

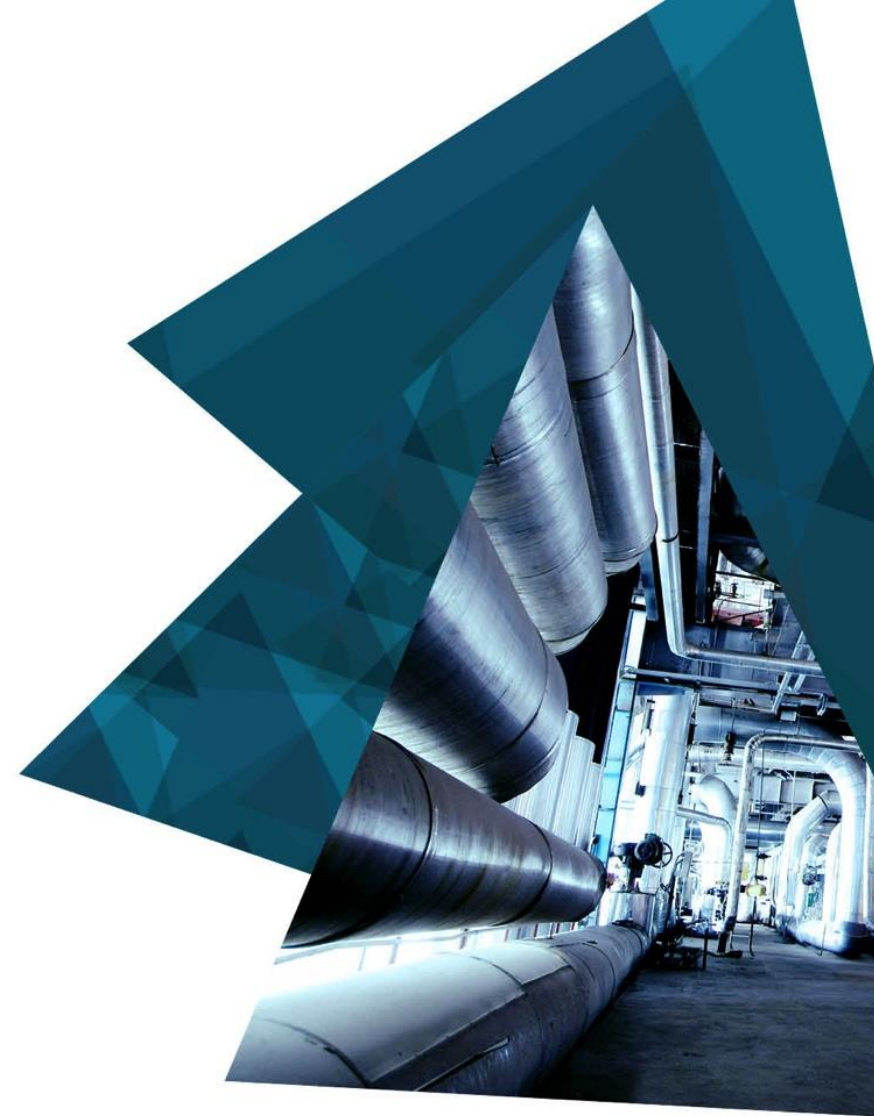


The role of the Smart Digital Asset in optimizing offshore operations efficiency, safety and predictability

Adrian Park, Vice President, Information Management

AGENDA

- A brief introduction to Hexagon
- Digital Twin/Smart Digital Asset
- Providing interoperability and example Integration with SAP PM?
- Capturing the Brownfield Digital Twin
- Handover Challenges
- What is the CFIHOS standard?



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A brief introduction to Hexagon

Hexagon at a glance



Technology Solutions Provider

- Established leader in **information technologies**
- Solutions drive **productivity** and **quality** improvements



Global Reach

- Broad range of vital industries served
- More than **18,000** employees in **50** countries



R&D Focused

- **10-12%** of net sales invested in R&D
- **3,400+** employees in R&D
- **3,200+** active patents



Strong Financials

- **3.1 bn EUR** in sales
- **23.4% operating** margin



Hexagon's primary divisions

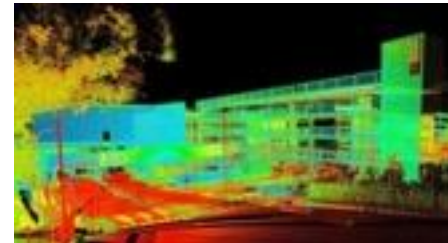
Our divisions serve three primary landscapes – manufacturing, engineering and geospatial. Each is committed to pioneering innovations in business processes, value chains and information exchange.



PROCESS, POWER & MARINE



GEOSPATIAL



GEOSYSTEMS



MANUFACTURING INTELLIGENCE



MINING



POSITIONING INTELLIGENCE

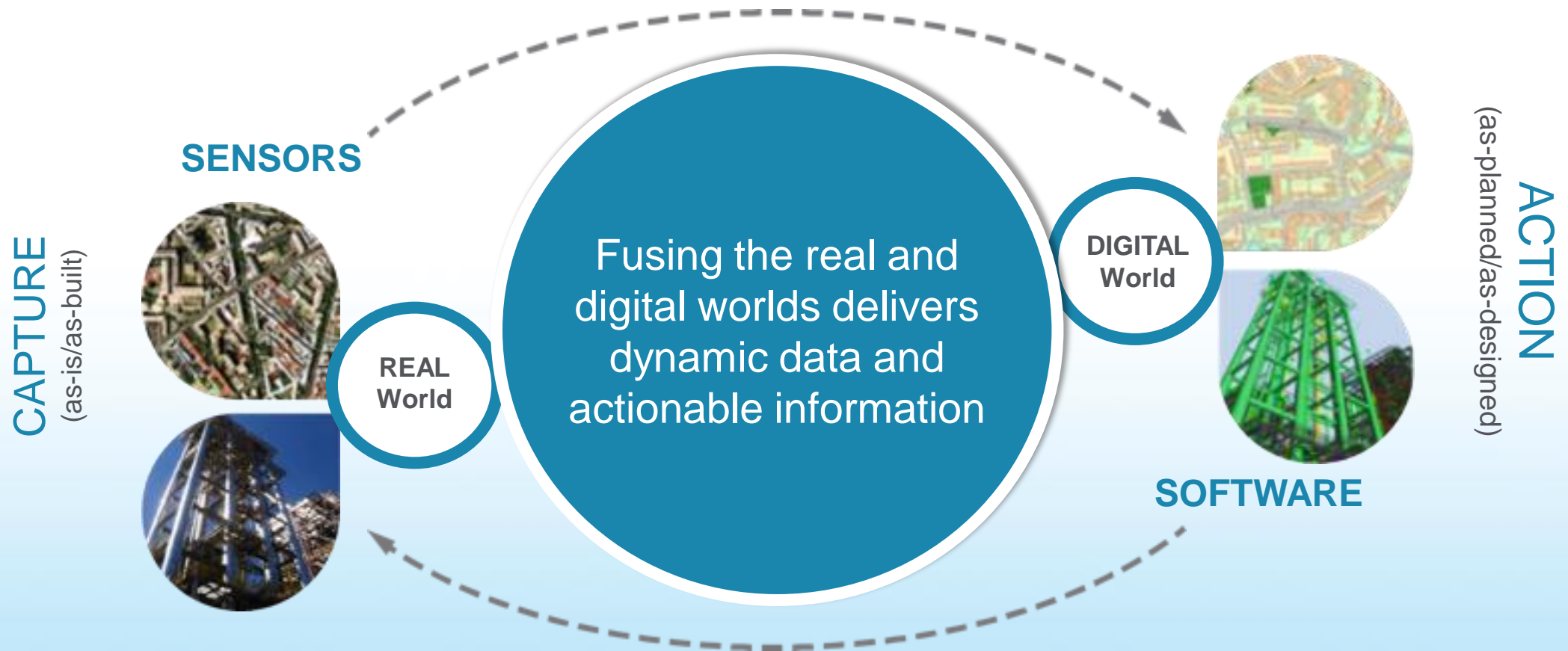


AGRICULTURE

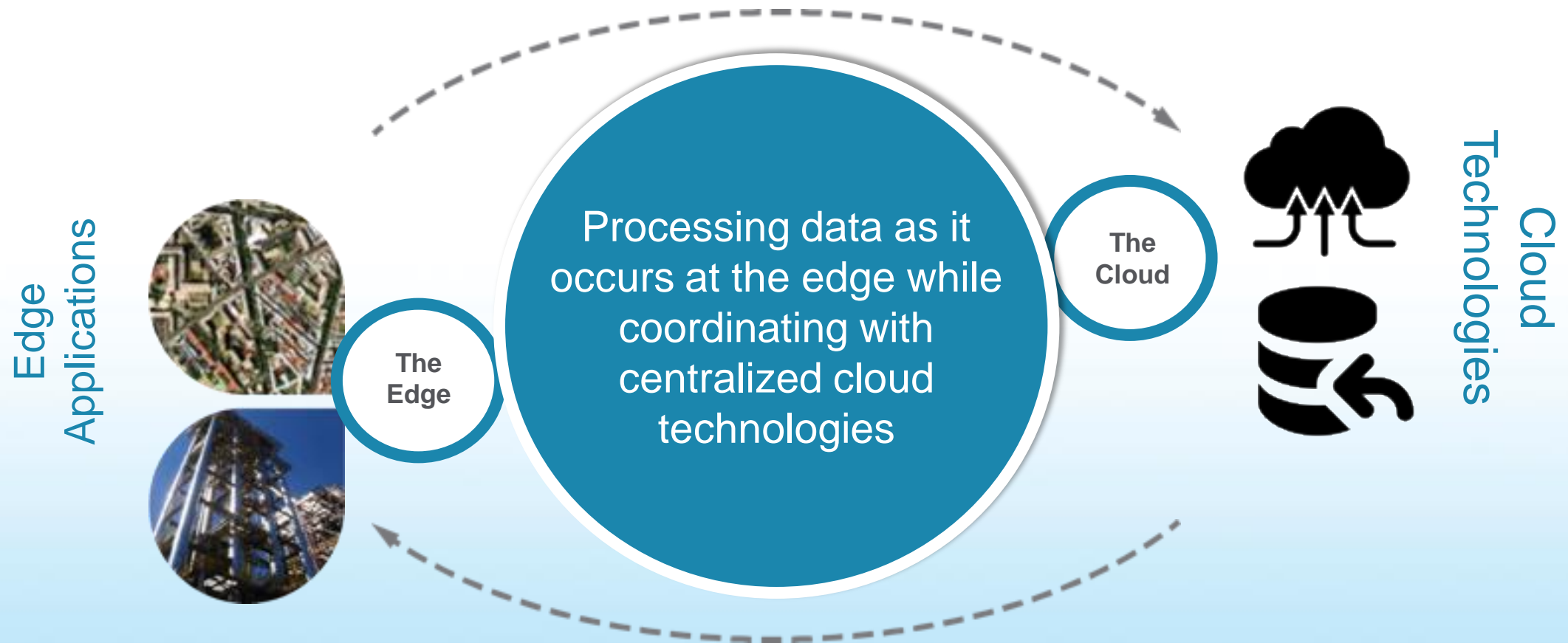


SAFETY & INFRASTRUCTURE

Fusing the real and digital worlds



Building a bridge from the edge to the cloud



A large, abstract geometric pattern composed of various shades of blue triangles and polygons, located on the left side of the slide.

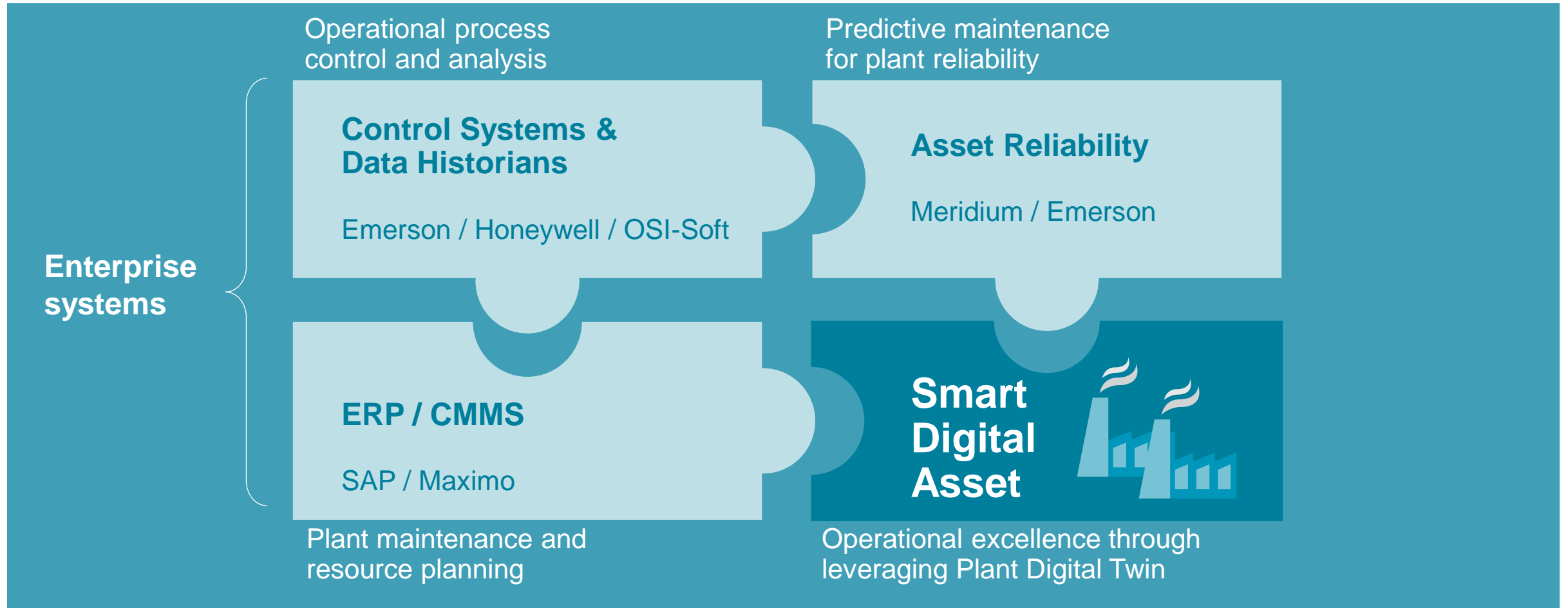
Digital Twin/Smart Digital Asset

Smart Digital Asset – Digital Twin

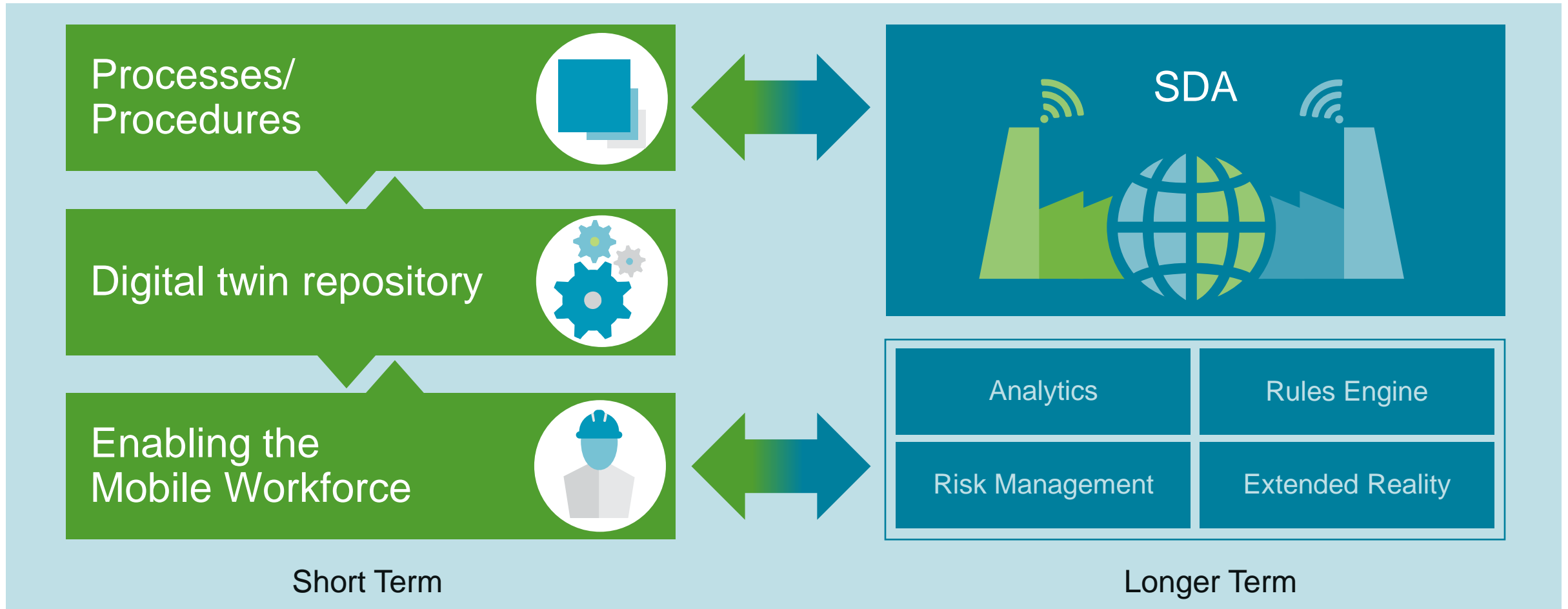
- «A digital replica of physical assets, processes and systems that can be used for various purposes» *GE Digital*
- *Key Aspects:*
 - Includes asset configuration, geometry/topology and metadata
 - Includes information from IoT sensors
 - Dynamic and constantly evolving
 - Can be leveraged to enable value added work processes
 - Can be analyzed, include AI/Machine Learning to provide meaningful insights
- *Is a prerequisite to enable successful digital transformation of work processes*

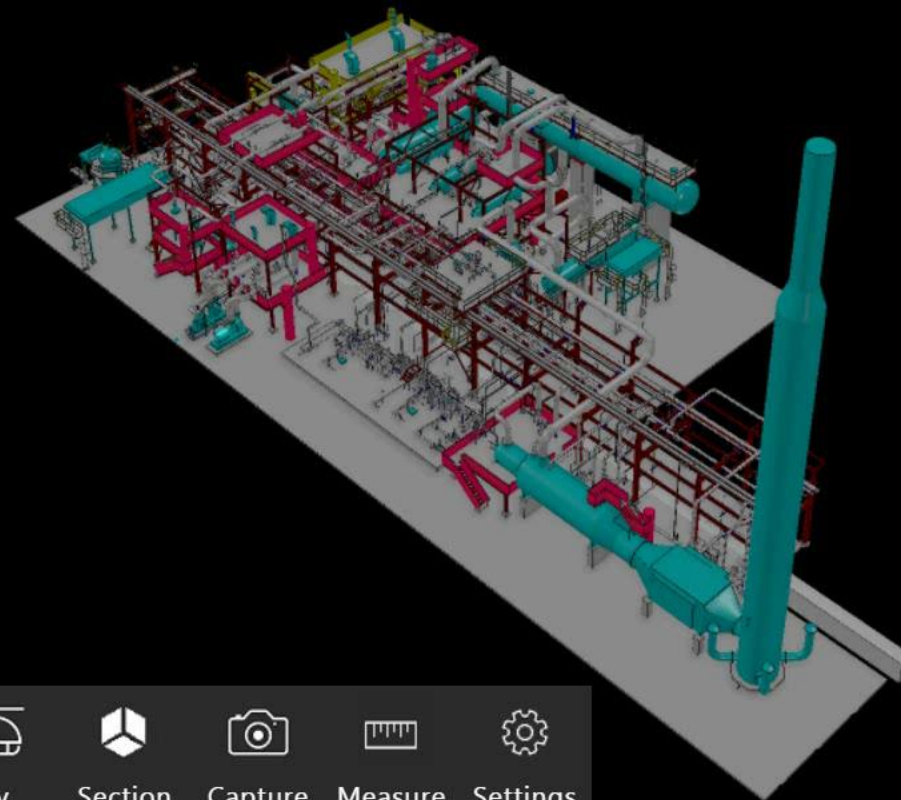


Positioning of SDA / Digital Twin in the Operator system landscape

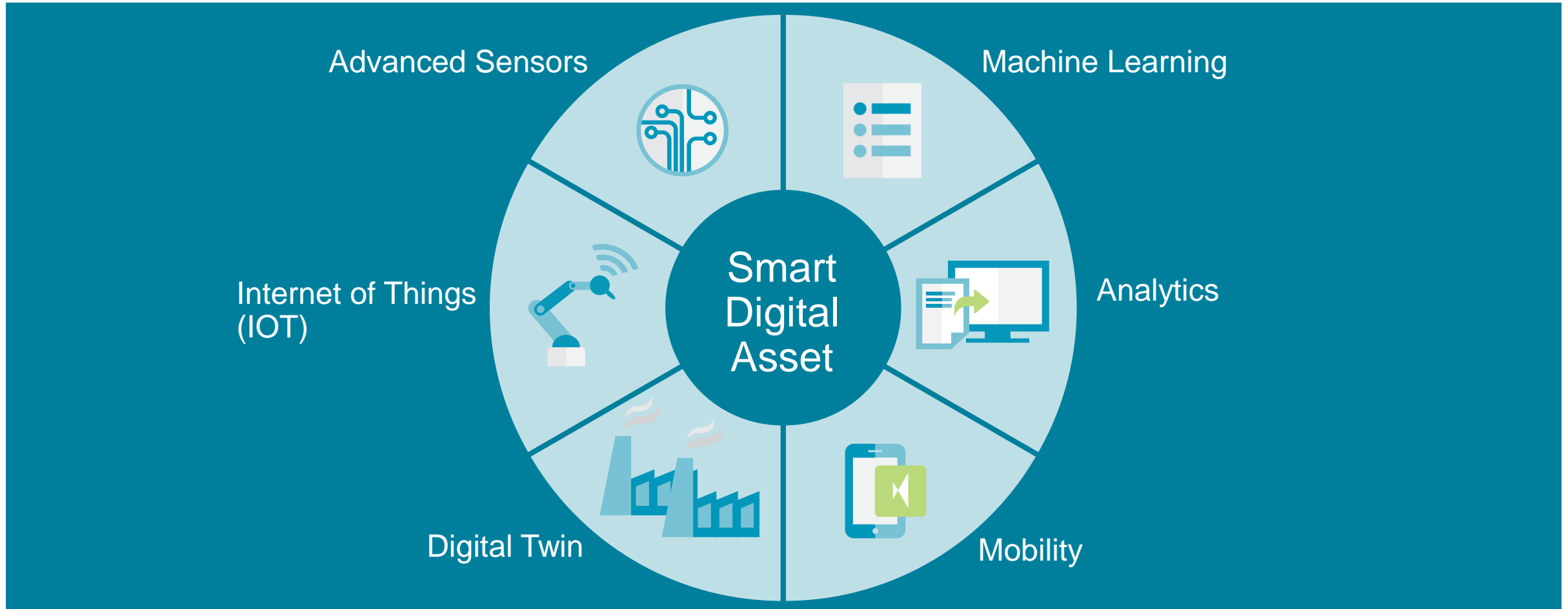


Hexagon PPM's Smart Digital Asset RoadMap Vision

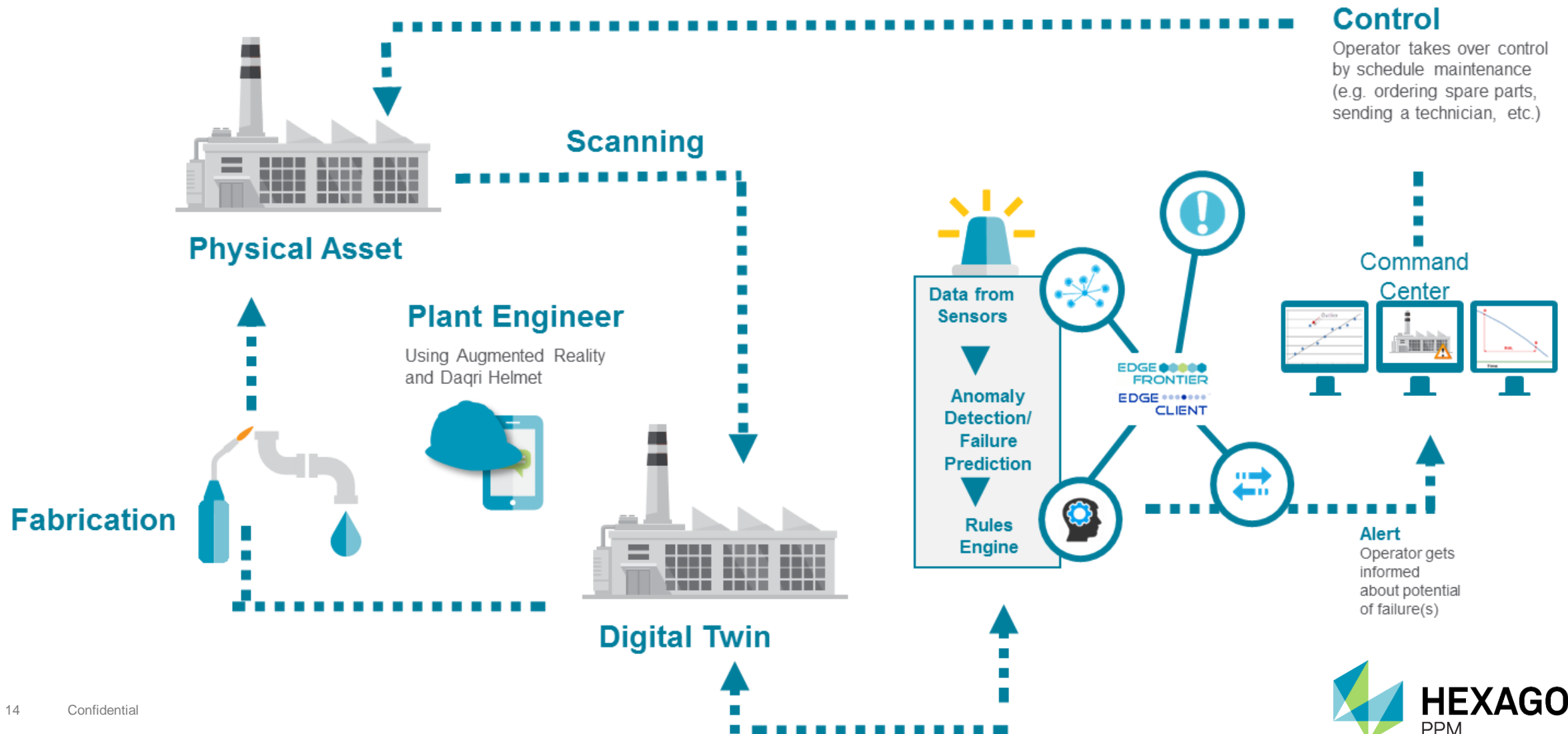




Realize the potential of SDA



Digital Twin – scenario in predictive/perscriptive maintenance



HxGN Smart Visualization

Collaborative XR - Core technology for next gen products & Workflows



Providing Interoperability and example Integration with SAP PM?

Cloud Integration via web service APIs (RESTful/Odata 4)



SDA Connector for Plant Maintenance

Intergraph Smart®
and SmartPlant
Solutions

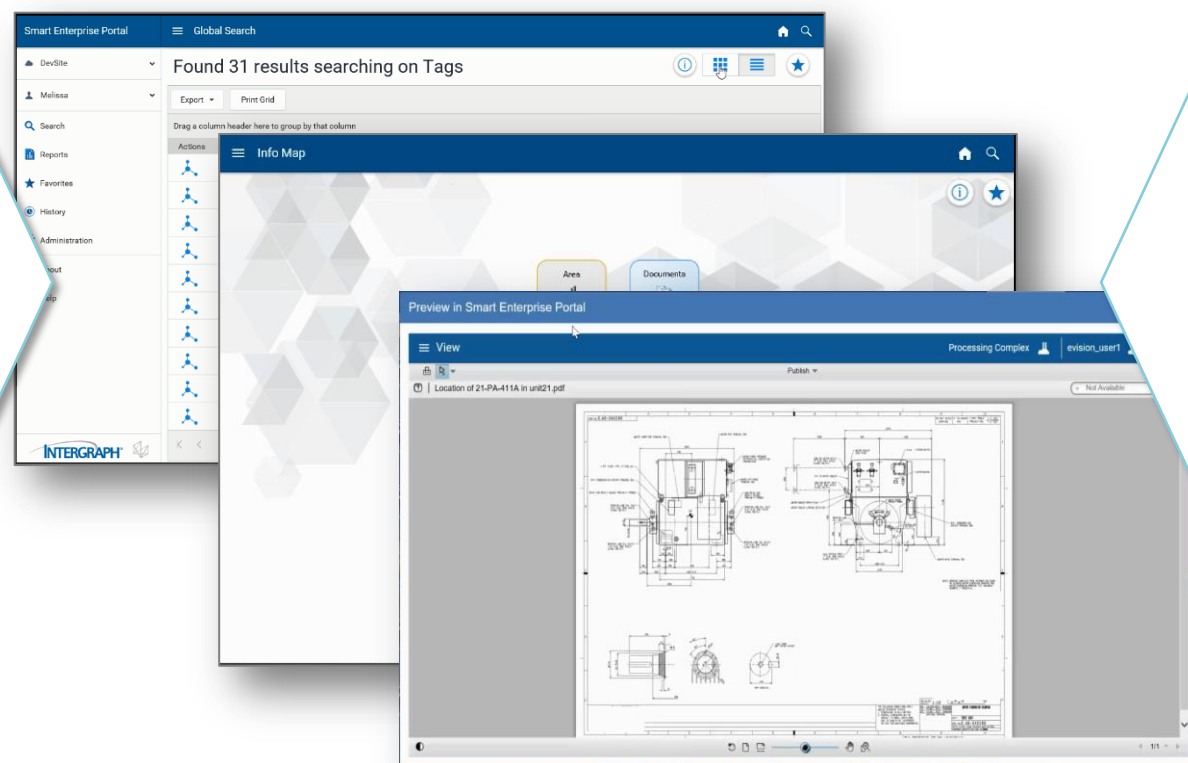
Intergraph Smart® Digital Asset

SmartPlant® Foundation

SmartPlant® Enterprise
for Owner Operators

SmartPlant® Fusion

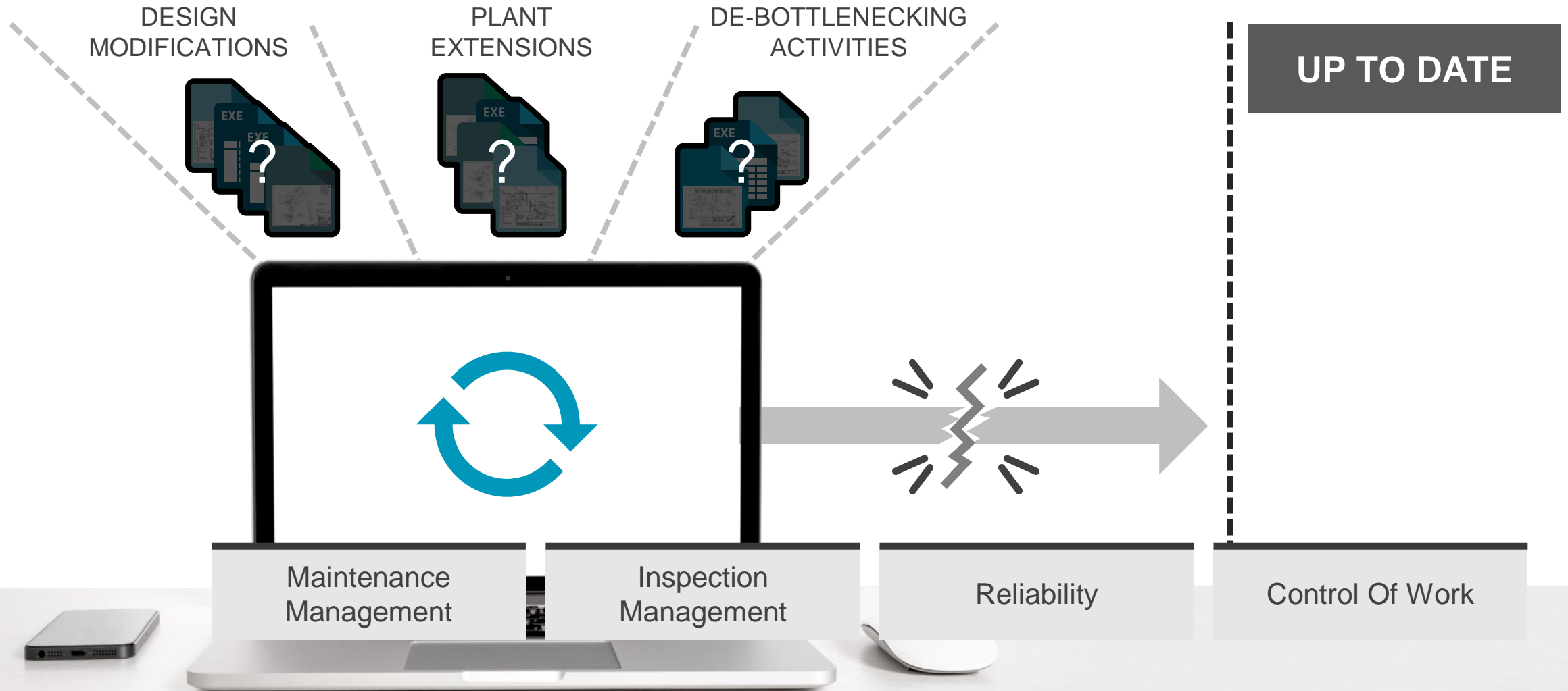
WEB
SERVICES



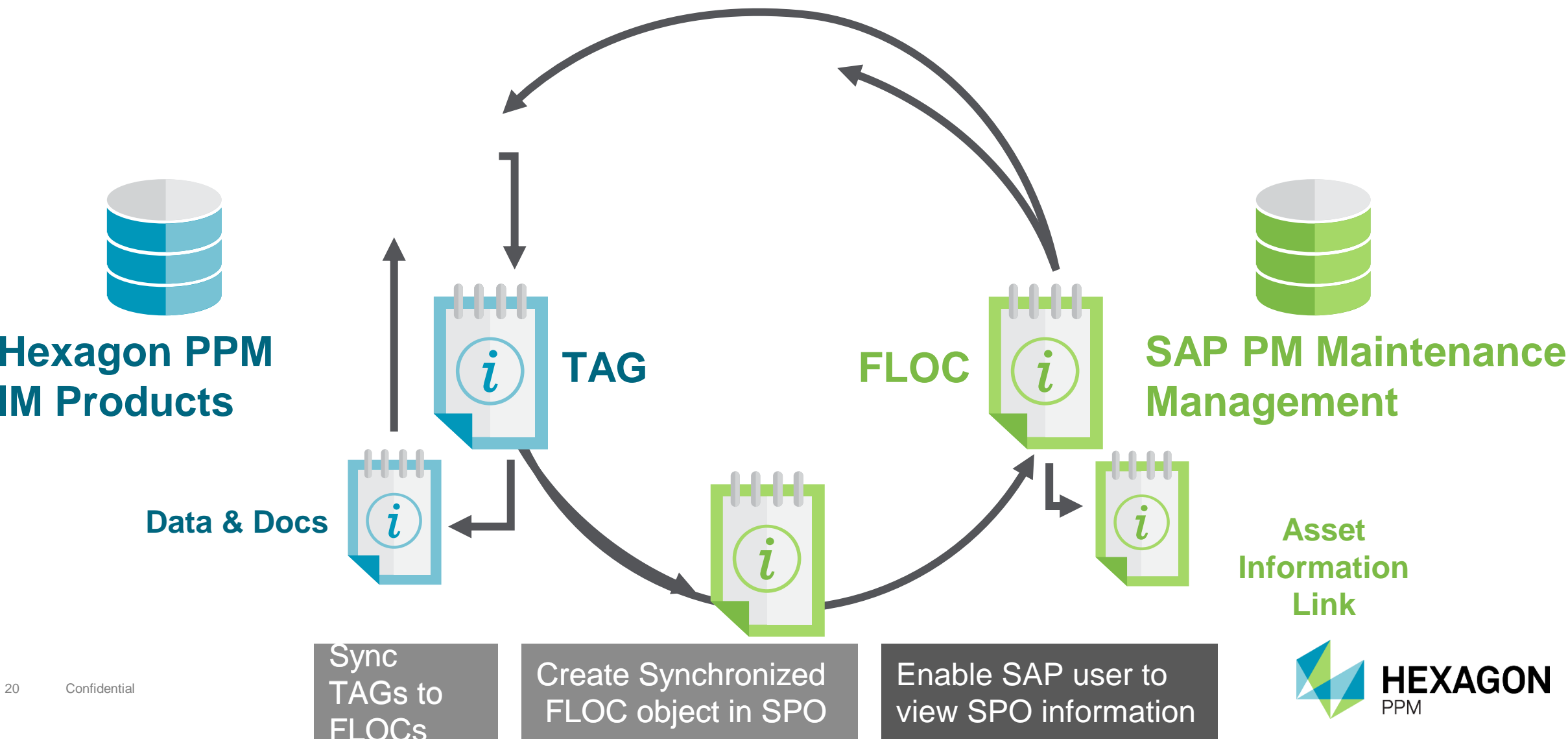
- Maintenance Planning
- Inspection Planning
- Turnaround Planning

SAP® Certified
Powered by SAP NetWeaver®

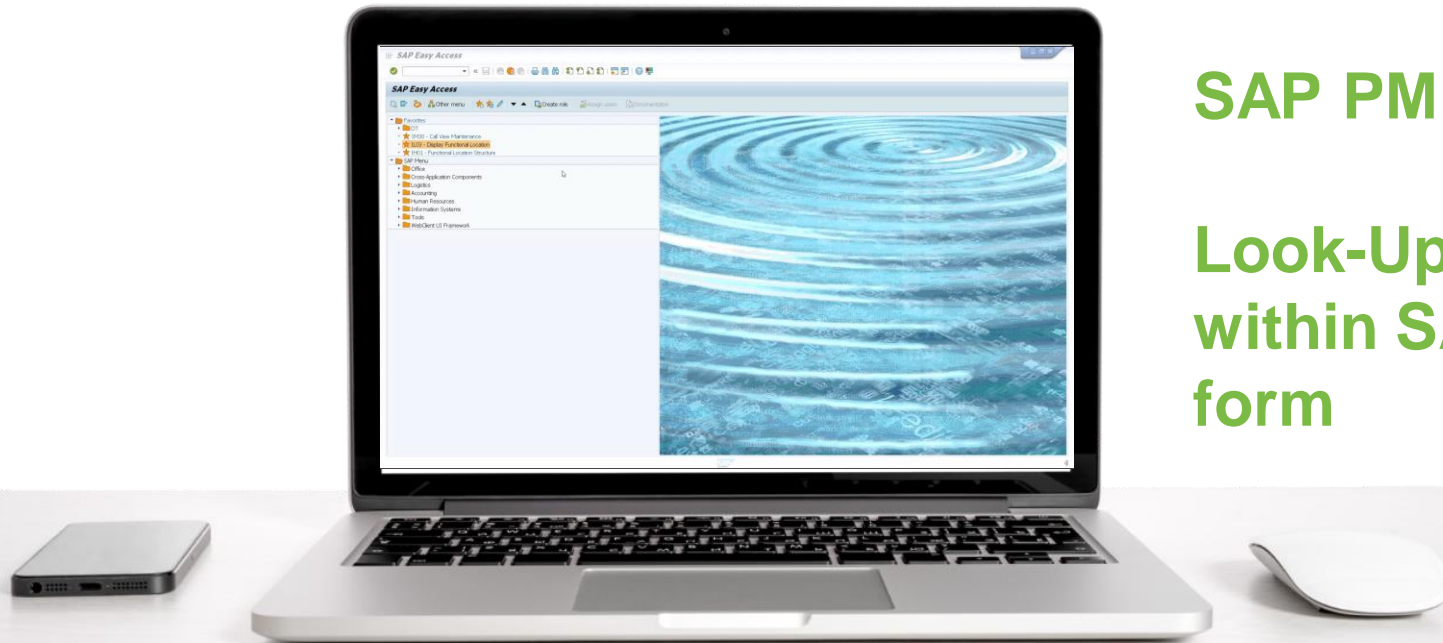
OWNER OPERATOR CHALLENGES



Synchronizing Engineering Tags with Operational FLOCs and Asset information link



Demo: Asset Information Link for SAP



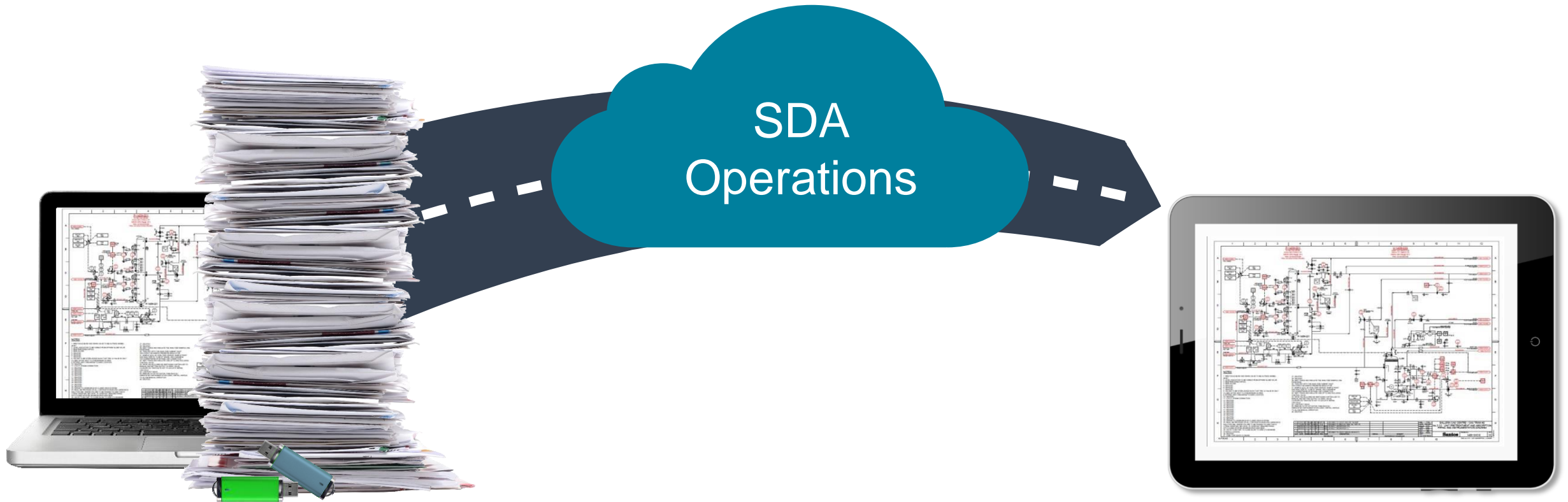
SAP PM Maintenance Management

**Look-Up Engineering Data from
within SAP PM FLOC Master data
form**



Capturing the Brownfield Digital Twin

Asset Lifecycle Information Management Cloud Service



Processing of legacy and submitted deliverables

Rapid Capture

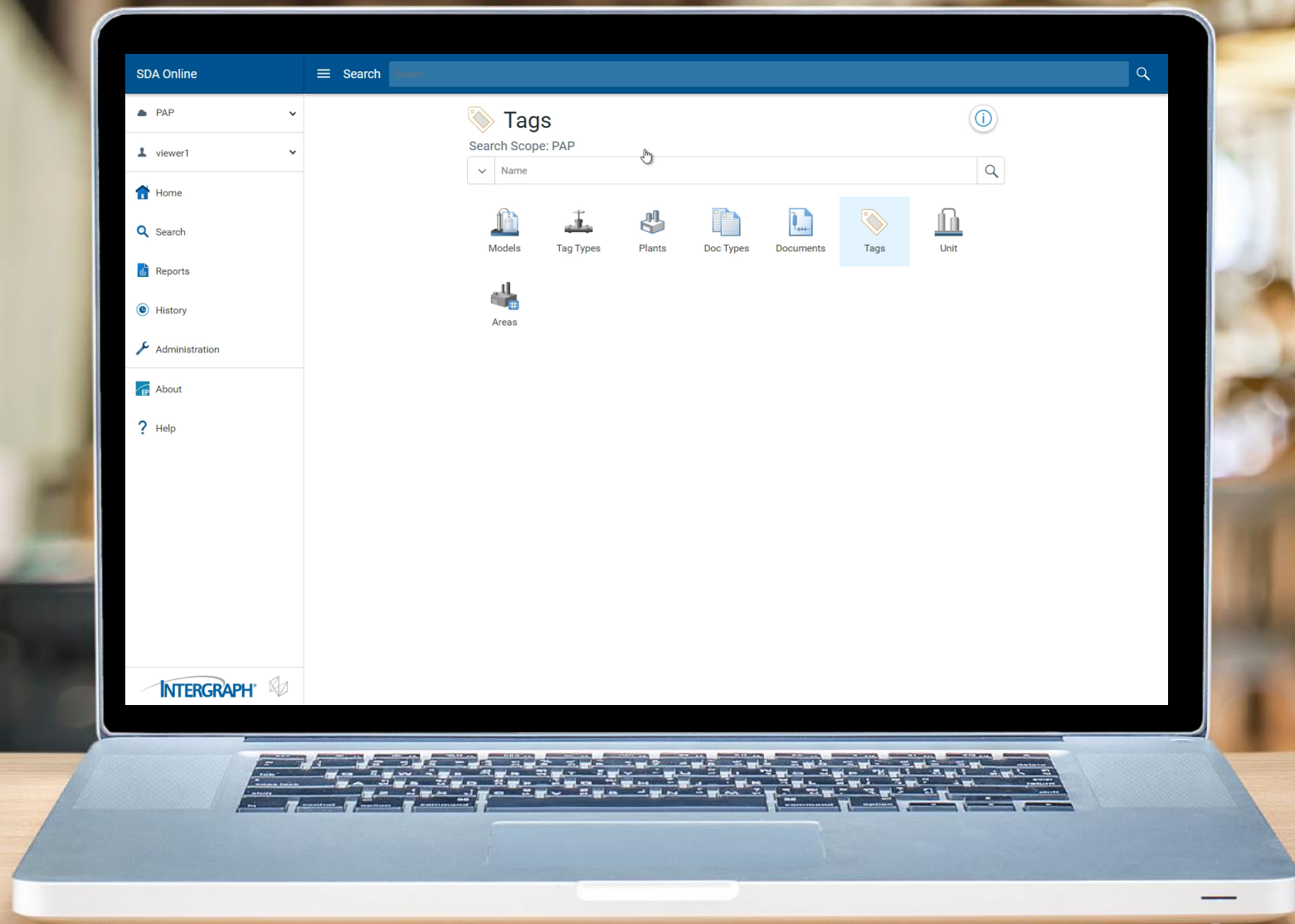
Identifying Best Masters

Extract intelligence & creates links

Quality Control & Reporting

Information Browsing







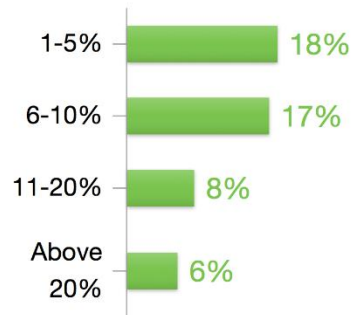
Handover Challenges

Handover Challenges – handover effort

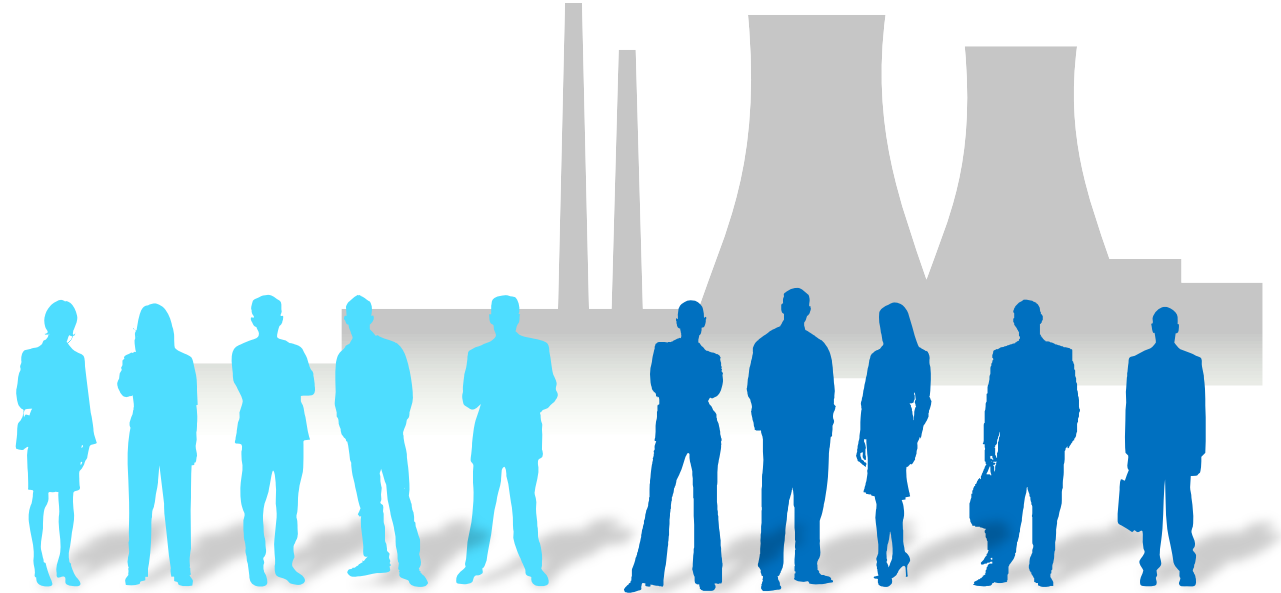


Project hours spent on information handover

As an EPC, what percentage of total project hours is spent dealing with information handover?

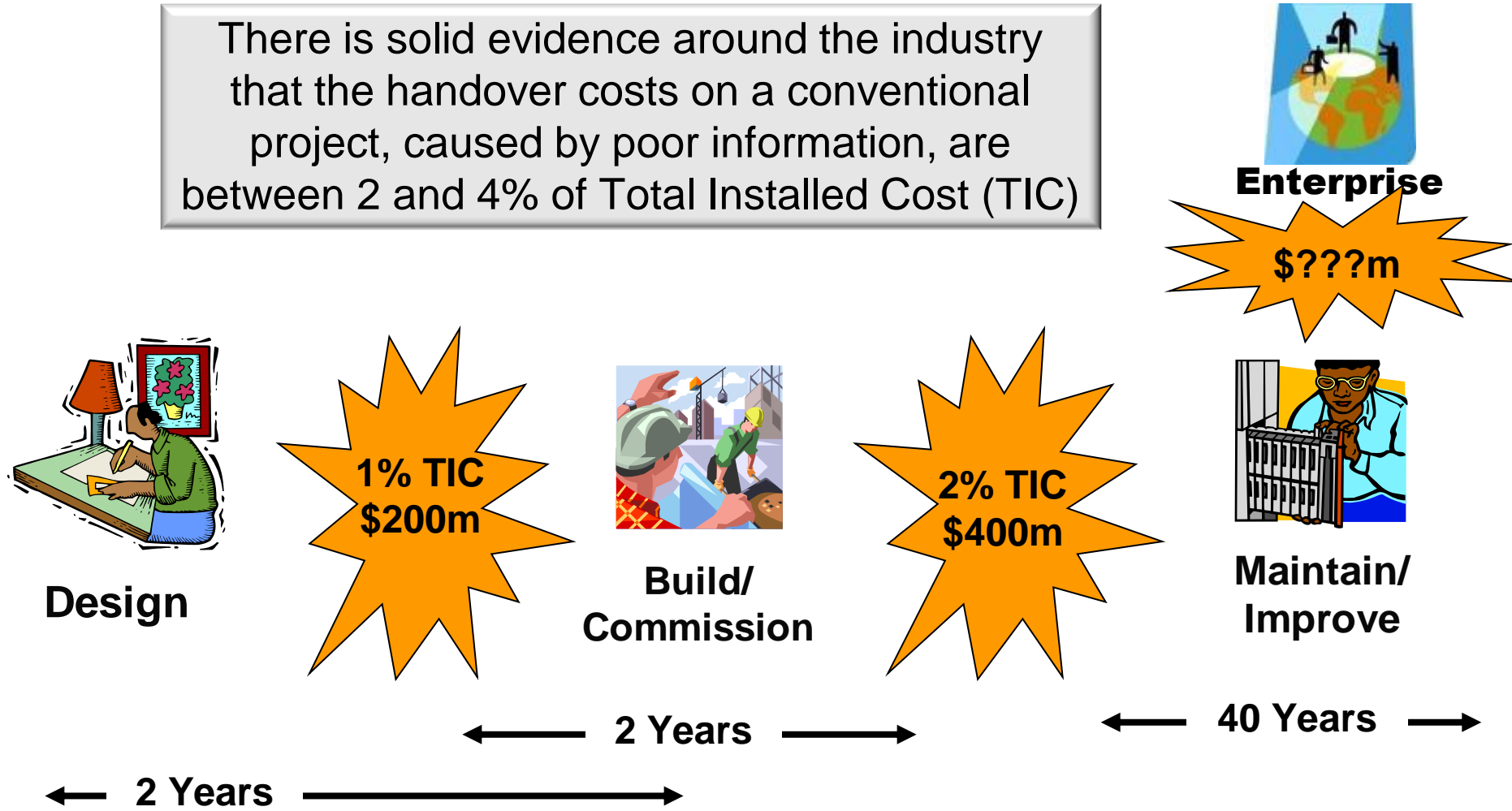


Source:  Survey of 72 professionals in process industries



The Owner Operator Challenge

There is solid evidence around the industry that the handover costs on a conventional project, caused by poor information, are between 2 and 4% of Total Installed Cost (TIC)

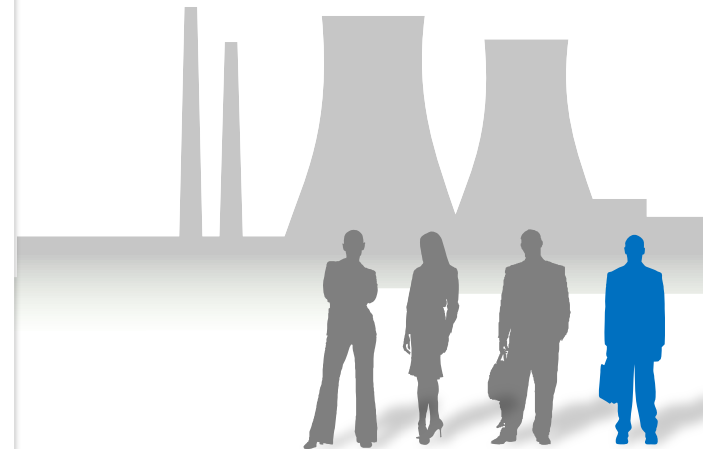
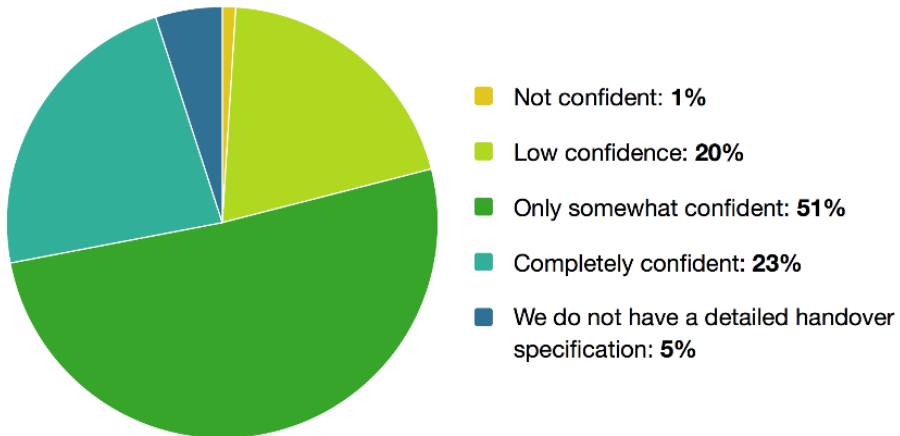


Handover Challenges - Specification



Confidence in handover specification

How confident are you that the handover specification in your contracts reflects all organizational requirements for operating and maintaining the facility?





What is CFIHOS?

CFIHOS? (pronounced “See-Fos”)



What is CFIHOS?

- An emerging standard for Capital Facilities Industry Handover Specification
- Joint project sponsored by USPI (Netherlands) and ENAA (Japan)
- Based on Shell DEP, which has been used in 60+ capital projects
- A pragmatic extension of existing Industry Standards (ISO 15926, ISO 14224, API, ISA, POSC Caesar, etc.)

Why are we adopting it?

- We can deliver a working **OOTB solution**
- Avoid redesigning tag classifications and document types every project, reducing **time, cost and risk**
- **Demonstrable today.** Shell's *EIS* configuration in *EDW* is CFIHOS.
- **OO's are asking for it**
- **EPC clients are adopting it**



nfile

ExxonMobil

INPEX



TOTAL



bp


















JGC

JGC CORPORATION

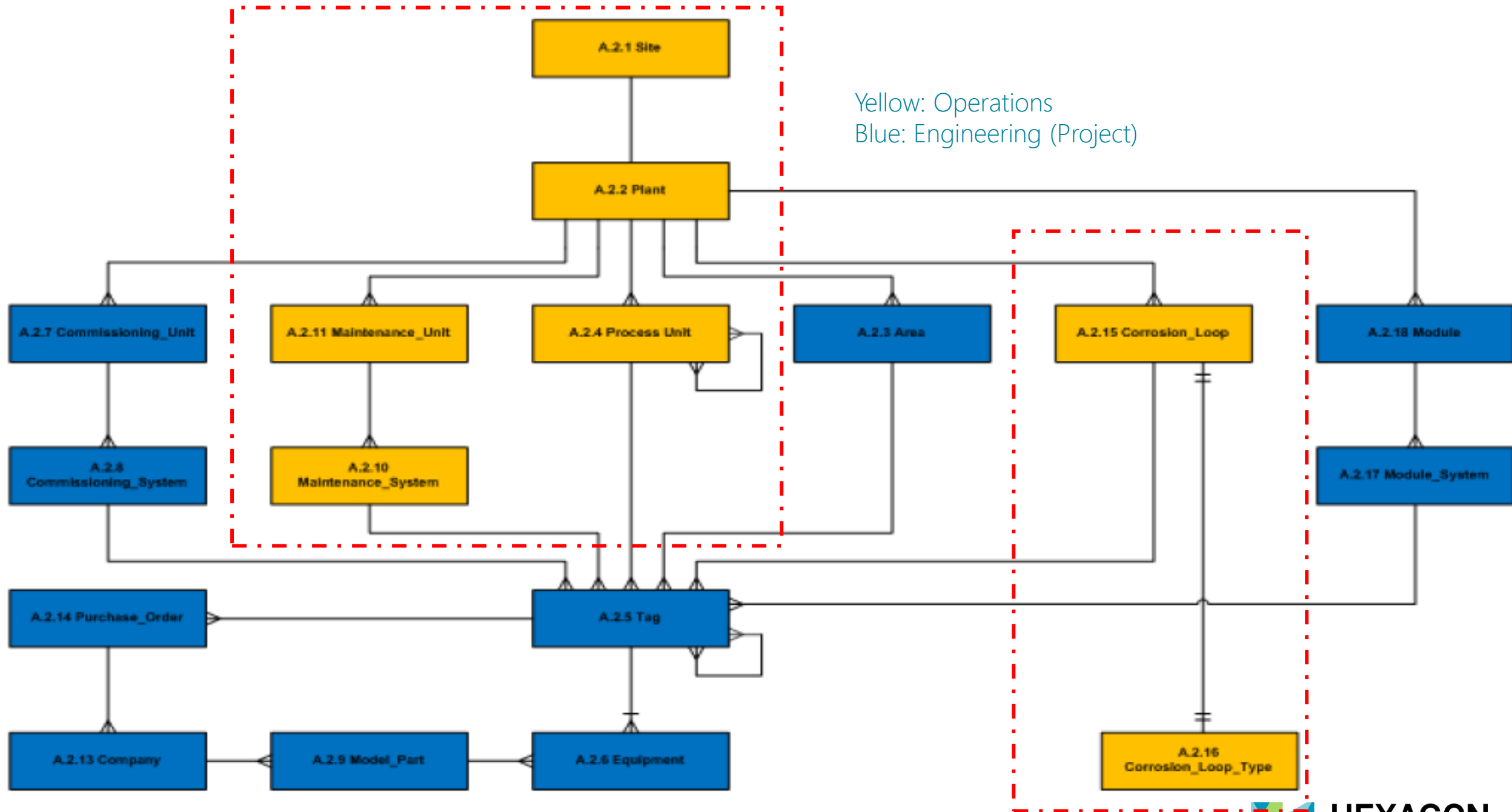
Technip



What is CFIHOS?

-  ScopeofWork CFIHOS V1s2_21apr2015
-  Specification CFIHOS V1s2_21apr2015
-  CFIHOS discipline document type V1s2
-  CFIHOS discipline V1s2
-  CFIHOS document type V1s2
-  CFIHOS equipment class properties V1s2
-  CFIHOS equipment class V1s2
-  CFIHOS model part class properties V1s2
-  CFIHOS property picklist V1s2
-  CFIHOS property picklist value V1s2
-  CFIHOS property V1s2
-  CFIHOS RDL Master Objects V1s2
-  CFIHOS required documents per class V1s2
-  CFIHOS tag class properties V1s2
-  CFIHOS tag class V1s2

- Generic Scope of Work
- Generic Technical Specification
- Common Database Definition – Reference Data Library (RDL), Master Objects, Property, and Picklist definitions
- Tag Class, Tag Types and Properties per Tag type
- Equipment Class, Equipment Types and Properties per Equipment Type
- Document Types and properties
- Required Documents per Tag Class
- Model, Manufacturer
- Discipline, Discipline to Document Type
- Data Validation Rules



Example CFIHOS Line List Register

Tag Number		P&ID Number		System		Line Sequence Number		Line Size		Piping Specification		Insulation Type	
CFIHOS-10000166		CFIHOS-70000292		CFIHOS-00000005		CFIHOS-60000881		CFIHOS-40000247		CFIHOS-70000403		CFIHOS-50000060	
77-P-1001-12"-CX-1-SJ		77-D-G-007		P		1001		12"		CX-1		SJ	
77-P-1002-6"-CX-1-SJ		77-D-G-007		P		1002		6"		CX-1		SJ	
77-P-1004-10"-CX-1-SJ		77-D-G-007		P		1004		10"		CX-1		SJ	
77-P-1005-4"-CX-1-SJ		77-D-G-007		P		1005		4"		CX-1		SJ	
77-P-1007-12"-CX-1-SJ		77-D-G-007		P		1007		12"		CX-1		SJ	
77-P-1007-12"-CX-1-SJ		77-D-G-008		P		1007		12"		CX-1		SJ	
77-P-1008-10"-CX-1-SJ		77-D-G-007		P		1008		10"		CX-1		SJ	
77-P-1008-10"-CX-1-SJ		77-D-G-008		P		1008		10"		CX-1		SJ	
77-P-1009-16"-CX-1-ST		77-D-G-008		P		1009		16"		CX-1		ST	
77-P-1009-16"-CX-1-SJ		77-D-G-009		P		1009		16"		CX-1		SJ	
77-P-1010-28"-BX-1-HC		77-D-G-009		P		1010		28"		BX1		HC	
77-P-1011-24"-CB4B-HC		77-D-G-009		P		1011		24"		CB4B		HC	
77-P-1011-24"-CB4B-HC		77-D-G-010		P		1011		24"		CB4B		HC	
77-P-1012-30"-BX-1-HC		77-D-G-010		P		1012		30"		BX1		HC	
77-P-1013-34"-BX-1-HC		77-D-G-010		P		1013		34"		BX1		HC	
77-P-1014-30"-CB4B-HC		77-D-G-010		P		1014		30"		CB4B		HC	
77-P-1014-24"-CB4B-HC		77-D-G-011		P		1014		24"		CB4B		HC	
77-P-1015-28"-BX-1-HC		77-D-G-011		P		1015		28"		BX1		HC	
77-P-1016-34"-BX-1-HC		77-D-G-011		P		1016		34"		BX1		HC	
77-P-1017-24"-CB4B-HC		77-D-G-011		P		1017		24"		CB4B		HC	
77-P-1017-24"-CB4B-HC		77-D-G-012		P		1017		24"		CB4B		HC	
77-P-1018-24"-CB4B-ST		77-D-G-012		P		1018		24"		CB4B		ST	
77-P-1018-24"-CB4B-ST		77-D-G-013		P		1018		24"		CB4B		ST	
77-P-1019-28"-BX-1-HC		77-D-G-012		P		1019		28"		BX1		HC	
77-P-1019-28"-BX-1-HC		77-D-G-013		P		1019		28"		BX1		HC	



Thank you!

Please send any questions to Adrian Park
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