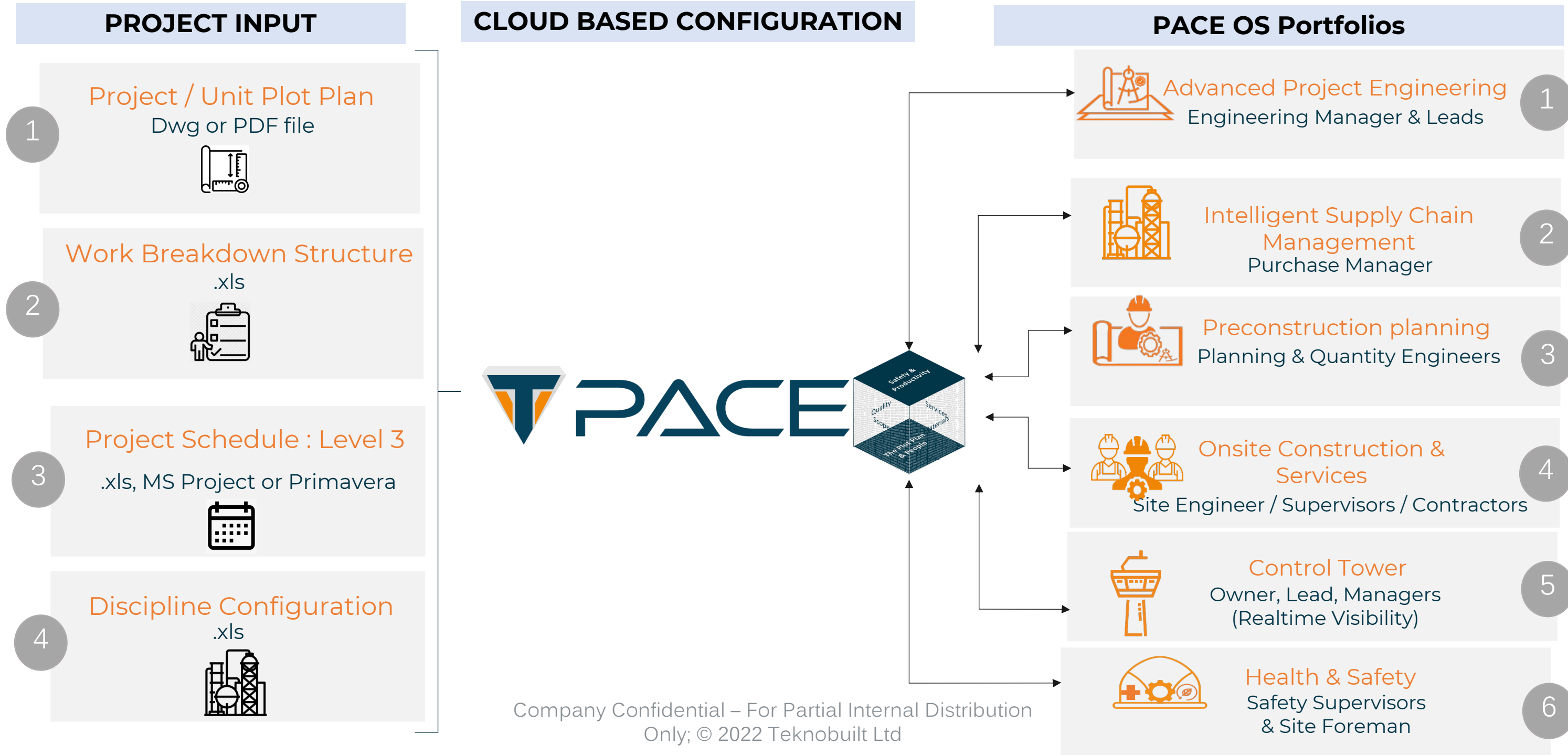
Drones

IoT

Satellite




AI/ML

# PACE- OS Start-up



# PACE iPlanet

## Carbon Tracking

-  Vehicles
-  Materials
-  Equipment

## Processing

  
Artificial Intelligence

## Intelligence

-  Predictive Analytics
-  Alerts
-  Insights



Governance



Strategy



Risk Management



Metrics & Targets



Transforming Environment & Sustainability



# Summary

# Block Driven Project Delivery Summary



1. Focus on **execution discipline & control** optimizing the **end-to-end** project delivery journey with a holistic approach
2. Obtain the most **value by aggregating incremental gains** in various stages
3. Digitalization along with **improved process & decision making** through embedded Digital AWP & Lean management system in digital platform
4. Critical tools to help managers **accelerate execution** and incentivise high performing teams
5. Digital-enabled transparency **instantaneous visibility and granularity**
6. Help become more agile and **quickly adapt to evolving digitally** with a capability building culture
7. **Digital transformation through transition** without the pain of disruption





# Ready to Transform Your Project Journey?

