

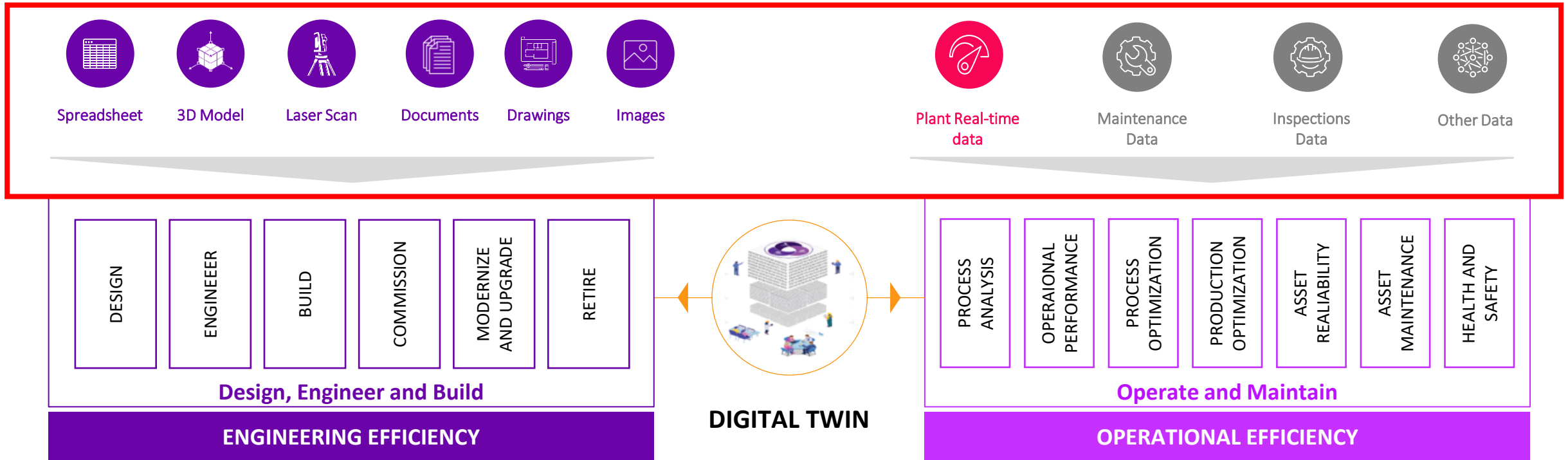
MAY 19TH, 2022

AVEVA Asset Information Management – Complying with a CFIHOS Handover Using Engineering Information Management Tools

Steve Parvin

AVEVA

Creating a digital thread that enables information mastery across the asset lifecycle for faster and trusted decision making



Industrial Information Integrity (Enterprise-wide governance for compliance, consistency and completeness)



Engineering Information Management



Operations Information Management



Transactional Information



What is CFIHOS?

CFIHOS' aim is to offer practical standardised specifications for information handover that work for anyone involved in the:

- Making
- Operating
- Maintaining
- Decommissioning

Of industrial facilities including everyone in the information supply chain - operators, contractors and equipment manufacturers and suppliers.



CFIHOS



Capital Facilities Information HandOver Specification

- CFIHOS is managed by the International Association of Oil & Gas Producers (IOGP) under Joint Industry Programme 36 (JIP36).
- AVEVA are active members of CFIHOS
 - Members of the Backlog Team
 - Members of the Admin Team
 - Team Lead Software Vendors Team



[HTTPS://WWW.JIP36-CFIHOS.ORG/](https://www.jip36-cfihos.org/)

What is an Information Handover Specification and why is one needed?

Problems with Large Projects

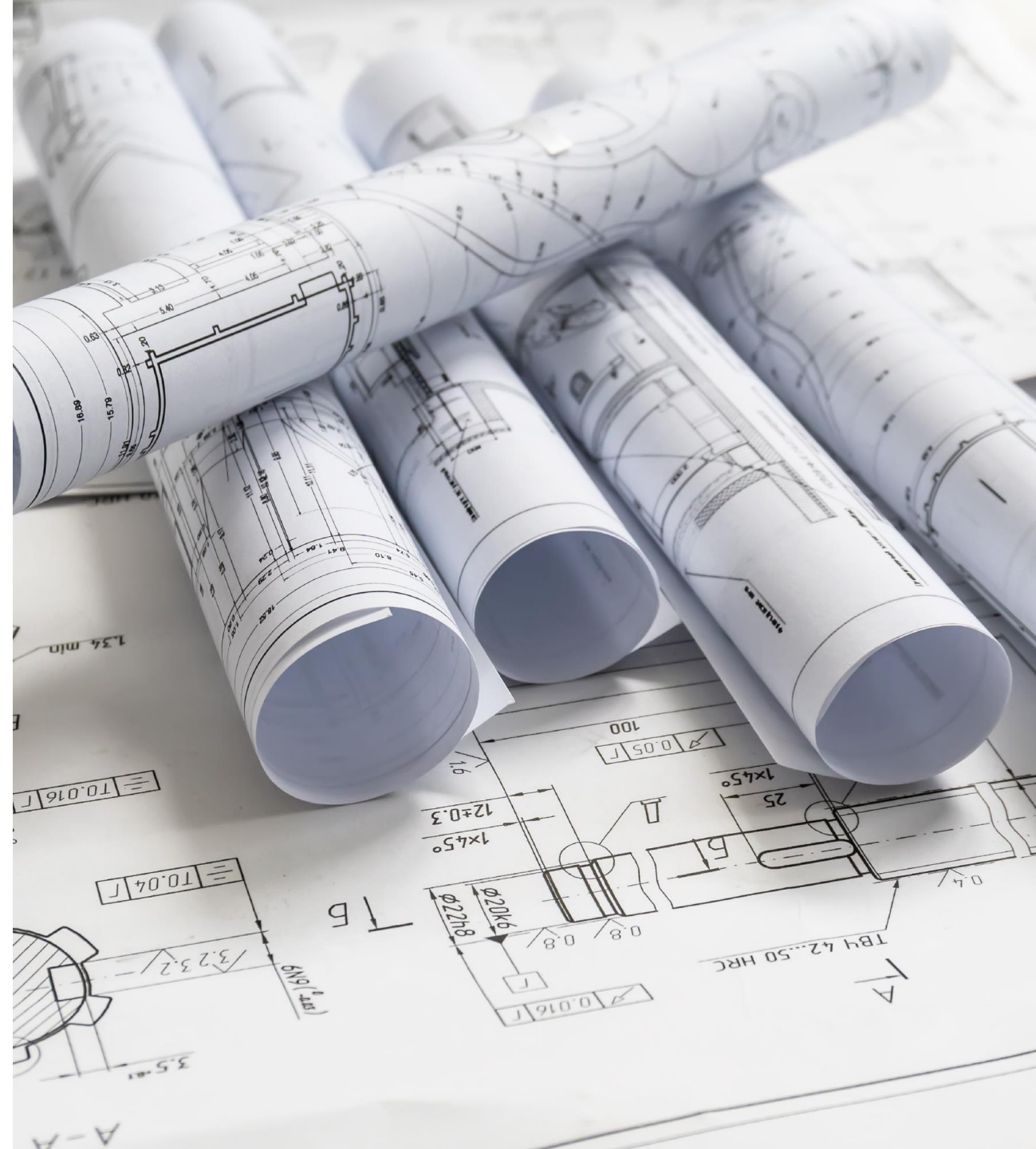
Most (65%) mega projects run into problems:

- overrun schedule by 25% or more
- exceed budget by 25% or more
- or have continuing and severe issues during the first 2 years of operations

Typical causes are:

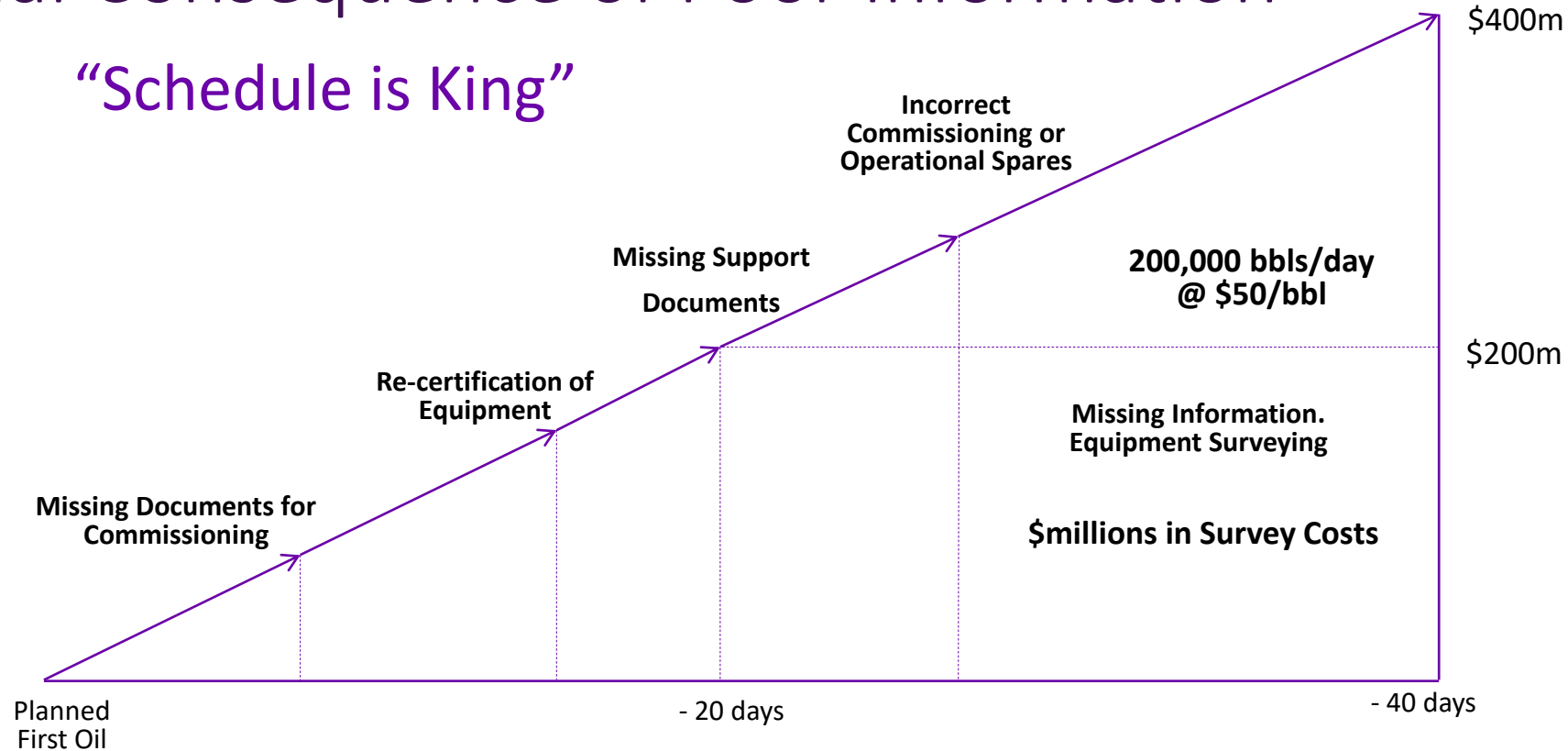
- Contractual Frameworks
- Aggressive Schedule
- Cost Cutting
- **Poor Front End Loading**
- **Incomplete or Incorrect Basic Data**

Industrial Megaprojects: Concepts, Strategies, and Practices for Success, Ed Merrow, 2011



Financial Consequence of Poor Information

“Schedule is King”



- Average Project has **40% complete data at start-up.**
- Average of **25% employee time spent searching for information.**
 - Poor control of inventory, maintenance and plant status

Traditional Handover



Last day – First Session of the Morning Fusion last night!

Interactive Session

AVEVA

Information Handover - Pitfalls

Without a good Handover Specification!

- To demonstrate a few common areas where Information Handover goes wrong, we're going to carry out a few activities.
- These are analogies which can be used to help us as Information Managers explain to people why information handover doesn't always go as planned.
- Each activity points to a course of action to help avoid common pitfalls.



Activity 1

- On the next slide is a picture of an object I want you to describe it to me.
- Any volunteers
- Ready.....
- Go.....

- I didn't say I'd show it to you?
- Is that fair?



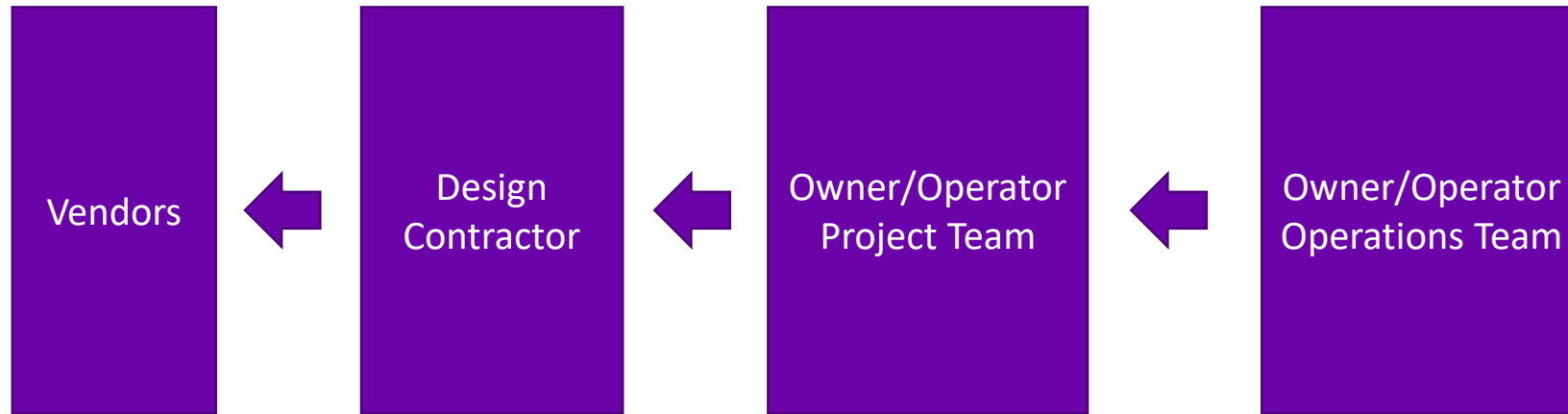


So was it a trick question?

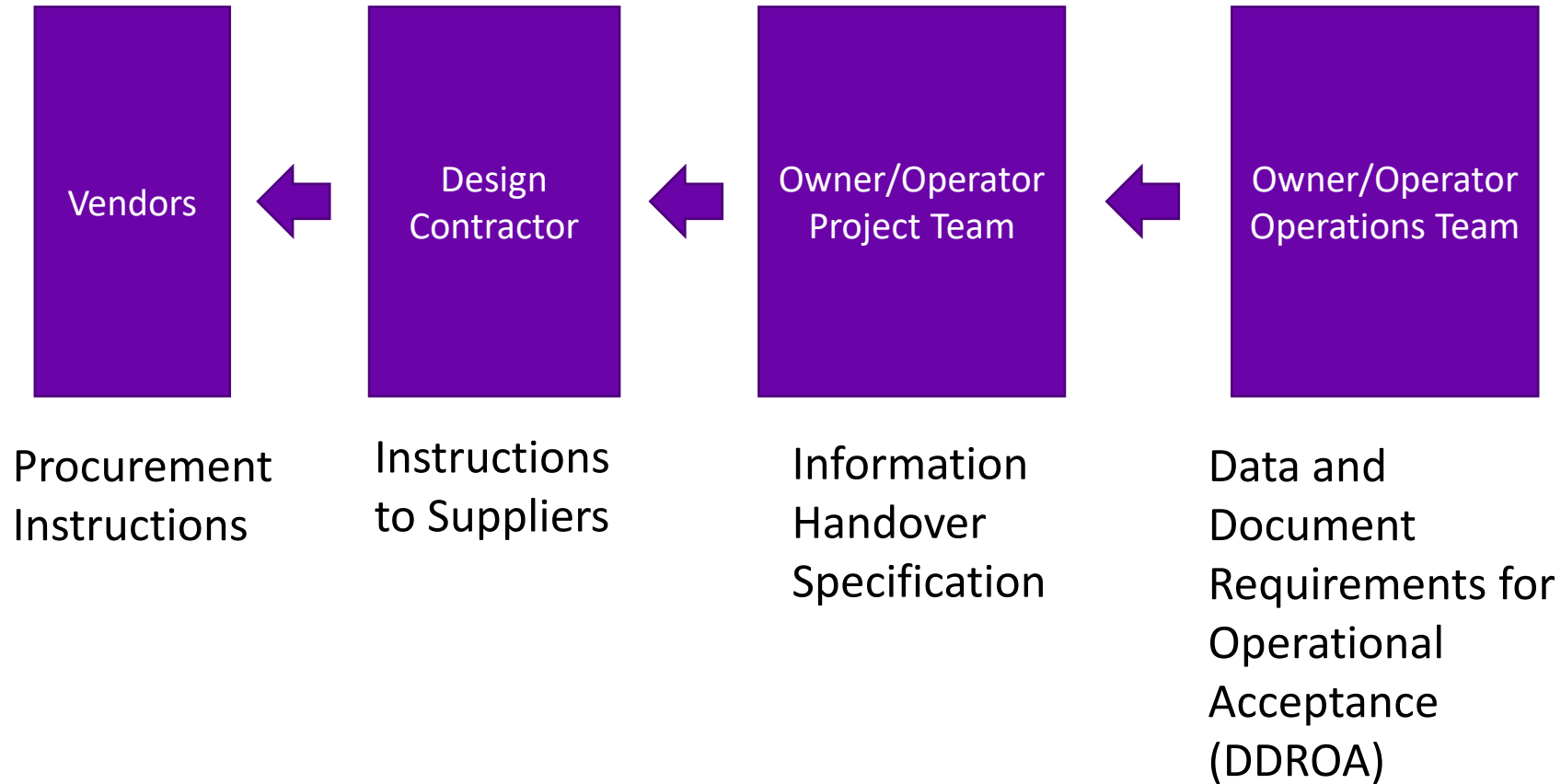
- Unfortunately, No!
- Many projects start up without really understanding what the operations side of the business requires.
- It's all about the typical timing of projects
- When the stakeholders get engaged and when the contracts are signed.



Information Supply Chain



Information Supply Chain – Example Specifications



“Begin with the end in mind.”

Stephen Covey

1. We need to know the information we want handing over
...and we need it defined early

Obvious, but often overlooked!

Activity 2

- On the next slide is a picture of an object I want you to describe it to me.
- Any volunteers
- This time I promise to show you the picture.
- Ready.....
- Go.....

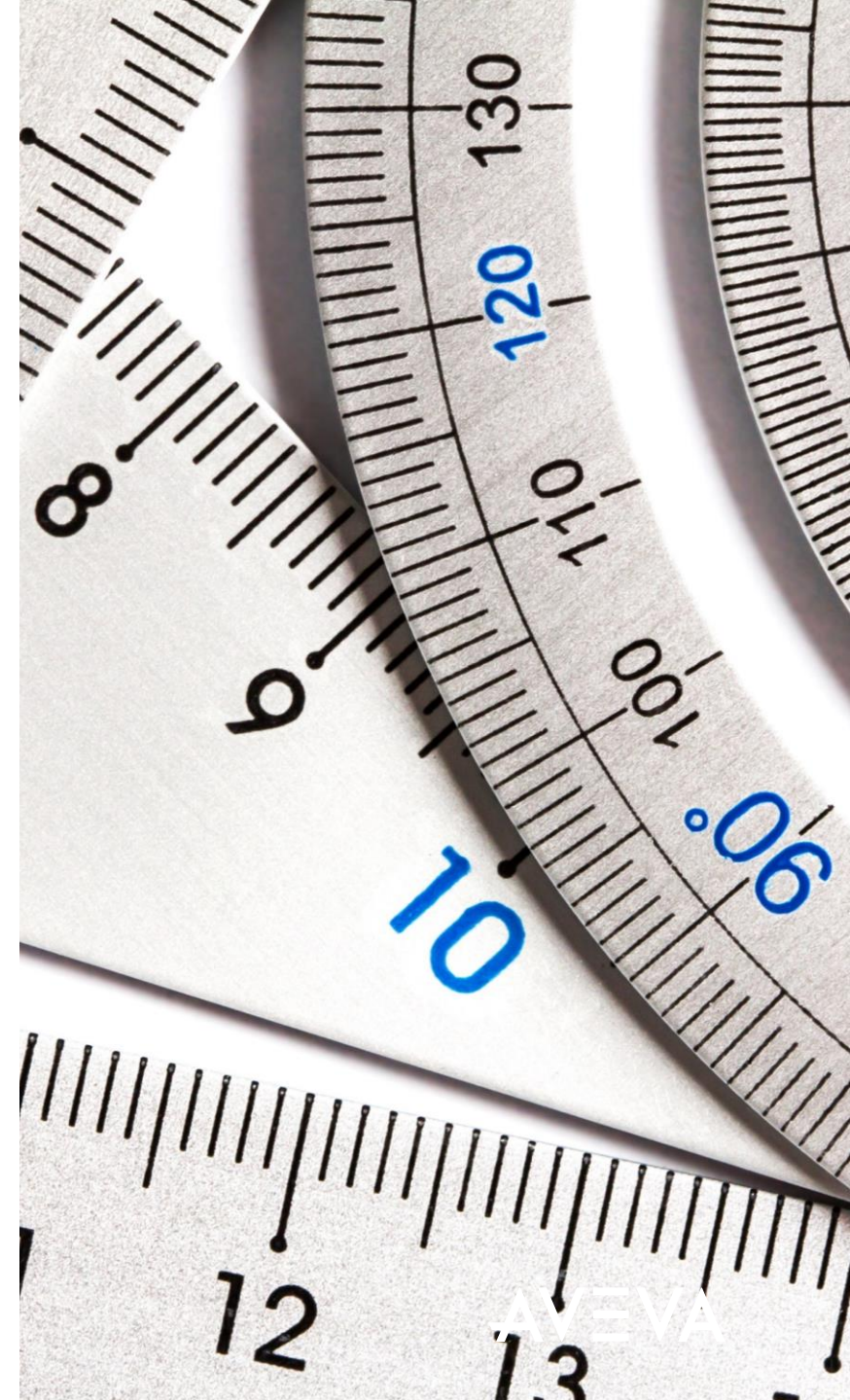




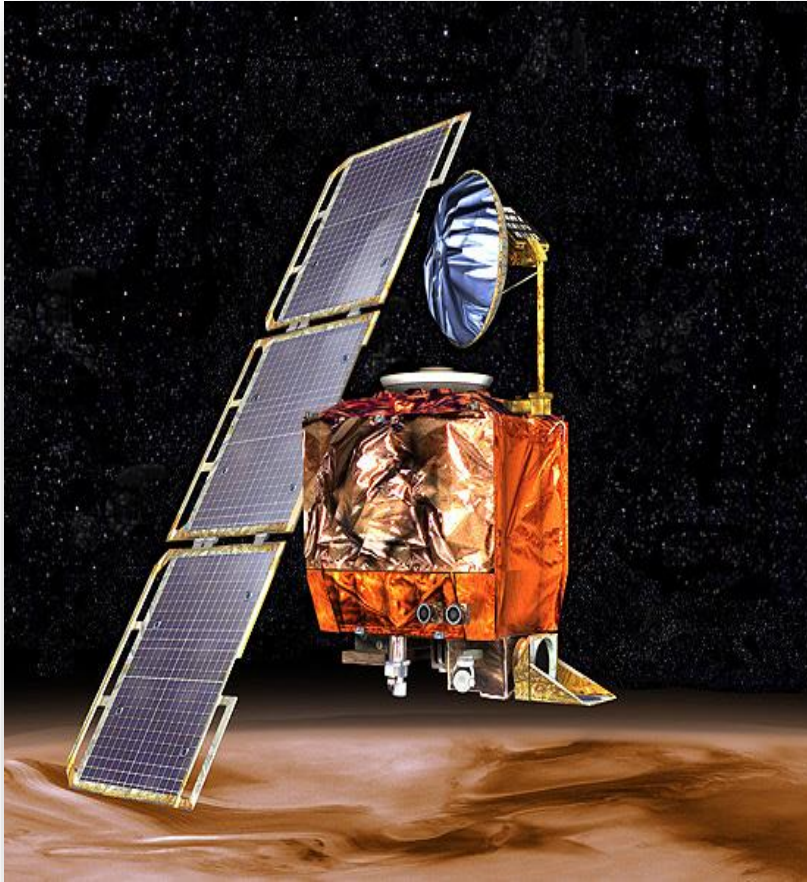


We need to be very prescriptive in what we ask for?

- Deliverables from a project require accurate definition.
 - Content
 - Format
 - Structure
- We need some degree of common terminology.
 - Reference Data Library
- Even down to Units of Measure used for every attribute!



Example of Poor Information Management



Mars Climate Orbiter
“The Metric Mixup”

- Flight System Software performed calculations using Newtons (Ns)
- The ground crew entered their course corrections using Pound-Force (lbf)
- **Cost \$327.6 million**

It's important we all have a common understanding and use a common language

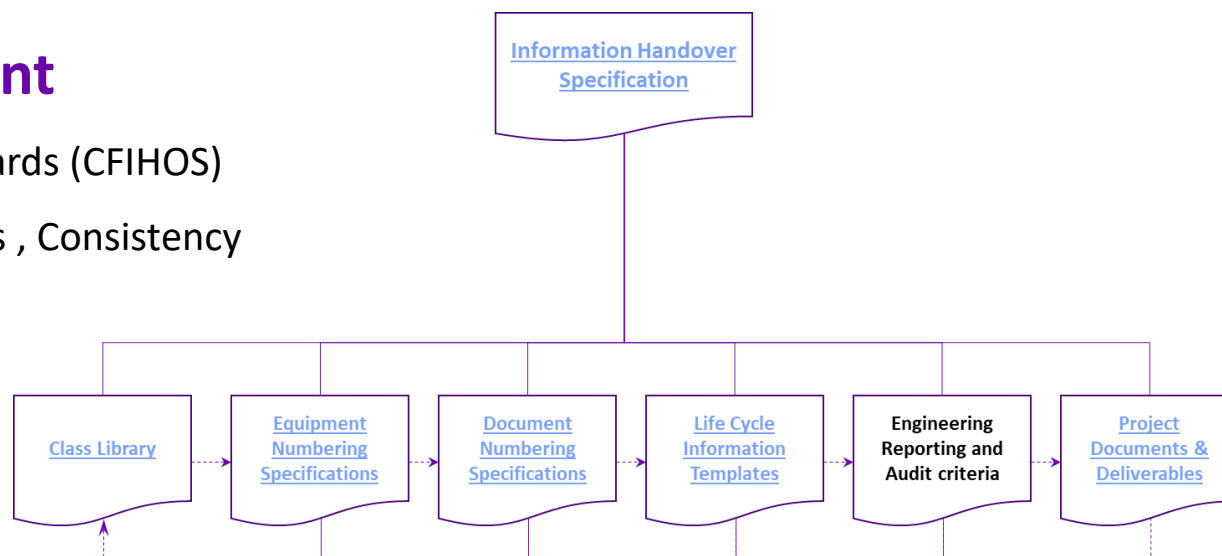
Project Information Handover Documents

• Information Handover Process

- Handover Strategy
- Handover Standards (Tech Passport)
- Handover Requirements
- Handover Plan

• Data Management

- Conformance to Standards (CFIHOS)
- Integrity, Completeness , Consistency
- Tagging Requirements
- Tag Associations



• Document Management

- Handover Process
- Formats, Content & Templates
- ISO 8859 Language Support
- Archiving, Retention & Management

• 3D Model Management

- Model Handover Standards
- Naming and Tagging requirements
- EPC/Vendor skid Packages
- As-Built Requirements

““Fast is fine but accuracy is everything”

Wyatt Earp

2. We need detailed and unambiguous requirements

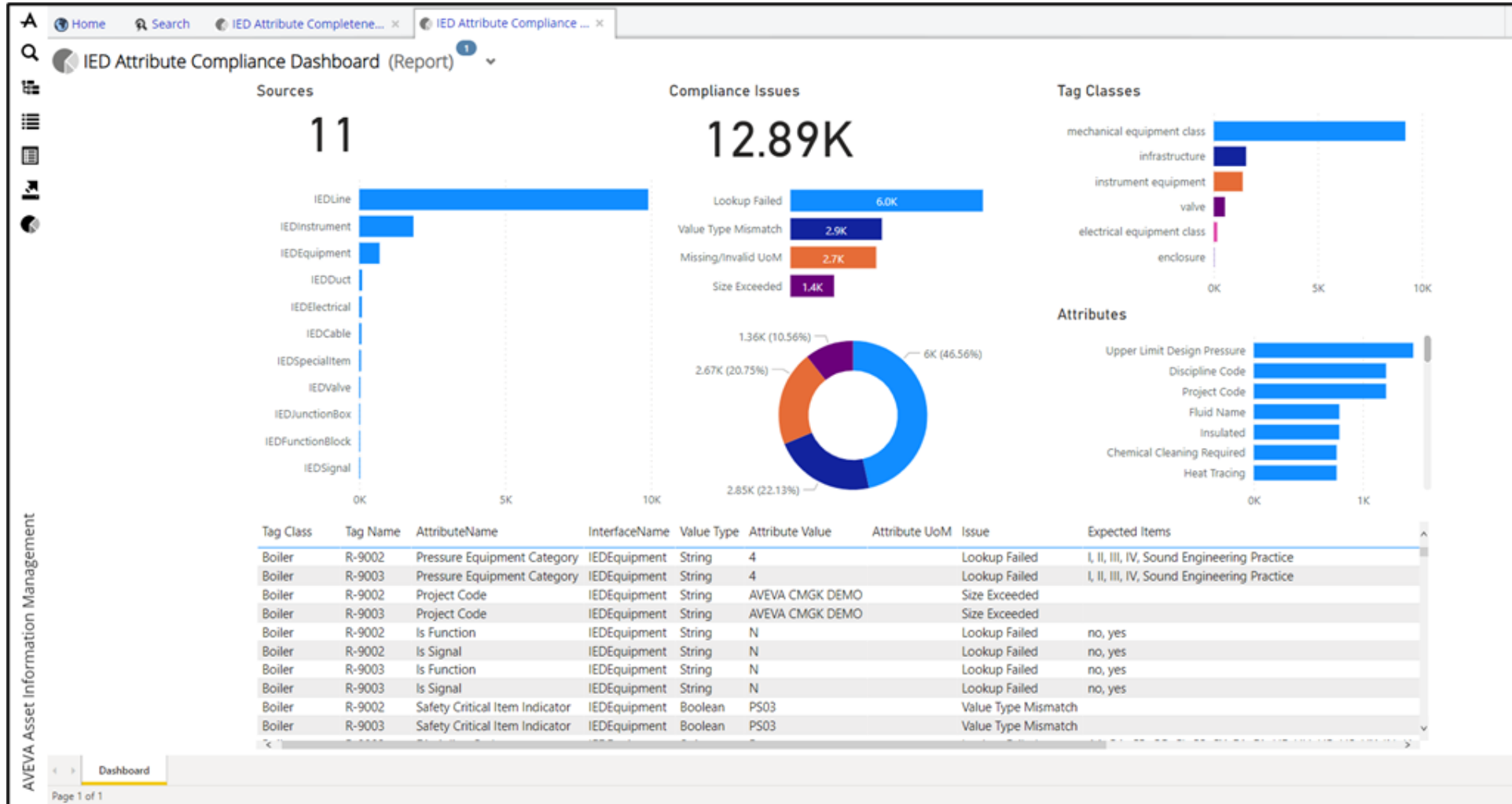


Always check the quality of the deliverables

- **Do the deliverables line up with what we expect?**
 - Attributes
 - Units of Measure
- **Are they complete?**
 - Null values
 - TBA/TBC/NA
- **Is the format correct?**
 - Data Delivery Type.
 - Field Size. Illegal Characters
 - CSV/Native Files/CAD Frames/Symbol Sets etc.
- **Are we confident that we can use them?**
 - Aligned with target systems
 - Gives the information we want at the right level of detail



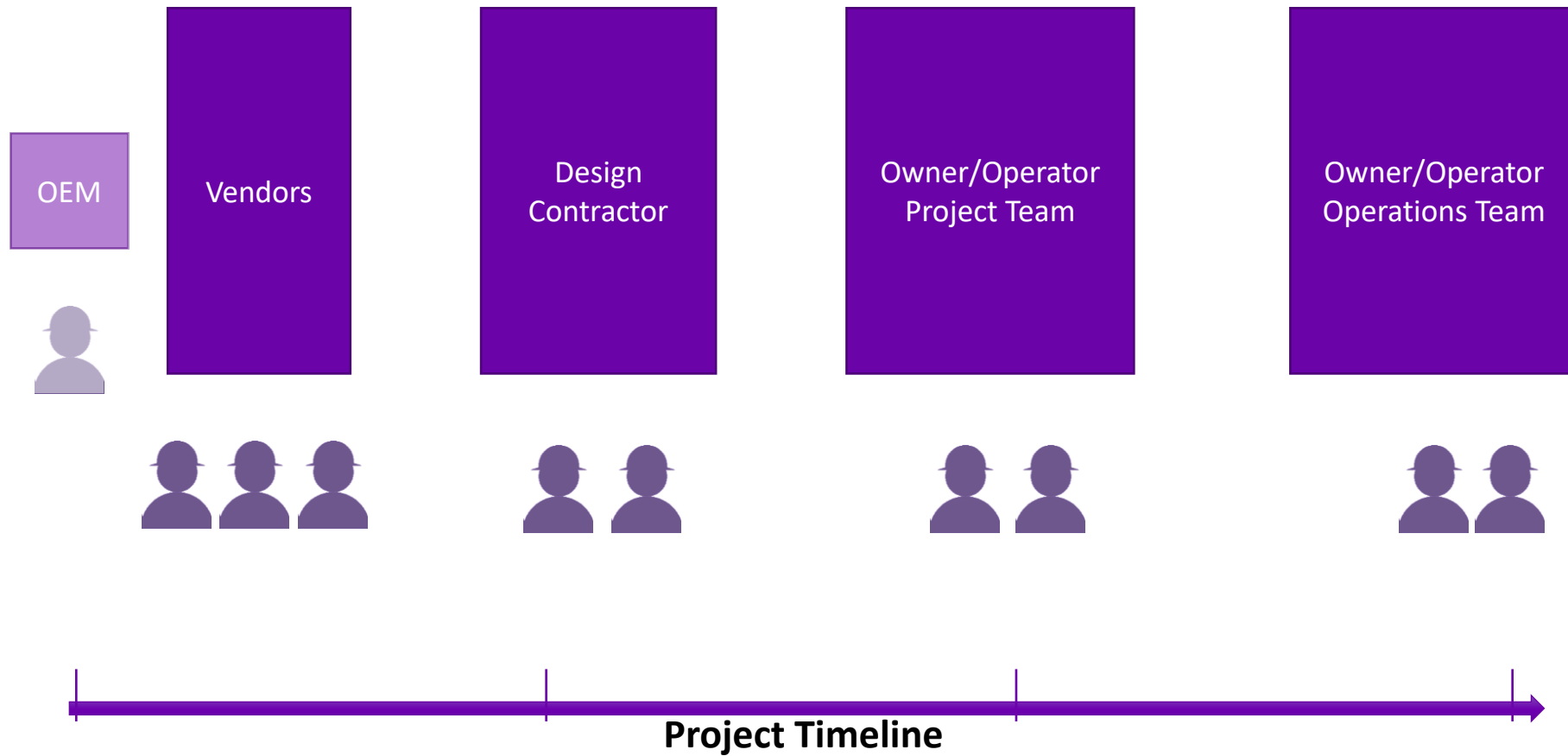
Check the Quality and Completeness



Timing – Don't wait for the end of the project

- If you build up your picture of the quality of the data early, **You can address it early.**
- Support can be provided to focus on gaps in data or address poor data quality
- Bringing data in early and checking it will help with other activities
- As data develops against the requirements it can be used to assess readiness for key project activities
 - Procurement
 - Construction
 - Completions
 - Commissioning
- In the same way it can identify data gaps that will potentially impact project schedule

Project Timeline and Stakeholder Disengagement



Let's go back to an earlier statement

- **Average plant has 40% complete data at start-up.**
- **What we need to do to avoid this is:**
 - **Assure Project Data Quality for Operational Readiness**
 - Data gathering during project execution
 - Measuring data integrity across sources
 - Publishing validated information to target systems
 - **Control Project Data Handover and Information Quality**
 - Progress and status monitoring
 - Validation of project standards
 - Engineering register / Master data management



Summary of Key Points

- Know what information is required to support your business.
- Ensure that it is asked for at the correct level of detail and supported by an appropriate contractual framework.
- Measure the quality and completeness of the deliverables against your defined standards.
- Don't wait until the end of the project. Measure the quality and completeness frequently.



Questions

How can CFIHOS help?

[Back to CFIHOS.](#)

AVEVA

CFIHOS



Capital Facilities Information HandOver Specification

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- AVEVA are active members of CFIHOS



[HTTPS://WWW.JIP36-CFIHOS.ORG/](https://www.jip36-cfihos.org/)



CFIHOS Overview

CFIHOS purpose is to create a handover specification that can be implemented by operators, contractors and equipment manufacturers and suppliers to standardize the specification of information handover requirements for a project.

That will significantly lower the lifecycle cost associated with incorrect and missing information required to operate a facility



CFIHOS at a Glance

What is it?

CFIHOS (pronounced see-foss) is an information standard delivering a common language for equipment and engineering deliverables across the supply chain.

The goal of CFIHOS is to eliminate the friction in getting the right information (data and documents) to start, operate, maintain, and decommission your facilities.

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Why now?

As CFIHOS matures, it provides an important service as a Rosetta Stone* to translate company specific terminology and requirements to industry language.

In industry we've not previously focused on efficiency as much as we do today. CFIHOS will bring us the ability to increase efficiency, reduce duplication and retain the value of information as it transfers across a project lifecycle.

*The Rosetta Stone was created in 196BC to translate between different languages and when it was rediscovered by archeologists it was key in deciphering Egyptian hieroglyphs.

What is it not?

CFIHOS is not cost plus. What CFIHOS specifies is a common language and structure to turn over information that already exists in EPC systems.

It is not above and beyond what we have asked for before – this just elevates it from PDF to true data.



CFIHOS for You

How does it add value?

- CFIHOS will change the way major capital and regional projects facilitate and manage their digital data.
- Improves the speed, quality, and consistency of your design; reducing change in the field.
- Increases data quality and completeness for your operations; enabling flagship assets of the future.
- Common language allows computers to do what computers do best; and allows our engineers to focus time where critical thinking and technical expertise are needed (e.g. automate and centralize surveillance).

What does it take to implement?

- Standardized implementation and centralized support.
- Engineering culture shift to leverage data.

What is our ask?

- That you help us develop the standard by getting involved in working groups.
- That you help us decide what is included in the standard by voting to approve or reject suggested features in the standard.



CFIHOS Elements

Technical Specification Document

Requirements, rules and principles for information handover



Data Model

For structuring data and documents about assets



Process & Guidance Documents

Outlining implementation steps (and do's & don'ts)



Reference Data Library (Dictionary)

Consistent naming of equipment, properties & documents





CFIHOS V1.5 Standard Documents

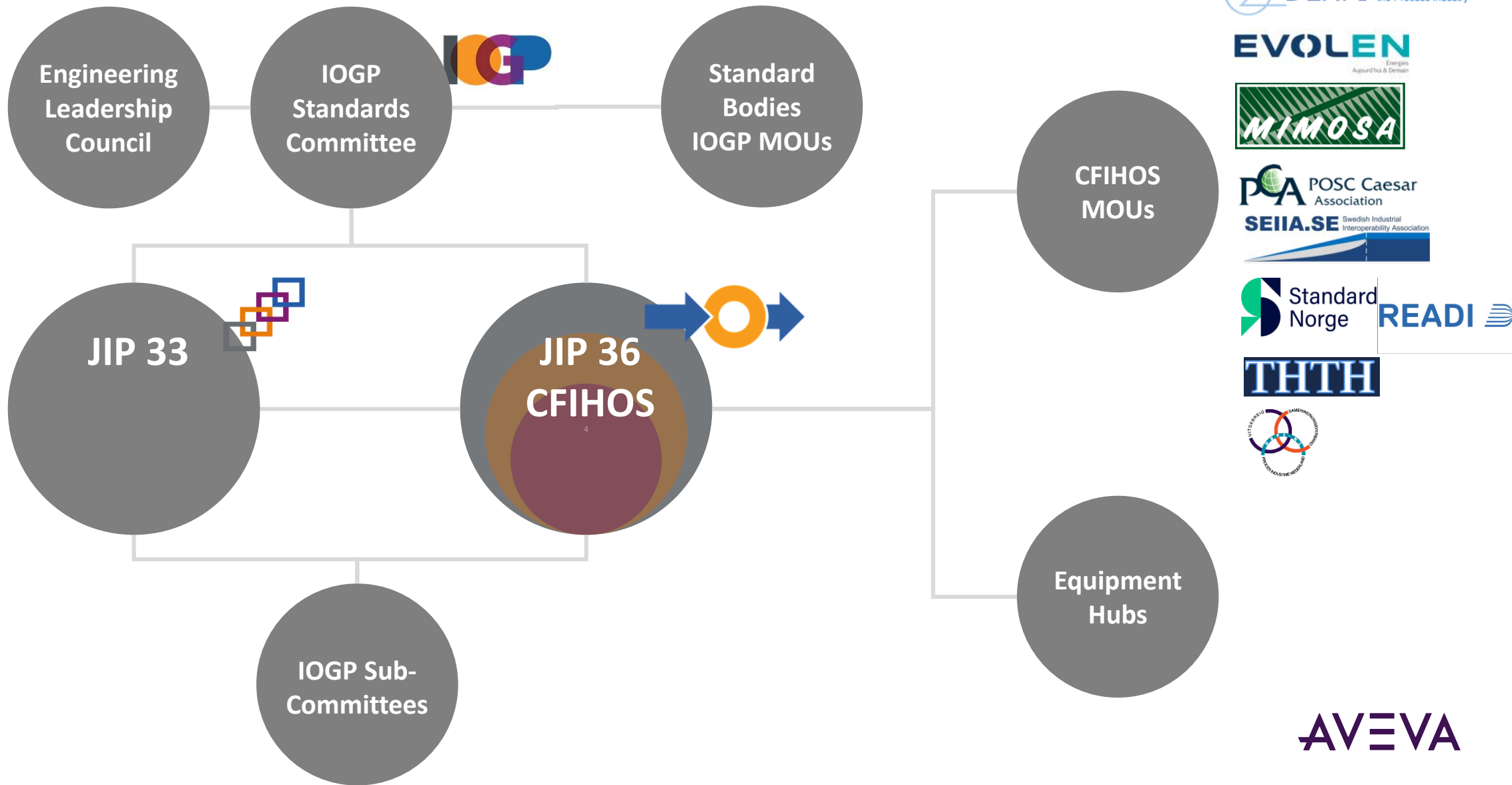
CFIHOS V1.5 can be found on the CFIHOS Website. This version is considered to be the minimum viable product that can be successfully implemented either in parts or in its entirety.

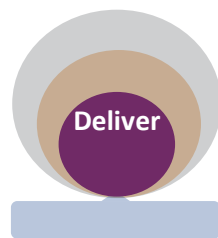
CFIHOS Standard Documents

Narrative Documents	Download Link
Scope and Procedures (C-TP-001) (V.1.5)	CFIHOS Scope and Procedures
Specification Document (C-SP-001) (V.1.5)	CFIHOS Specification Document
Implementation Guide for Principal (C-GD-001) (V.1.5)	CFIHOS Implementation Guide for Principal
Implementation Guide for Contractor (C-GD-002) (V.1.5)	CFIHOS Implementation Guide for Contractor
Reference Data Library	
Reference Data Library (C-ST-001) - Excel version	Reference Data Library (Excel version)
Reference Data Library (C-ST-001) - CSV zip file	Reference Data Library (csv zip file)
Data Model	
Using the Data Model (C-DM-001)	Using the Data Model
Data Dictionary (C-DM-002) - Full version (V.1.5)	Data dictionary (full version)
Data Dictionary (C-DM-002) - Light version (V.1.5)	Data dictionary (light version)
Supporting Templates	
v.1.5 CFIHOS Contract Scenario Templates	CFIHOS Contract Scenario Templates

- We will continue to develop and improve the content through point releases as we work towards our next version.

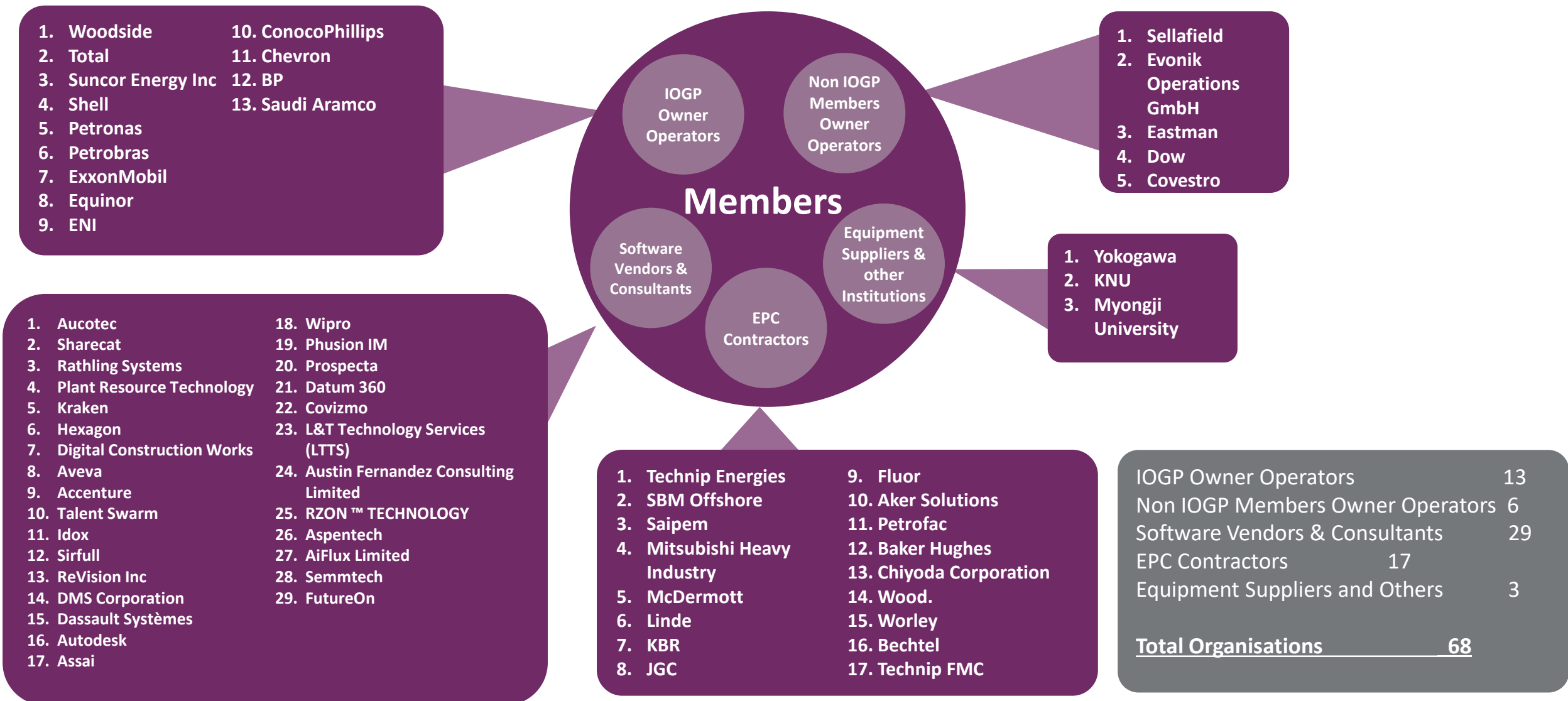
CFIHOS in the Wider Context





Current CFIHOS Membership (as of March 2022)

Participation has grown to 68 organizations across multiple industry sectors, with 370+ Individual members.





CFIHOS Working Groups

Open to the entire membership

WG Name	Lead	Deputy	Scope
Reference Data Library			Develop and maintain the content of the Reference Data Library (Classes and Properties) and implement any new feature requests that affect it as the result of Change Requests.
Documents			Enhance the portion of the data model and RDL describing documentation requirements, and how it relates to equipment and tag classes. Team meetings re-established
Data Model			Develop and evolve a logical data model, depicting the concepts of interest to CFIHOS, how they are defined, and what business rules they must obey.
Implementation			Team scope in transition from narrative documents maintenance to a focus on training and implementation support.
Software	Steve Parvin		Develop and define a broad and flexible framework that enables software organisations to demonstrate compliance with the CFIHOS standard – for all the elements of the standard and across the supply chain.
Marketing			Communicate to prospective (and current) CFIHOS members to educate them about the standard, encourage its adoption and foster participation in development. Ensure widespread knowledge about and support for CFIHOS within stakeholder organisations – not just members but ALL organisations in the supply chain where the standards apply.
Digitalisation			Keep up to date on what is going on within digitalization happening in oil and gas and other industries. Coordinate with Industry Digitalization Roadmap task force within ISSC and CFIHOS. Develop a digitalization roadmap for CFIHOS, in years to come

CFIHOS V1.5 Deliverables (Open Source)

<https://www.jip36-cfihos.org/cfihos-standards/>

- CFIHOS v1.5 Release Notes

Narrative Documents:

- Scope and Procedure (C-TP-001) (V1.5)
- Specification Document (C-SP-001) (V1.5)
- Implementation Guide for Principal (C-GD-001) (V1.5)
- Implementation Guide for Contractor (C-GD-002) (V1.5)

Reference Data Library (RDL):

- Reference Data Library (C-ST-001) - Excel version
- Reference Data Library (C-ST-001) – CSV zip file

Data Model:

- Using the Data Model (C-DM-001)
- Data Dictionary (C-DM-002) - Full Version (V1.5)
- Data Dictionary (C-DM-002) – Light Version (V1.5)

Supporting Templates:

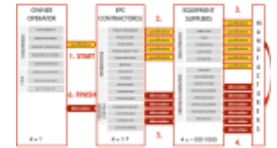
- V1.5 CFIHOS Contract Scenario Templates



CFIHOS

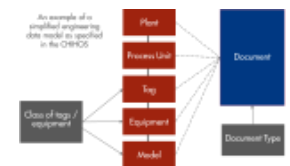
Project Execution

- **Interoperability:** Drive consistency through a common specification and dictionary from day 1 to reduce cost of consolidation of information at each step in the supply chain across the project.
- **Debottlenecking:** Raise productivity by applying the “theory of constraints” e.g. find bottlenecks in design review & approval process using status reporting on information delivery & review.
- **Accelerated handovers:** Continuously stage and validate asset data to assure data quality and accelerate population of operational systems to speed up the first oil date.



Operations

- **Speed up searches for information.** Reduce “search-time” by linking documents to tags (often quoted as 25% of operational staff time). Improve management of change for brownfield modifications.
- **Reduce operational risk.** Demonstrate control over “As Built” asset information. Use as a “minimum standard” for asset information. Use as a specification for integrated service contractors & data cleaning.



	Annual frequency	Minor	Small	Medium	Very serious
Date	10000	10000	10000	10000	10000
Frequency	10 to 100	1000	10000	100000	1000000
Library	10 to 100	1000	10000	100000	1000000
Process	0.01 to 0.1	100	1000	10000	100000
Quality	0.001 to 0.01	100	1000	10000	100000
Material	<0.001	100	1000	10000	100000



CFIHOS



International Association of Oil and Gas Producers (IOGP)

- CFIHOS / Joint Industry Programme 36 (JIP 36) – Making information handover quicker, easier and safer for operators, contractors, equipment manufacturers and suppliers by using standardized specifications

<https://www.jip36-cfihos.org/>

- AVEVA recommends that our customers consider joining CFIHOS
 - Peter Townson pt@iogp.org
CFIHOS (JIP36) Project Director
City Tower, Level 14
40 Basinghall Street
London EC2V 5DE, United Kingdom
Tel : +44 20 3763 9700

<https://www.iogp.org/about-us/contact-us/>

AVEVA[™]



Standardizing Procurement Specifications



International Association of Oil and Gas Producers (IOGP)

- Joint Industry Programme 33 (JIP 33) – Standardizing Procurement Specifications
 - <https://www.iogp-jip33.org/>
 - Making a step-change improvement in the specification, procurement and delivery of equipment for the capital facilities industry, through the use of standardized industry procurement specifications.

Questions

Information Governance

Managing Information Standards as an Asset

AVEVA

Managing Asset Information Management – Information Standards

As an Asset

Contract, Specifications, Standards



Excel Spreadsheets

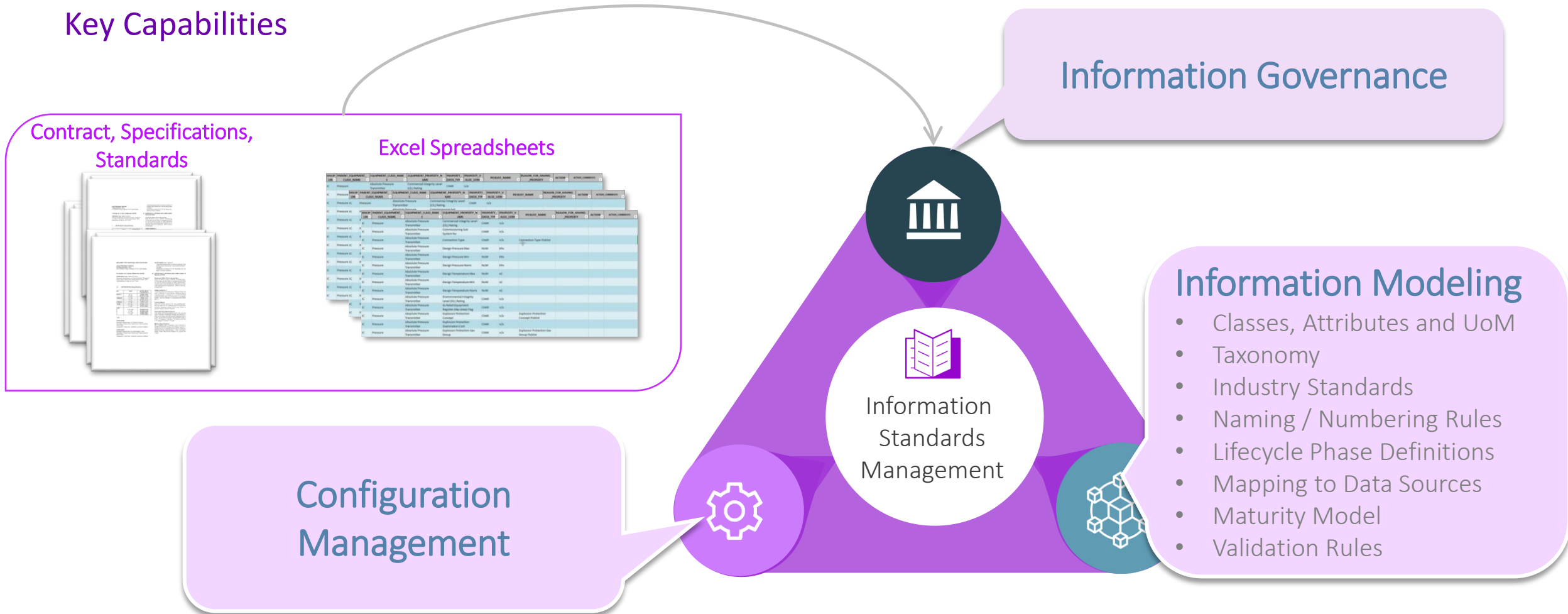


ITEM	ITEM NAME	ITEM CODE	ITEM TYPE	ITEM STATUS	ITEM VALUE	ITEM UNIT	ITEM QUANTITY	ITEM DATE	ITEM LOCATION
ITEM 1	ITEM 1 NAME	ITEM 1 CODE	ITEM 1 TYPE	ITEM 1 STATUS	ITEM 1 VALUE	ITEM 1 UNIT	ITEM 1 QUANTITY	ITEM 1 DATE	ITEM 1 LOCATION
ITEM 2	ITEM 2 NAME	ITEM 2 CODE	ITEM 2 TYPE	ITEM 2 STATUS	ITEM 2 VALUE	ITEM 2 UNIT	ITEM 2 QUANTITY	ITEM 2 DATE	ITEM 2 LOCATION
ITEM 3	ITEM 3 NAME	ITEM 3 CODE	ITEM 3 TYPE	ITEM 3 STATUS	ITEM 3 VALUE	ITEM 3 UNIT	ITEM 3 QUANTITY	ITEM 3 DATE	ITEM 3 LOCATION
ITEM 4	ITEM 4 NAME	ITEM 4 CODE	ITEM 4 TYPE	ITEM 4 STATUS	ITEM 4 VALUE	ITEM 4 UNIT	ITEM 4 QUANTITY	ITEM 4 DATE	ITEM 4 LOCATION
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ITEM 6	ITEM 6 NAME	ITEM 6 CODE	ITEM 6 TYPE	ITEM 6 STATUS	ITEM 6 VALUE	ITEM 6 UNIT	ITEM 6 QUANTITY	ITEM 6 DATE	ITEM 6 LOCATION
ITEM 7	ITEM 7 NAME	ITEM 7 CODE	ITEM 7 TYPE	ITEM 7 STATUS	ITEM 7 VALUE	ITEM 7 UNIT	ITEM 7 QUANTITY	ITEM 7 DATE	ITEM 7 LOCATION
ITEM 8	ITEM 8 NAME	ITEM 8 CODE	ITEM 8 TYPE	ITEM 8 STATUS	ITEM 8 VALUE	ITEM 8 UNIT	ITEM 8 QUANTITY	ITEM 8 DATE	ITEM 8 LOCATION
ITEM 9	ITEM 9 NAME	ITEM 9 CODE	ITEM 9 TYPE	ITEM 9 STATUS	ITEM 9 VALUE	ITEM 9 UNIT	ITEM 9 QUANTITY	ITEM 9 DATE	ITEM 9 LOCATION
ITEM 10	ITEM 10 NAME	ITEM 10 CODE	ITEM 10 TYPE	ITEM 10 STATUS	ITEM 10 VALUE	ITEM 10 UNIT	ITEM 10 QUANTITY	ITEM 10 DATE	ITEM 10 LOCATION



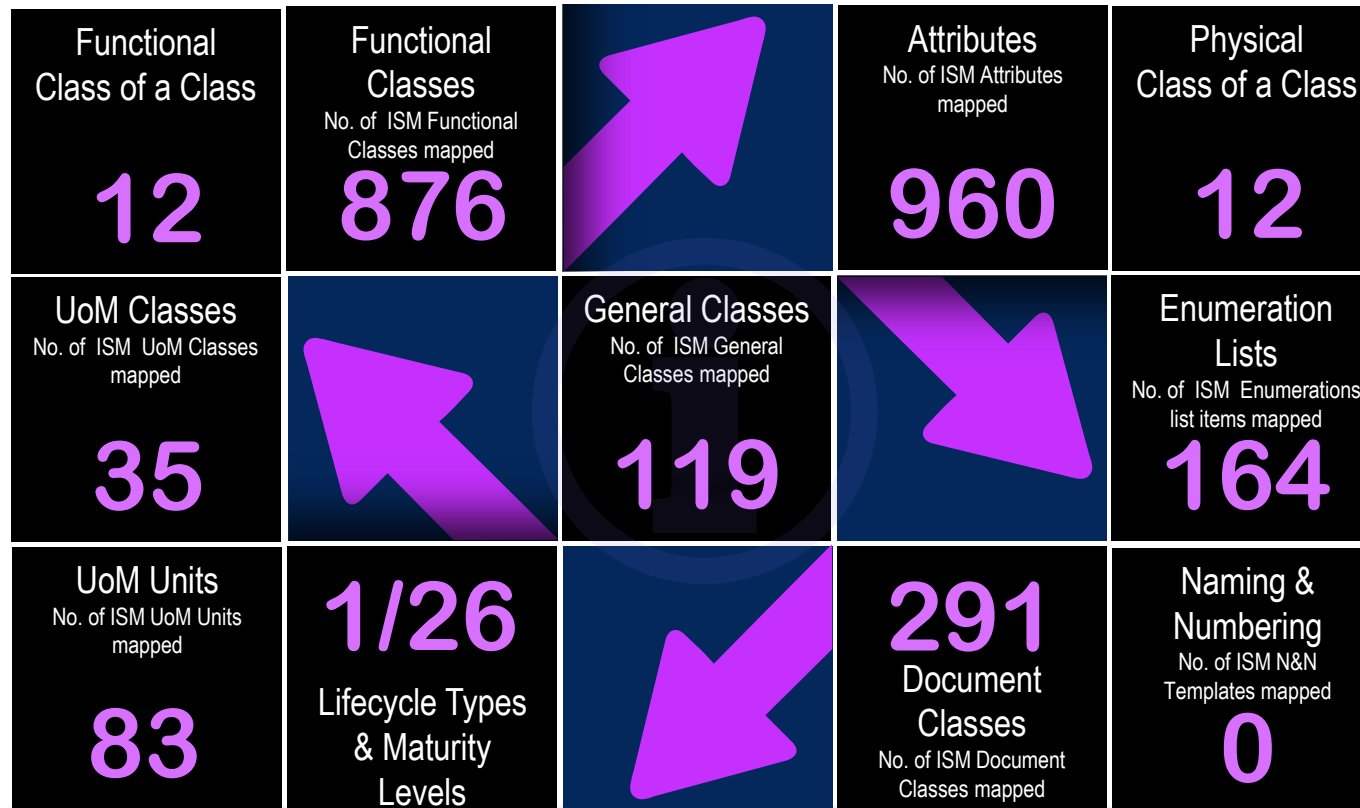
Information Standards Management

Key Capabilities



Capital Facilities Information HandOver Specification v1.5

Statistics



CFIHOS v1.5 is available in AVEVA ISM

<https://www.jip36-cfihos.org>

Capital Facilities Information HandOver Specification v1.5

Overview of CFIHOS v1.5 Updates

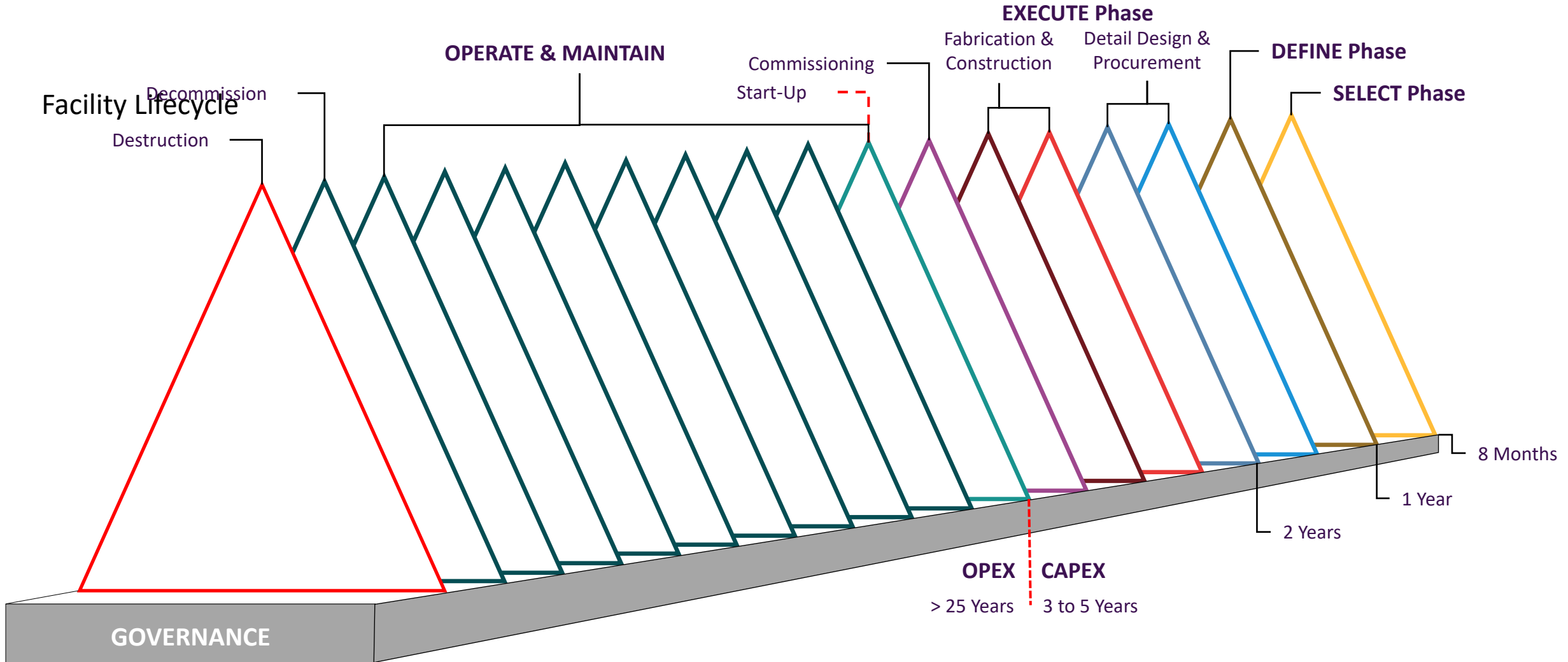
- **Function Class of a Class:** 12, there has been no change since the previous release of CFIHOS v1.4
- **Functional Classes:** 876, this represents an addition of 307 Functional Classes since the previous release of CFIHOS V1.4
- **Attributes:** 960, this represents an addition of 103 attributes since the previous release of CFIHOS v1.4
- **Physical Class of a Class:** 12, this represents an addition of 1 Physical Class of a Class since the previous release of CFIHOS V1.4
- **UoM Classes:** 35, there has been no change since the previous release of CFIHOS v1.4
- **General Classes:** 119, this represents an addition of 23 General Classes since the previous release of CFIHOS V1.4
- **Enumeration Lists:** 164, this represents an addition of 28 Enumeration Lists since the previous release of CFIHOS V1.4
- **UoM Units:** 92, this represents an addition of 9 UoM Units since the previous release of CFIHOS V1.4
- **Lifecycle Types & Maturity Levels:** 1 Lifecycle Type and 25 Maturity Levels, these are new elements to the latest release of CFIHOS v1.5
- **Document Classes:** 291, this represents an addition of 7 Document Classes (and 29 new Document Sub-Classes) since the previous release of CFIHOS V1.4 as well as the addition of 169 Document Sub-Classes
- **Naming & Numbering:** 0, there has been no change since the previous release of CFIHOS v1.4

Asset Information Management Strategy based on CFIHOS

AVEVA ISM, AVEVA Asset Information Management & AVEVA Change Manager

AVEVA

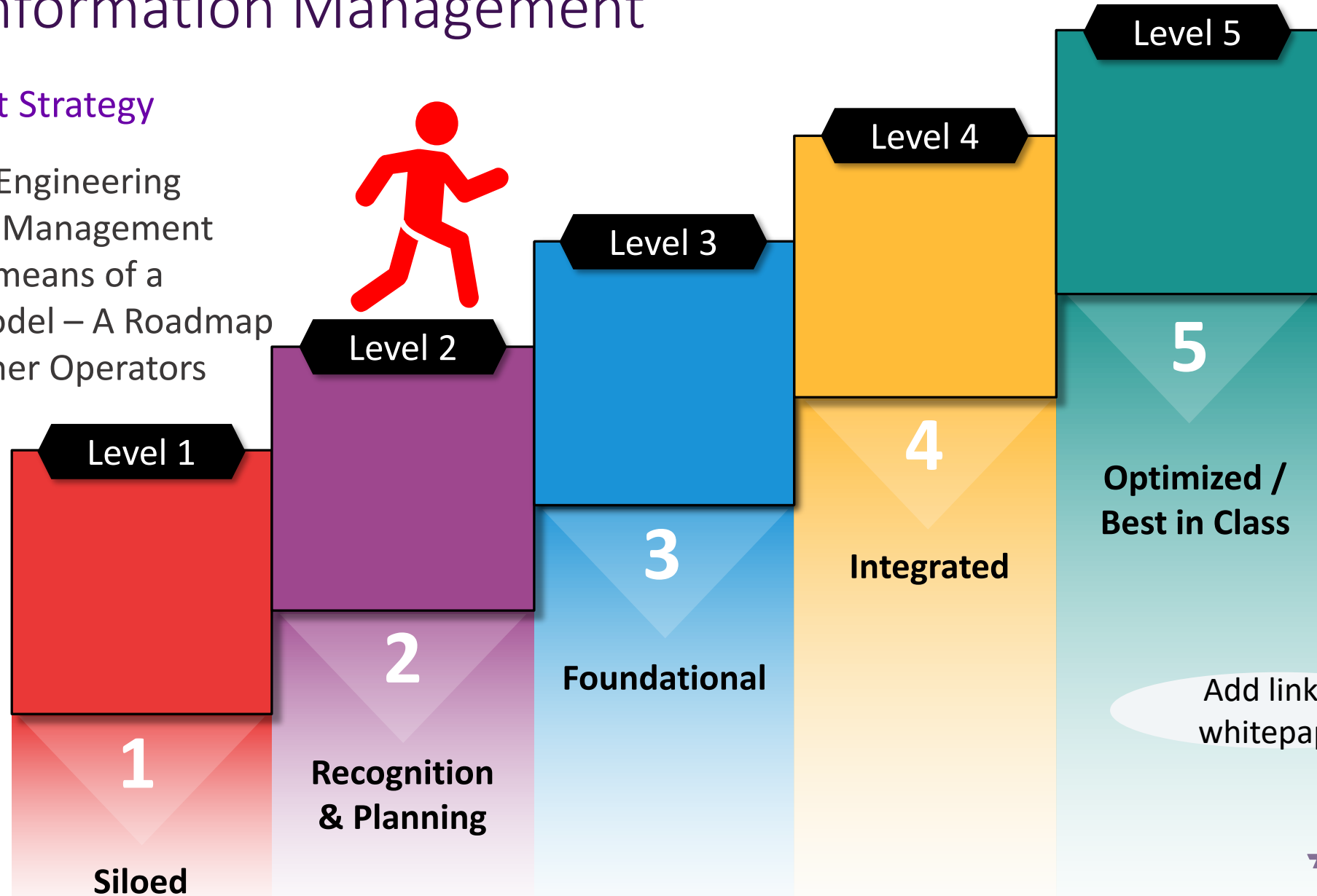
Asset Information Management



Asset Information Management

Digital Asset Strategy

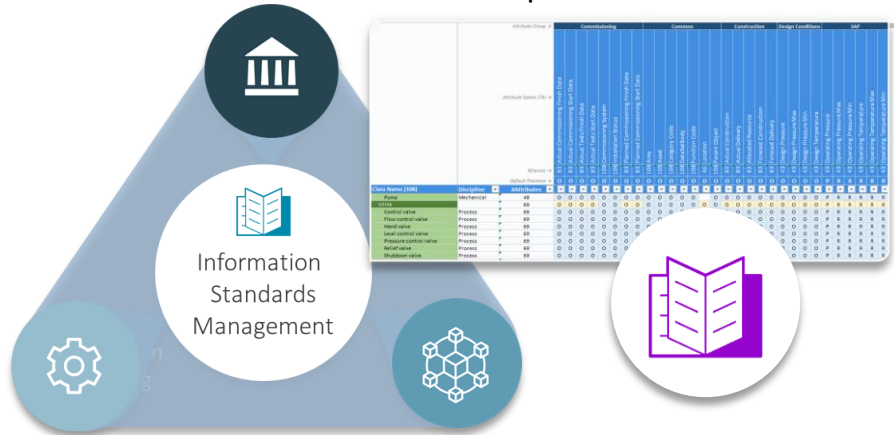
Defining an Engineering Information Management Strategy by means of a Maturity Model – A Roadmap Tool for Owner Operators



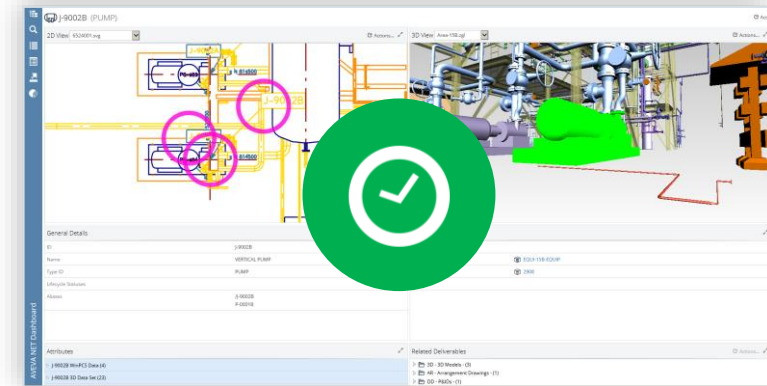
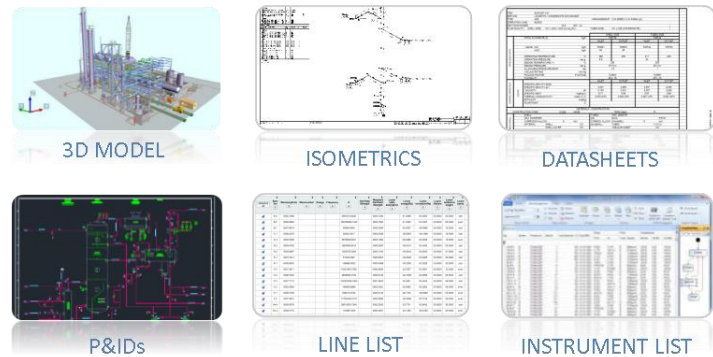
“Information Governance” is essential for higher Digital Maturity

Information Governance

Information Handover Specification

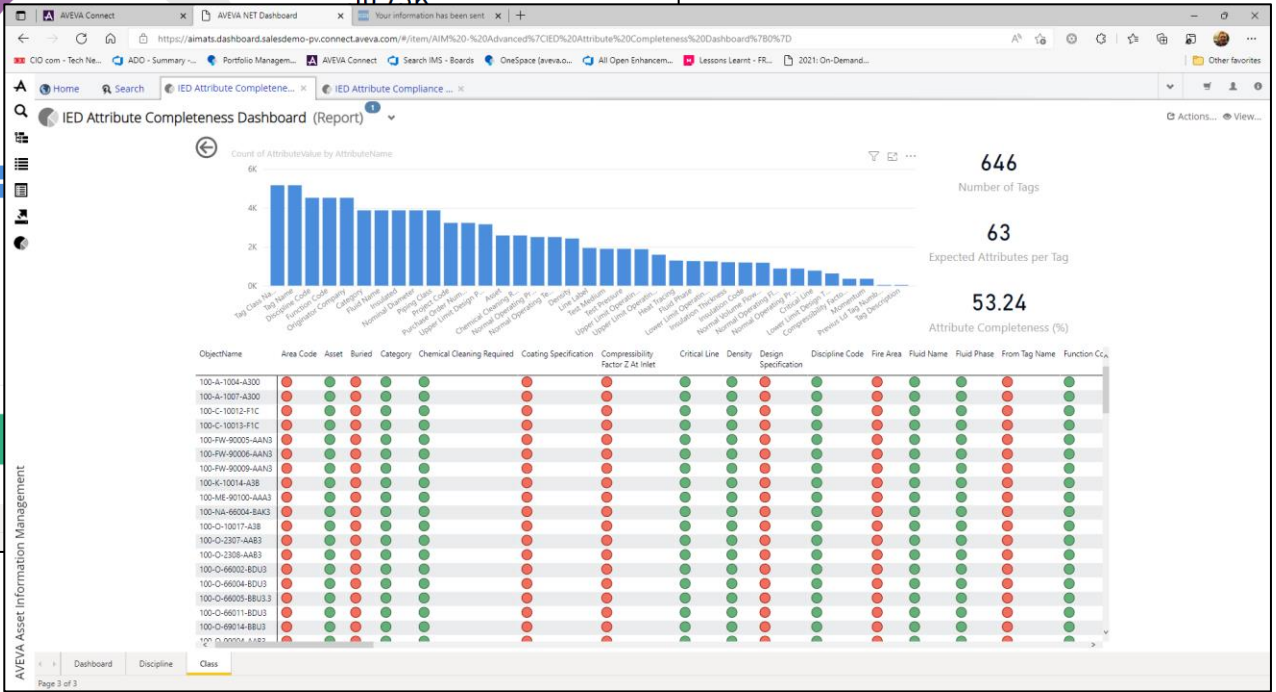
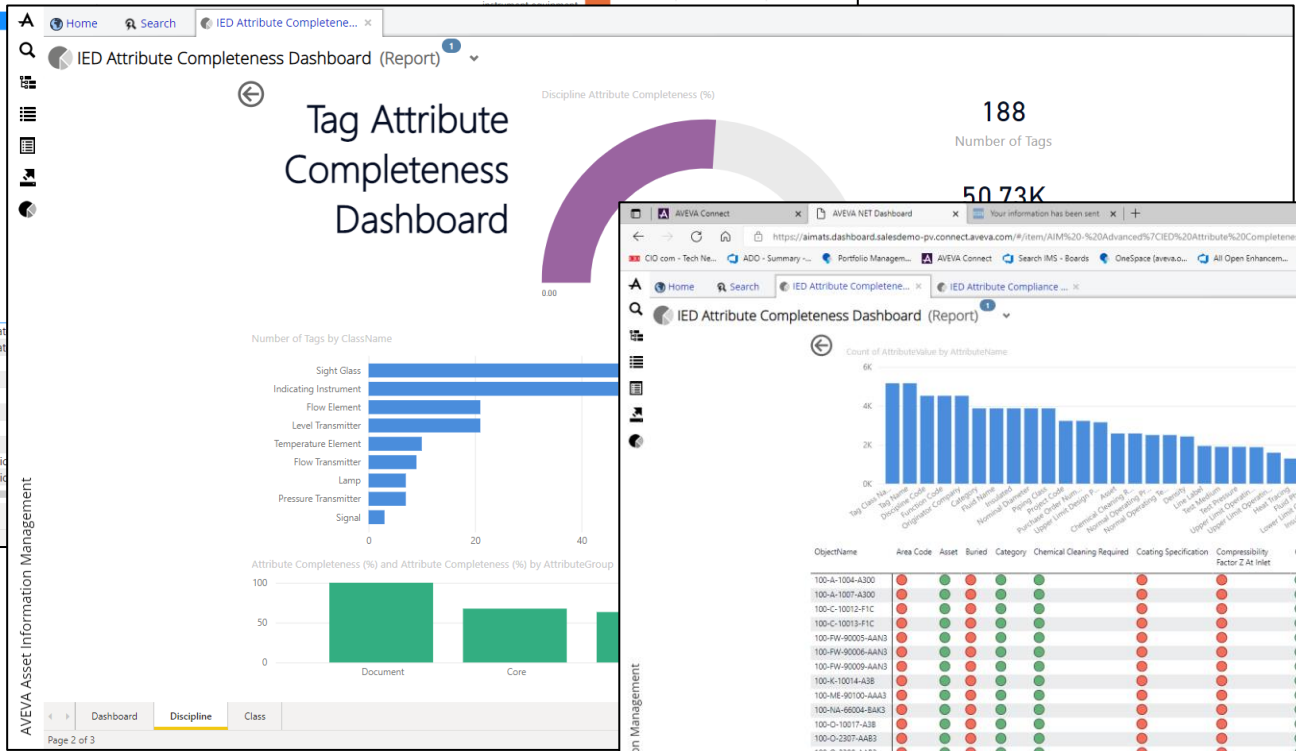
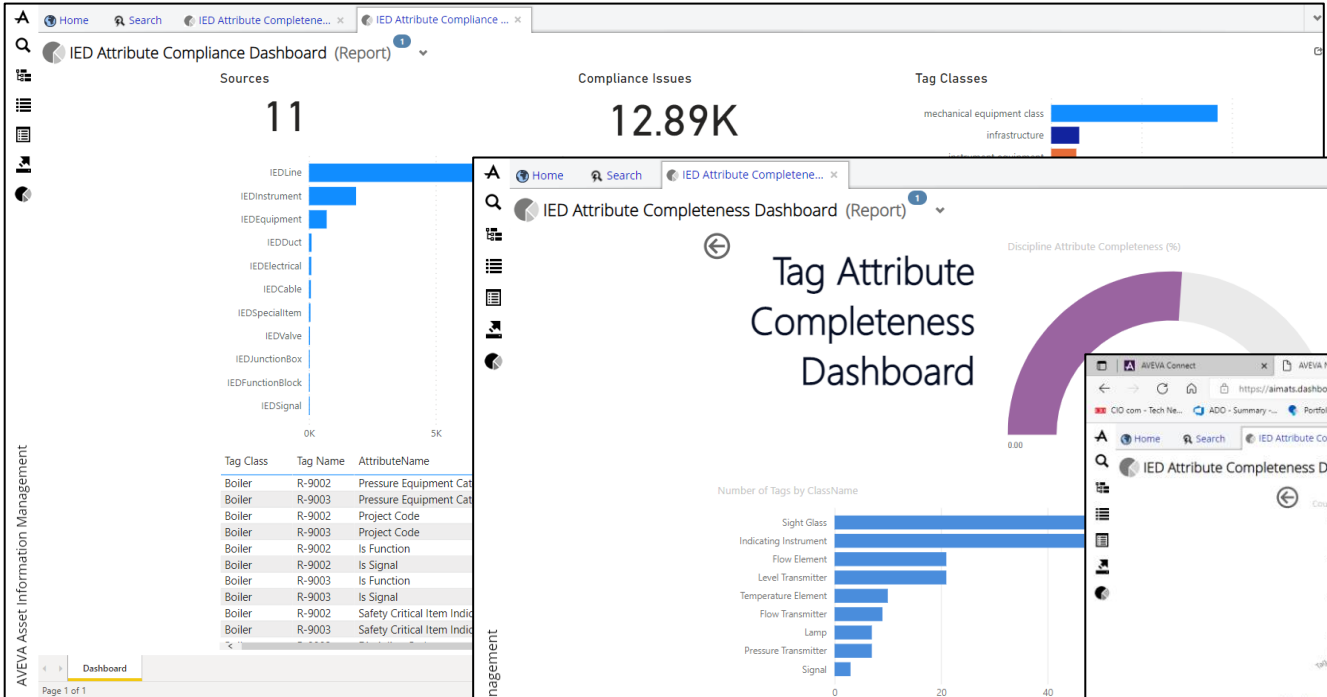


Digital Twin solution
(Trust and Verify)

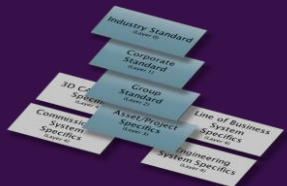


- ✓ Compliance
- ✓ Consistency
- ✓ Completeness





“Management of Change” is Essential for Sustaining Digital Twins



What are the benefits?

- Digital Twin to aggregate project deliverables
- Supports the project by providing:
 - Easy access to data and documents
 - Ability to identify data\document compliance, consistency and completeness
 - Early identification of gaps or issues with deliverables to allow for action
 - Measure of data readiness for key project activities
 - Mapping of data input sources and data destinations, supporting the Digital Thread
 - Management of change of data requirements through ISM
- Aggregated and aligned data to support a Digital Twin in operations



Steve Parvin

Engineering Information Management Portfolio Strategy

- AVEVA
- Steve.Parvin@aveva.com

Andy Davidson


AVEVA ISM and AVEVA Point Cloud Manager Product Manager


- AVEVA
- Andy.Davidson@aveva.com

DZIĘKUJĘ CI
 NGIYABONGA
 TEŞEKKÜR EDERİM
 DANKIE
 TERIMA KASIH
 СПАСИБО
 GRAZIE
 МАХАДСАНИД
 GO RAIBH MAITH AGAT
 БЛАГОДАРЯ
 GRACIAS
 ТИ БЛАГОДАРАМ
 TAK DANKE
 RAHMAT
 HATUR NUHUN
 PAKKA PÉR
 HATUR NUHUN
 PAKMAT CAĠA
 CÁM ƠN BẠN
 WAZVIITA
 FALEMINDERIT
 謝謝
 TAPADH LEIBH
 KEA LEBONHA
 БАЯРЛАЛАА
 MISAOTRA ANAO
 WHAKAWHETAI KOE
 DANKON TANK TAPADH LEAT
 SALAMAT
 MATUR NUWUN
 ХВАЛА ВАМ
 MULŢUMESC
 KÖSZÖNÖM
 ПAKMET CИЗГЕ
 고맙습니다
 GRAZIE
 SHUKRA
 HVALA
 FAAFETAİ
 ESKERRIK ASKO
 HVALA
 TEŞEKKÜR EDERİM
 OBRIGADO
 DANKJE
 EΥΧΑΡΙΣΤΩ
 GRATIAS TIBI
 АЧІЎ
 SALAMAT MAHALO IĀ 'ŌE
 TAKK SKALDU HA
 МЕРЦИ
 DI OU MÈSI
 ĎAKUJEM
 GRAZZI
 PAKKA PÉR
 SIPAS JI WERE
 TERIMA KASIH
 UA TSAUG RAU KOJ
 ТИ БЛАГОДАРАМ
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