

Rethinking Digital Engineering

How SAP and Siemens are working together to revolutionise Capital Projects and Engineering Management

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Jon Wilson Global Centre of Excellence – Digital Supply Chain **SAP**

14 Nov 2023

PUBLIC



SAP acknowledges the First Peoples – the Traditional Owners of the lands on which we gather, the Kombumerri and Yugambeh.

We recognise their continuing connection to land, water and community. As an organisation, we pay respect to their Elders past, present and emerging.

What will we cover?

- Understand the Siemens partnership and SAP solutions in the context of Capital Projects and Digital Engineering
- Demonstration of the SAP Capital Projects and Engineering Management (CaPEM) solution
- Use cases and benefits of Digital Engineering with SAP



2,963.4B

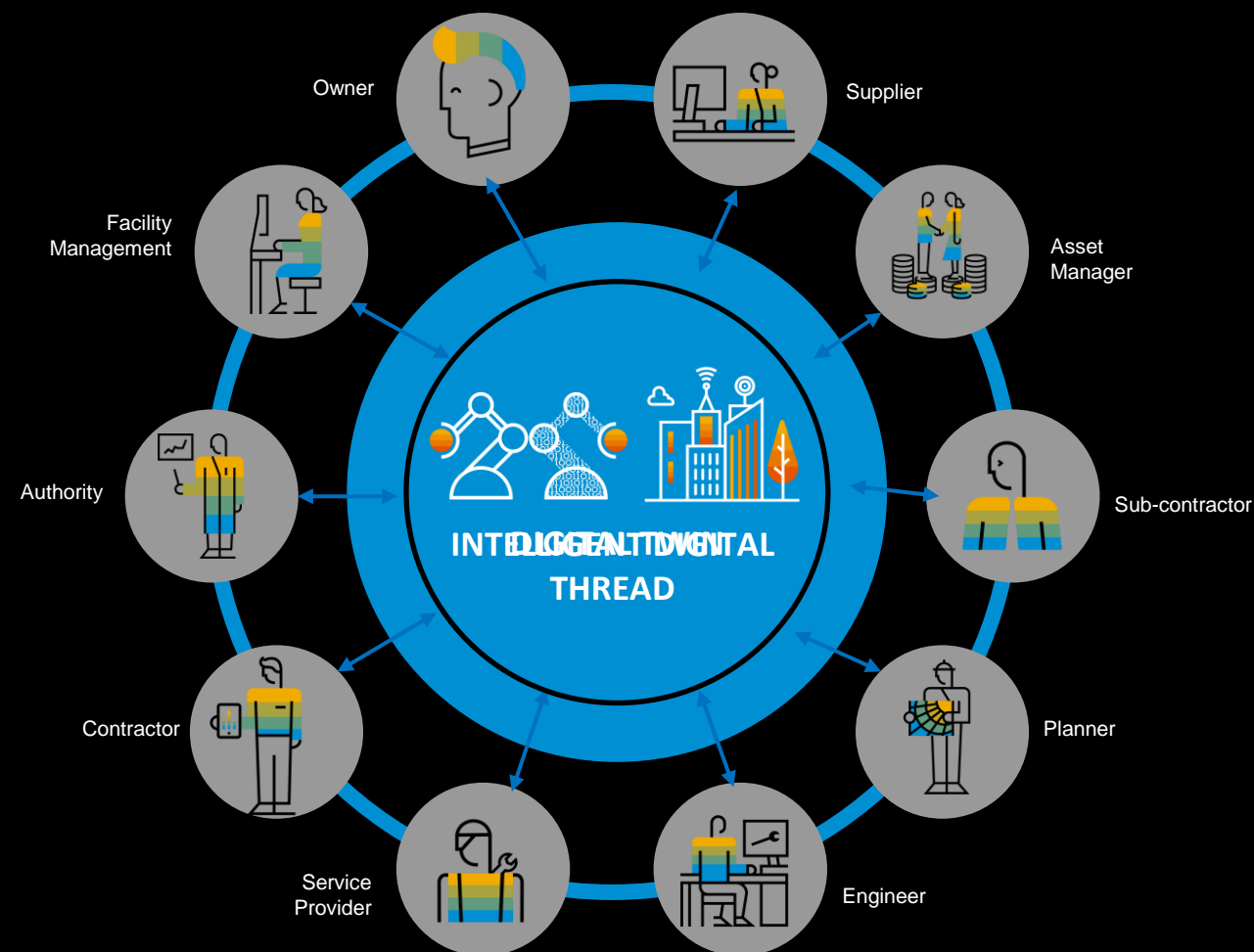
Total Government Assets (AUD)
[Australian Bureau of Statistics](#)

A blue geometric shape, resembling a stylized arrow or a parallelogram with a diagonal cut, pointing towards the right. It contains the text '237.0B' in white.

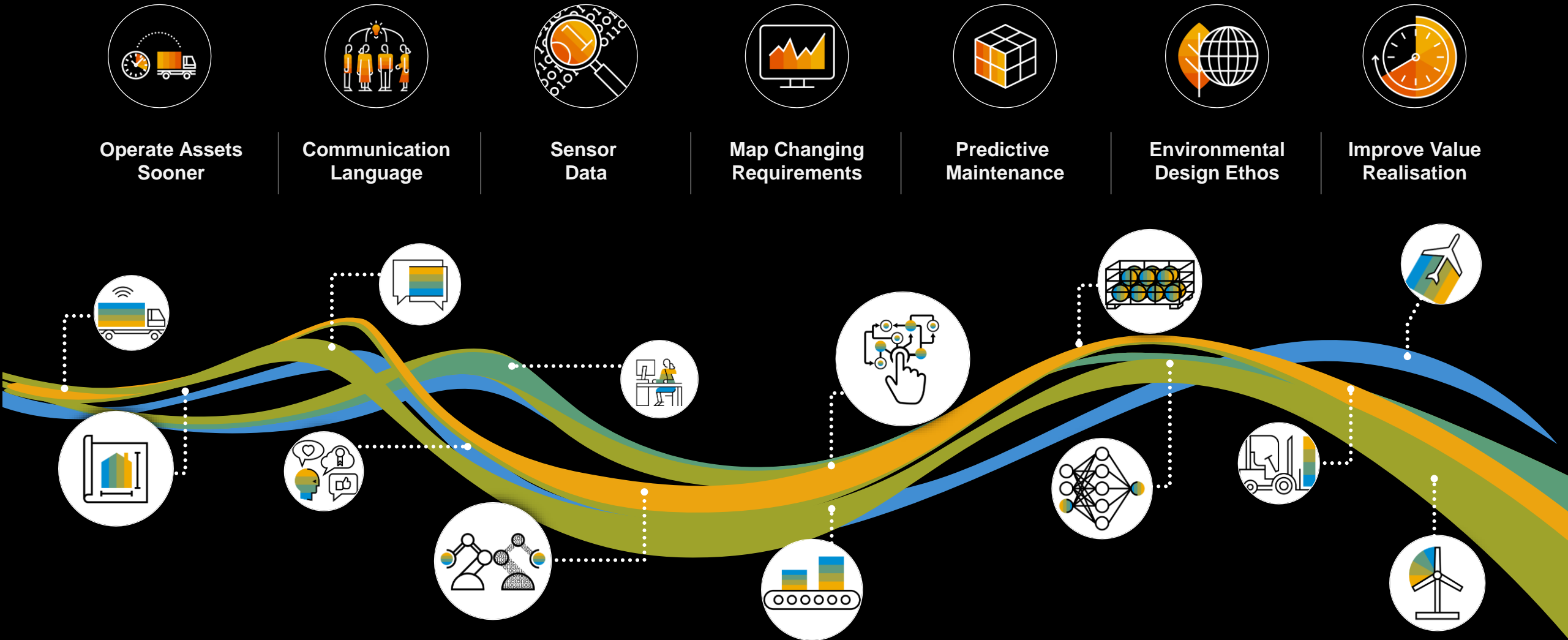
237.0B

5 Year Infrastructure
Pipeline (AUD)
[Infrastructure Australia](#)

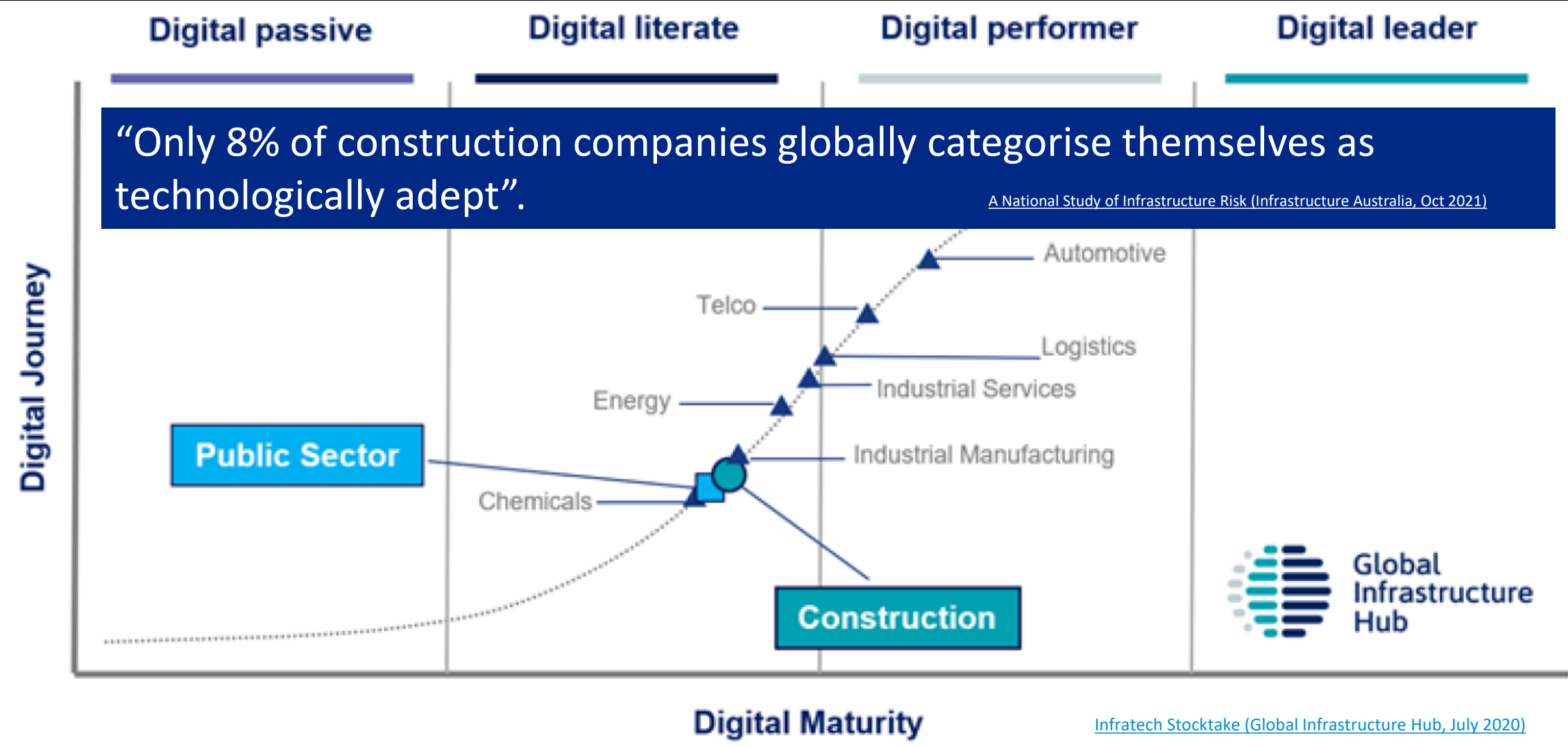
The complexity of large construction and renewal projects



Intelligent Digital Thread



Lagging Digital Maturity



“If we could halve the gap in productivity growth between the construction industry and other industries over the past 30 years, we co

ir.”

[Jon Davies, Australian Constructors Association Nov 2021](#)

Asset Intensive Industries

Capital Projects and Assets

Capital Projects

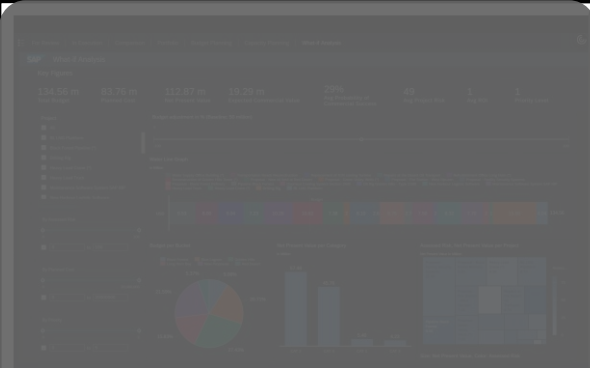
- Large and long term projects
- Asset intensive industries (Utilities, Oil & Gas, Chemicals, Nuclear)
- The need to invest into new production facilities
- Project break-even after many years/decades

Capital Assets

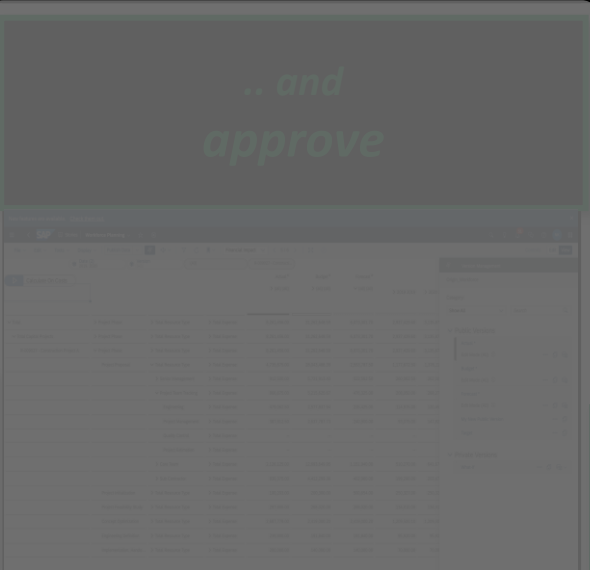
- Physical installations/items with long life, often +10 years in operations.
- Examples of capital assets include power plants, oil rigs, refineries, etc.
- A capital asset is the end result of the capital project.



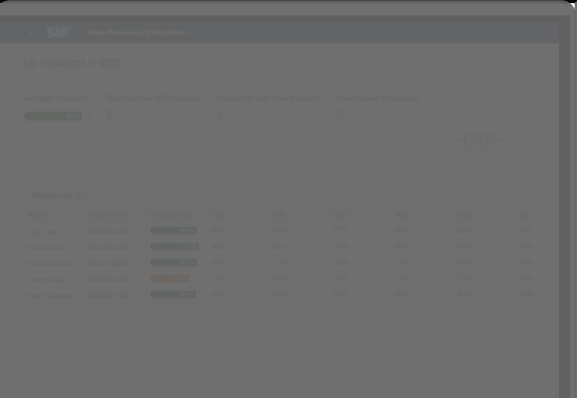
Collaborative Portfolio and Project Management with an Intelligent Digital Thread



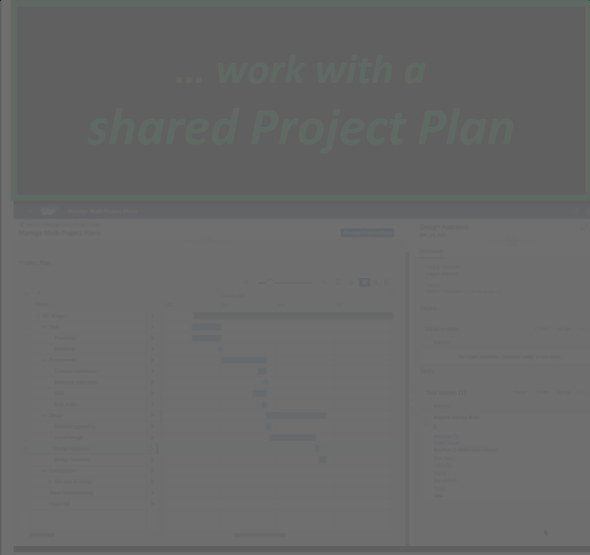
Prioritise projects



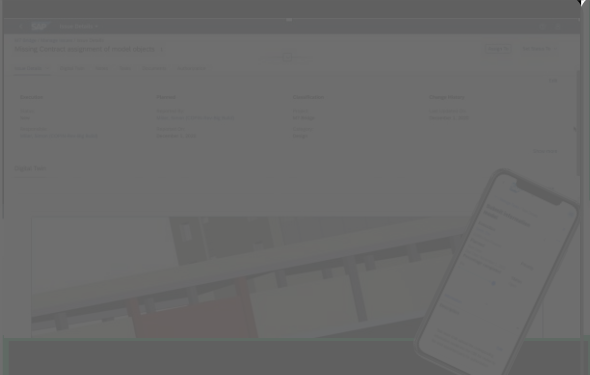
.. and approve



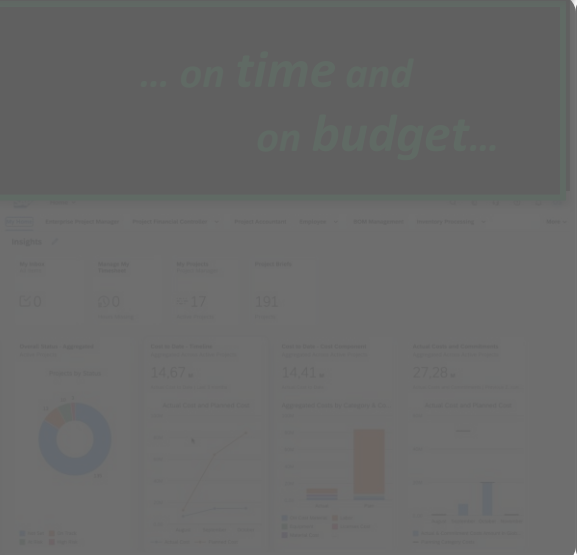
... toward optimal Resource Allocation.



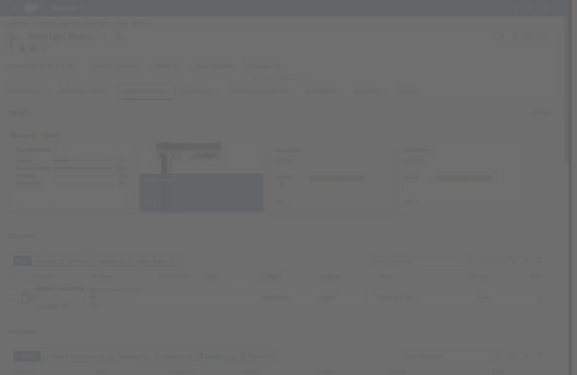
... work with a shared Project Plan



... and focus on deliverable relevant Tasks...

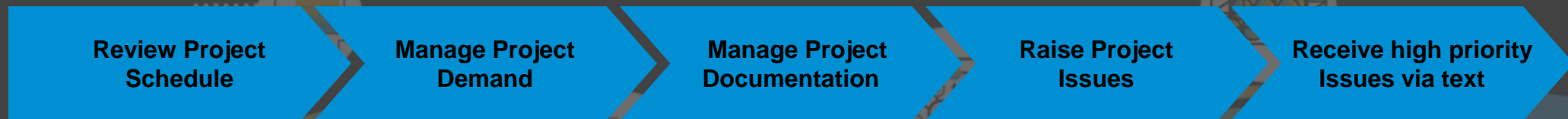


... on time and on budget...



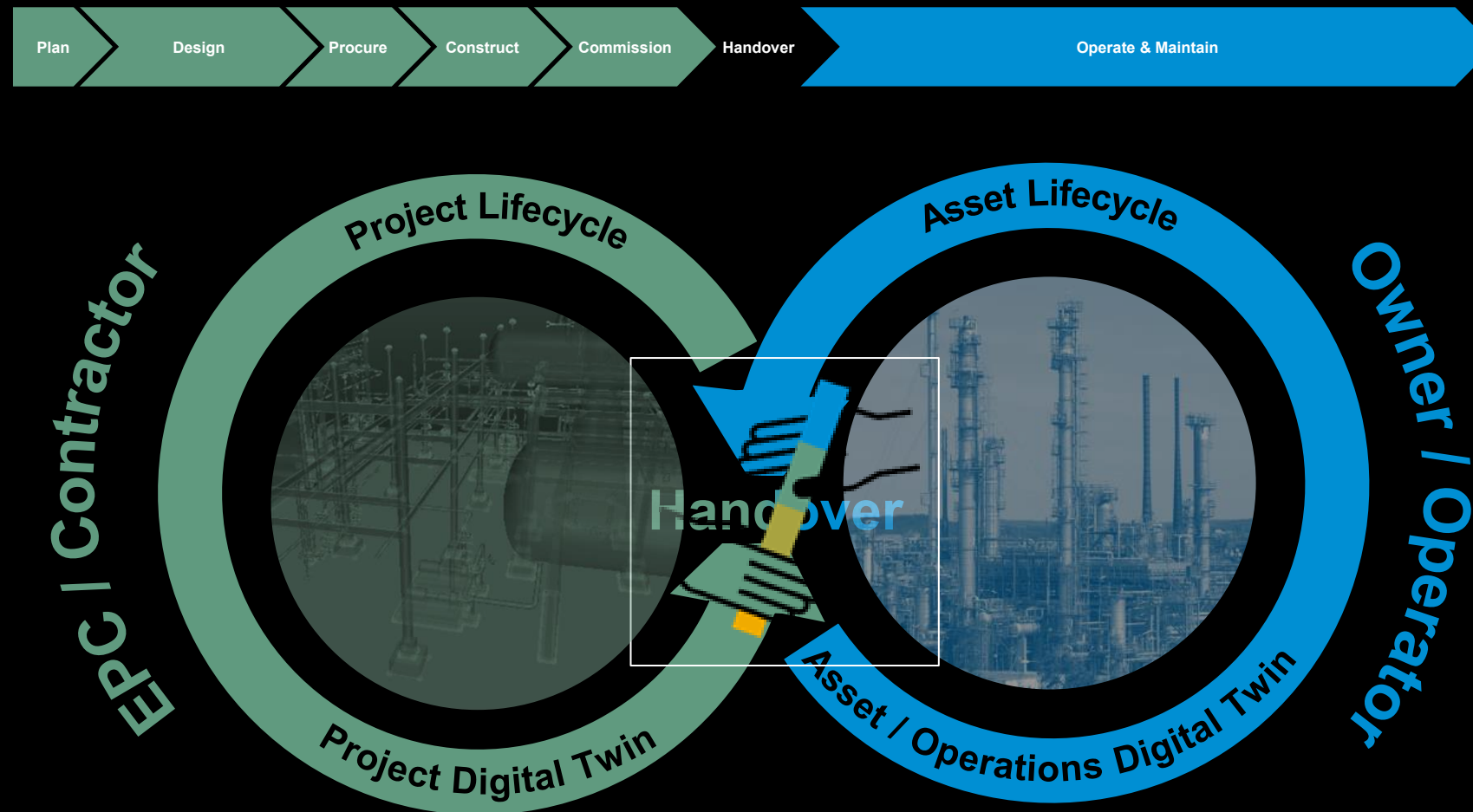
... with smooth Handover to Operations.

Project, Portfolio and Construction Management



Project and Asset Lifecycles

Handover Challenges



Owner/Operator Asset Data Challenges

Data silos



No single company has complete end-to-end lifecycle view of an asset, from the engineering and project phase to operations and maintenance

Data sharing



Missing shared collaboration space with contractors/EPCs to share and acquire project and asset data.

Data standardisation



Lack of consistent asset definition structure (data model) to simplify data sharing with EPCs

Data handover



Slow, manual and document-based handover process of asset data

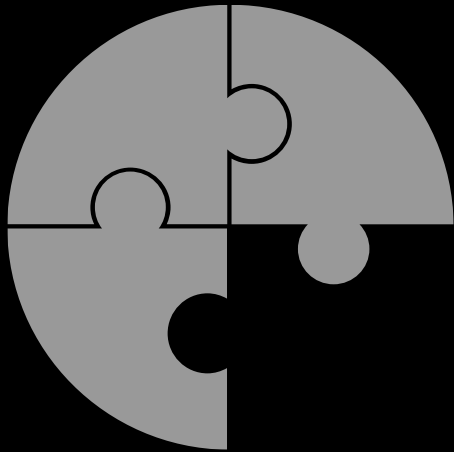
Data quality



Error prone processes for extracting, transforming, validating, and loading data into multiple systems.

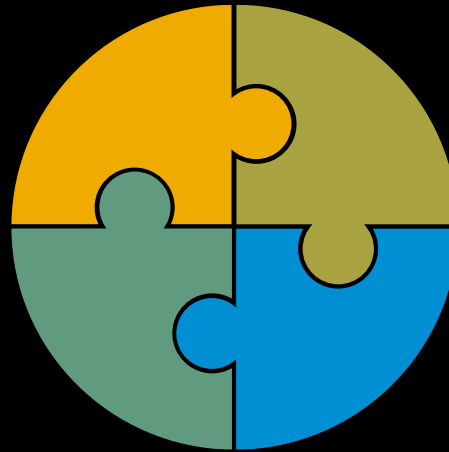
The missing puzzle – IT systems for Capital Projects

Plant Design and Engineering Data Management systems



Provides some data management and collaboration capabilities, but often limited to specific authoring system

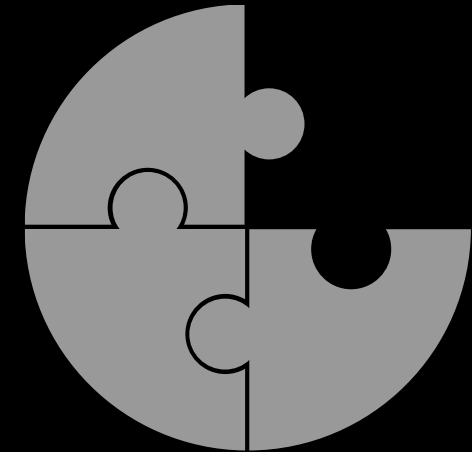
SAP Capital Project Engineering Management



Data acquisition, consolidation and mapping

- Plant design & engineering data import from third party systems
- Multi-CAD data management
- Data consolidation
- Data mapping
- Integration to enterprise systems

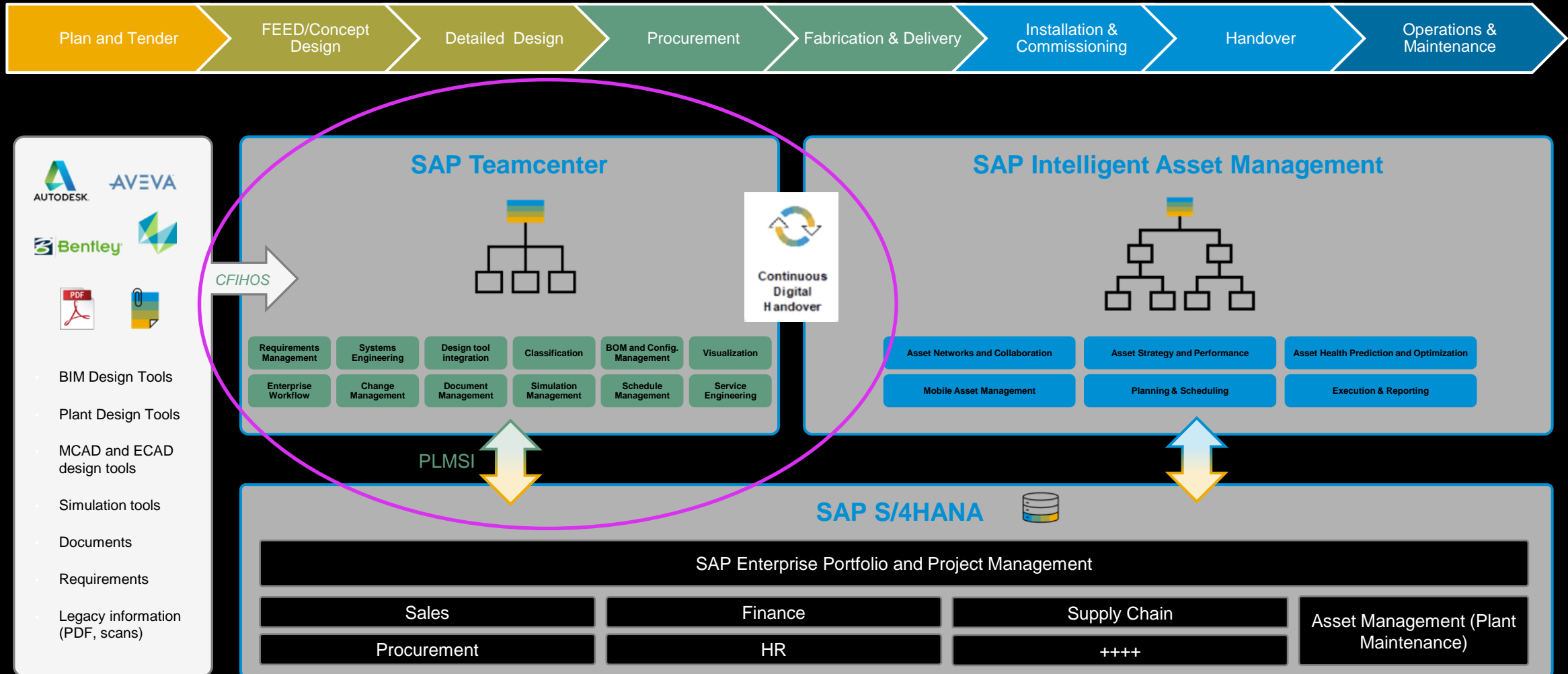
Enterprise Data Management systems



Provides data management and collaboration capabilities, but often document based and not linked to plant design data structures

SAP solutions

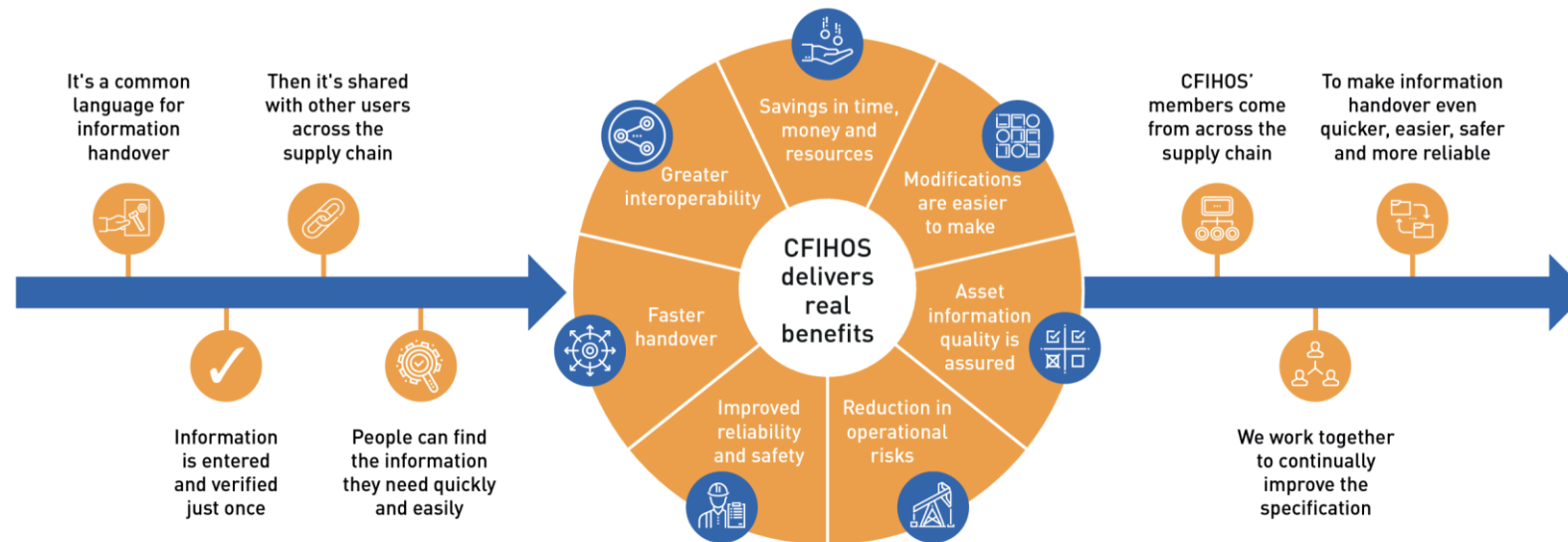
SAP CaPEM enables management of Plant Design and Engineering Information for Capital Assets



CFIHOS

Capital Facilities Information HandOver Specification

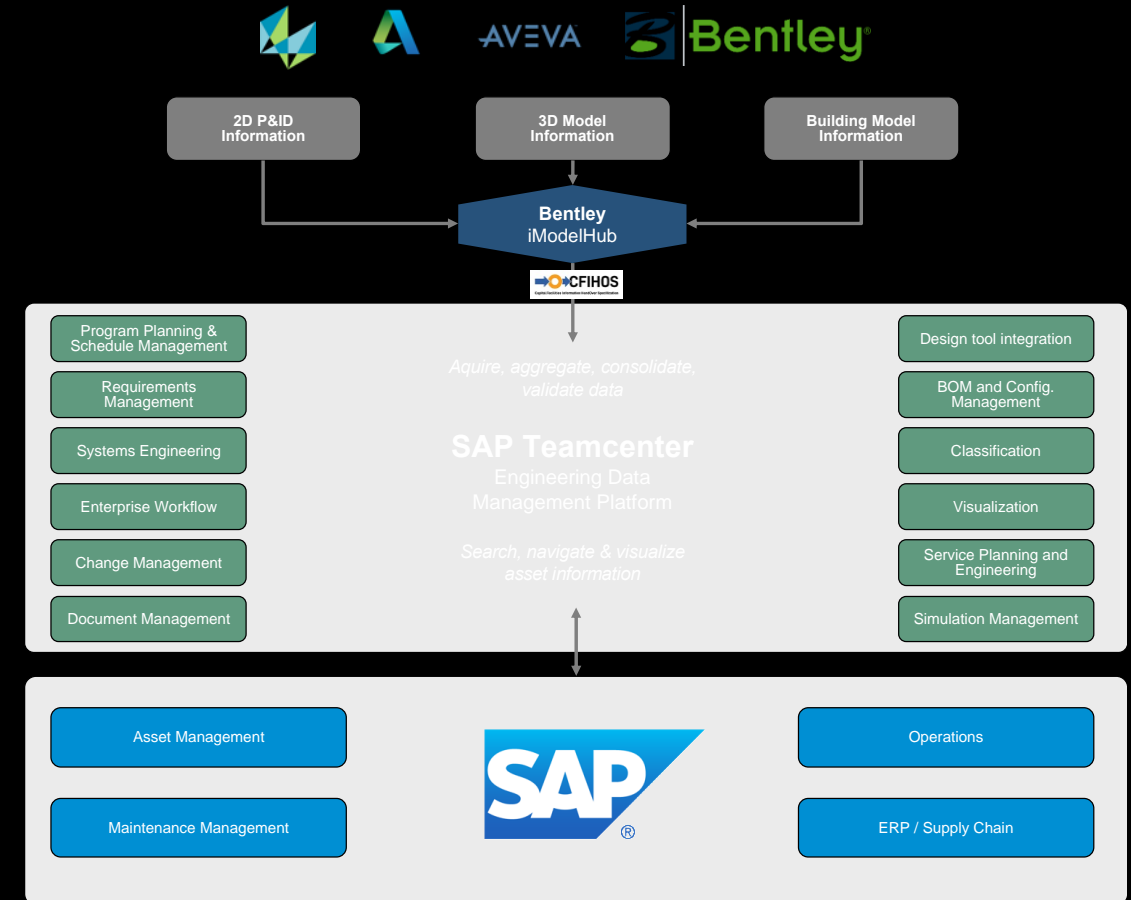
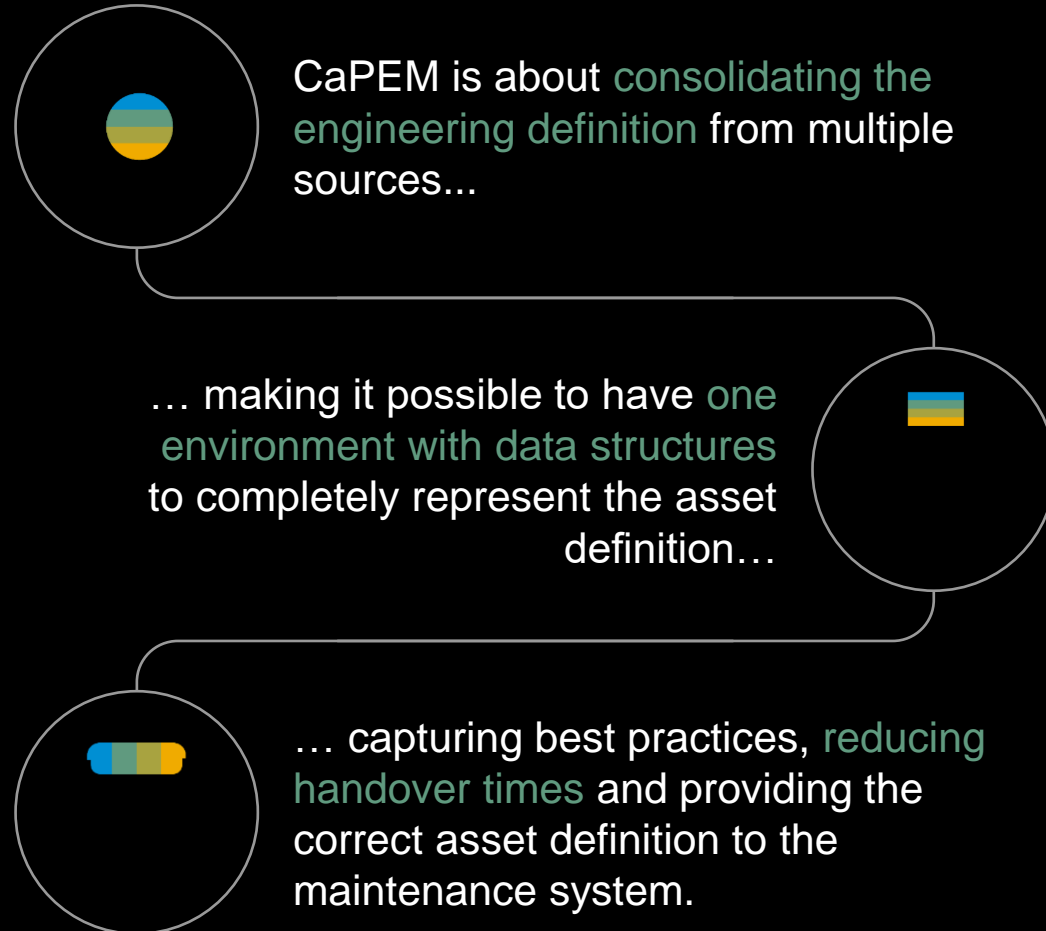
The CFIHOS specification can be used for information handover when commissioning, operating, maintaining or decommissioning any process industry capital facility.



The CFIHOS specification is freely available for anyone to download and use from www.cfihos.org. Get in touch and find out more about what we do.

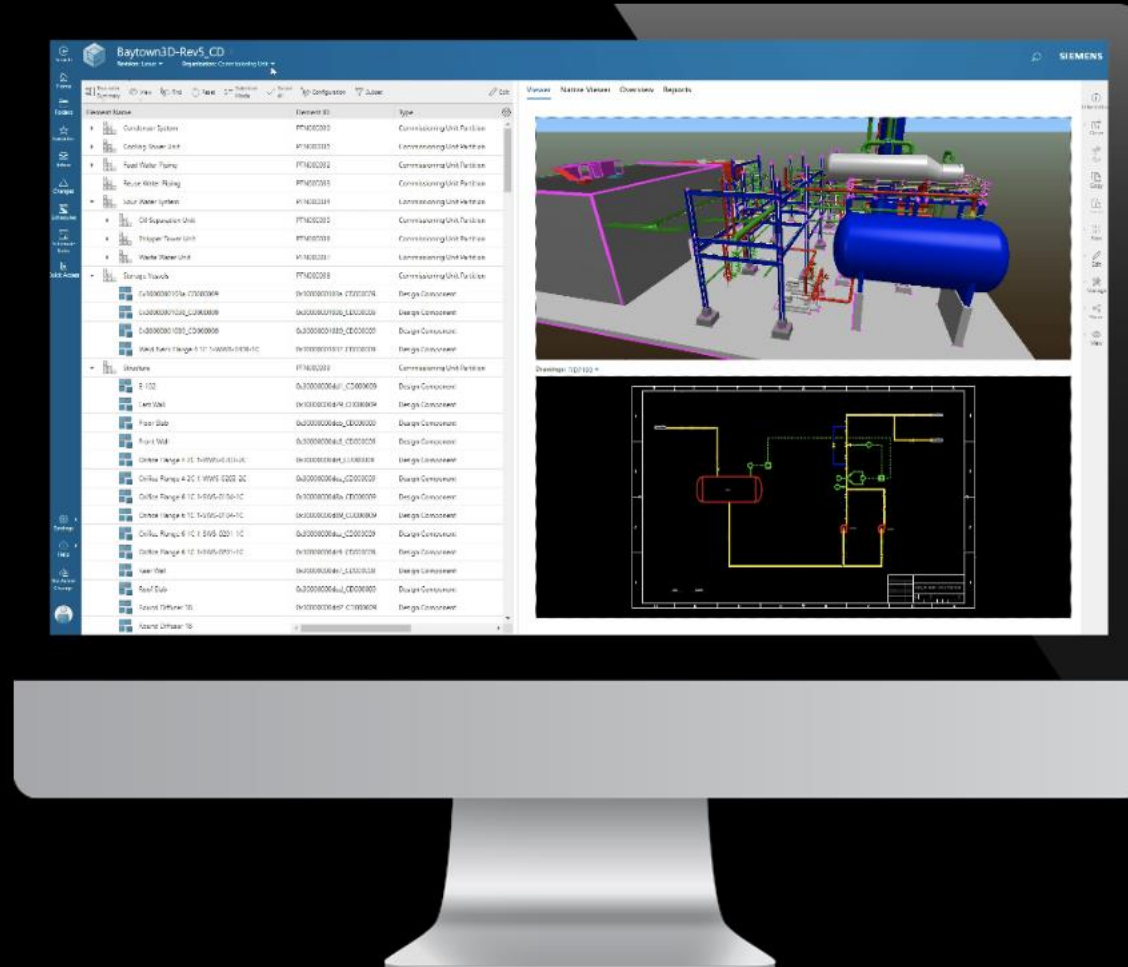
SAP Capital Project Engineering Management (CaPEM)

Management of Plant Design and Engineering Information for Capital Assets



SAP CaPEM

Solution Demonstration





ZN-Packaging

Revision: Global (Latest Working)

Date: Today

Units: All Units (013444/A:1-ZN-Packaging)

Variant: No Variant Rule (013444/A:1-ZN-Packaging)

Expansion: No Rule

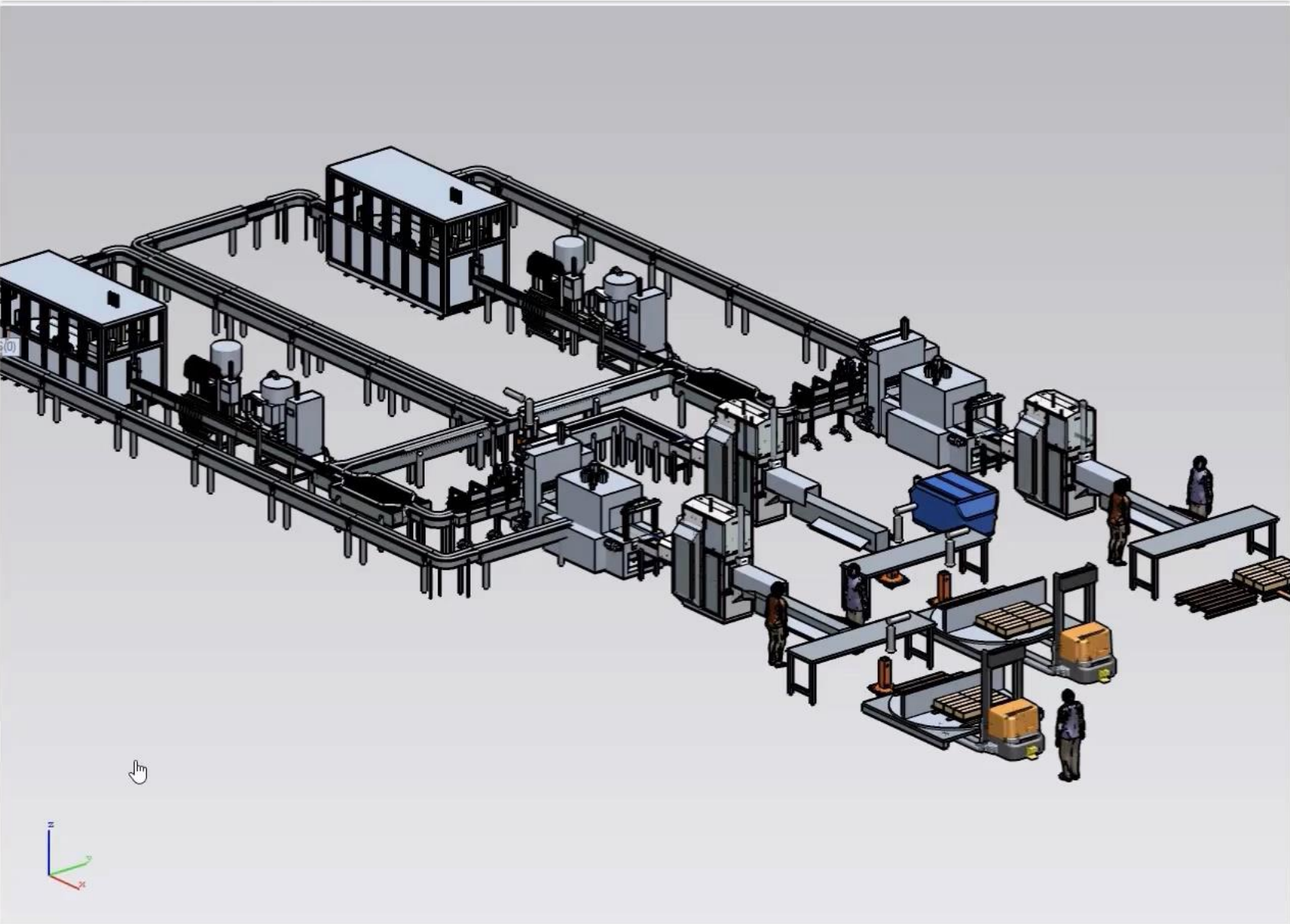
Owner: Paul (paul)

Date Modified: 08-Jun-2020

Release Status:

Type: MEZoneRevision

3D Overview Finishes Partner Contracts Made From Where Used Changes Attachments History Relations Collaboration Participants Simulation Reports



Element Name	Revision	ID
ZN-Packaging	A	013444
LN-PKG-Custom	A	000499
ST-Transport3	A	000516
ST-Wrapping3	A	000515
ST-SmartPacking1	A	000514
ST-Return2	A	011197
ST-Return1	A	011196
ST-CustomBuffer1	A	011201
ST-CustomBuffer2	A	011206
LN-PKG2	A	000497
ST-Packing2	A	000509
ST-Wrapping2	A	000513
ST-Printer2	A	000510
ST-Sealer2	A	000511
ST-Transport2	A	000512
ST-PackageCreator2	A	000508
ST-Filler2	A	003204
ST-Buffer2	A	004189
ST-Return2	A	011212
LN-PKG1	A	000498
ST-Wrapping1	A	000505
ST-PackageCreator1	A	000501
ST-Transport1	A	000506
ST-Sealer1	A	000502
ST-Printer1	A	000503
ST-Packing1	A	000504
ST-Filler1	A	003207
ST-Buffer1		

Business Network for Assets – (use case 1)

SAP Equipment ▾

LIGHTING / EXTERIOR_LIGHTING_EQUIPMENT / Street_Light01 /

Street Light, Modern

 BRL_01

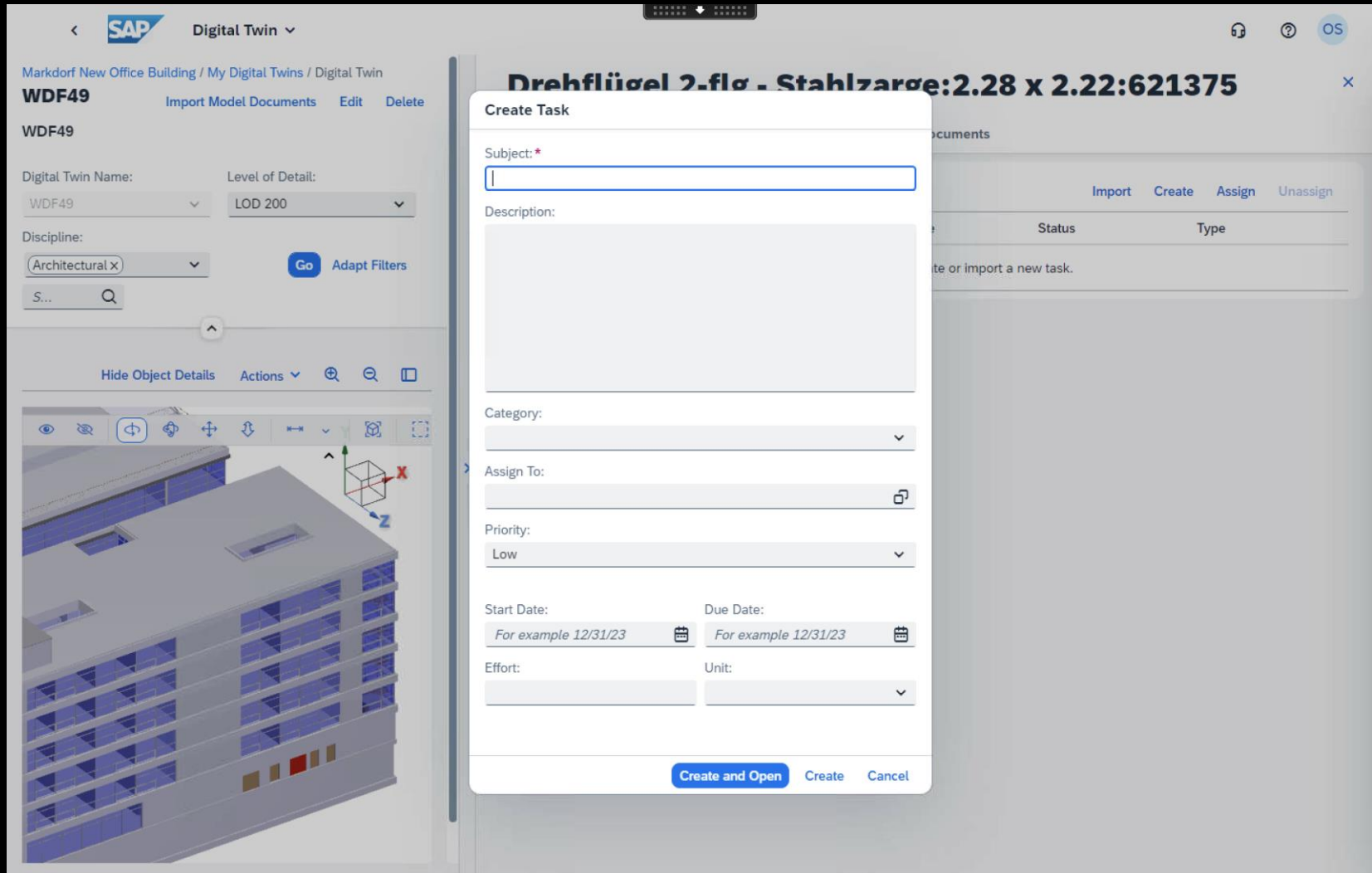
Safety Walks enabled by SAP Visualisation*) capability – (use case 2)



- SAP predictive maintenance capabilities *)
- SAP Visualisation capabilities *) can assist in proactively managing safety

*) additional license applies

Project collaboration – project – (use case 3)



*) additional license applies



90%

achieve 90% time
reduction in asset handovers

We help the world's most complex global construction companies to operate **smoothly and profitably**



Tomlinson efficiently running over **650 projects** concurrently and poised for **tremendous growth in Canada**, ready to take on more complex projects



"Innovation, safety and continuous improvement are the cornerstones of everything we do. It's part of the value that extends beyond the materials, talent, and timeline."
Matt Gramblicka, Vice President, IT and Enterprise Applications, Graham Construction



POWER INTERNATIONAL
- HOLDING -

Multiple **siloed** ERP systems across the group companies leading to **inconsistent data, lack of** master data governance & **operational visibility, delays in financial closing, slow decision making**, and no analytics. PIH needed an **integrated system** and S/4HANA with "**boxed**" LTI Industry Cloud solutions were **fit for purpose**, providing quick time to value.



"SAP was always by our side in the entire journey, providing us the required boost whenever required. The SAP team is determined to ensure that Shapoorji Pallonji achieves its desired business outcomes by effectively using SAP solutions." *Manoj Bhoota, Vice President IT, Shapoorji Pallonji Group*



By **integrating** high-quality data across critical enterprise applications, Clark now enjoys the efficiencies of making **data-driven decisions** that both contribute to **business growth** and keeping their **employees and workers safe**. And they did this during the heat of the pandemic.



"We are under pressure from every part of the business to introduce innovative technologies that will help improve operational efficiency. With SAP S/4HANA, we can now deploy these new solutions."
Vitor Martins, Corporate IT Manager, Mota-Engil SGPS SA

Customers in Construction Worldwide trust SAP to deliver **leading transformational platform** to achieve business outcomes

TOMLINSON
FOUNDED ON STRENGTH GUIDED BY VISION

stuartolson
people creating progress

AECON

GRAHAM

Day & Zimmermann
We do what we say.®

ZACHRY

EUROVIA

HATCH

CHIYODA

enerfab
EXCELLENCE THROUGH EXECUTION

FLUOR

LARSEN & TOUBRO

Turner

HCC

POWER INTERNATIONAL
HOLDING

bam

PRUKSA

MOTAENGIL

HOCHTIEF

BOUYGUES
The challenger spirit

STRABAG

ESSAR

BILFINGER

Shapoorji Pallonji

CLARK
CONSTRUCTION

VILLARA
BUILDING SYSTEMS

Abantia

TopHat

BROADSPECTRUM

alfanar

"To be the best, you need to know where you stand on project quantities and costs on a daily basis. SAP software provides the foundation and capabilities for accurate, real-time knowledge and growth."

- Ranjeet Gadhoke, Senior Project Control Director, Zachry Construction Corporation

Thank you.



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